The Amateur Computerist

"A large part of the success of Usenet is due to the fact that its admins. do *not* generally quash argument and unpopular opinion. This made it a crucible for testing ideas and opinions in one of the closest approaches to the 'marketplace of ideas' that has been seen in history."   Gregory G. Woodbury

Interview with Tom Truscott: On the Environment and Early Days of Usenet News

by Ronda Hauben
au329@cleveland.freenet.edu

[Editor's Note: Following is an edited interview by Ronda Hauben with Tom Truscott, one of the pioneers who created Usenet. It is based on an e-mail exchange.]

Ronda: *First can you say a little about your background and interests in computer science before you became involved in Usenet?*

Tom: As an undergraduate I got interested in writing a computer chess program. I don't play chess well but my chemistry lab partner did and so we undertook a multi-year project to write a chess program that could beat Bobby Fisher (my goal) or at least be able to beat a rank amateur (partner Bruce Wright's goal).

Table of Contents

Ronda: *How did you become interested in computer chess? You have said it wasn't that you were interested in chess itself.*

Tom: Well, I'm not sure. Here is rambling speculation. As a kid I did not read much, but some things caught my imagination. One was a short story, Danny *Dunn and the Homework Machine*. (I think Danny Dunn was a kid who invented all kinds of fun stuff.) I thought that this would be a neat machine to have. I realize it is a big leap from homework to chess playing, but somehow it makes sense to me....

My first chance to use a computer (an interactive BASIC system) was in a summer program between junior and senior years of high school. My first large program played checkers. It didn't play all that well, but it seemed to have potential. As a Duke freshman my chemistry lab partner was Bruce Wright, an excellent chess player.

I told him we could write a computer chess program that would beat Bobby Fisher.

He didn't think so, but we started writing the program anyway. I was interested because of the computing challenge and no doubt the fame that we would garner by defeating Fisher, and I guess Bruce was interested because he wanted to learn computing. We spent a LOT of time writing it, and we learned a lot about how not to write programs.

I guess one thing about computer game programs is that they are like robots S a somewhat autonomous thing.

At tournaments the program tells me what moves to make for it, asks me how much time it has left on the clock, stuff like that. And writing a software robot is a lot easier than building a real one. Why I (and other people) find robots fascinating is

beyond me, but there it is.

Ronda: *I have read some articles from the 1970s that describe how computer chess was understood as something important. Did you have that sense?*

Tom: Yes, and we had the incentive to believe that because computer chess was far too expensive to be a mere hobby. From a computational point of view, chess and checkers are remarkably similar problems. And the world's best checkers player is still a human. But just try asking Columbia (i.e. some university –Ed.) for plane tickets to a computer checkers tournament, or asking the Association of Computing Machinery (ACM) to spend thousands of dollars to host one!

But enough of this cynicism.

When computer chess, and more generally Artificial Intelligence (AI), were just starting out, no one knew what was going to happen. Computer games were (and are) like the drosophila fruit fly of AI because the problems are relatively simple, the rules are clear, there are plenty of human experts for comparison, and there are objective measures of "success." Many felt that breakthroughs in general AI would happen first in this simpler arena.

People still don't know what is going to happen. I guess there haven't been big breakthroughs, but there are a number of "lessons" from computer chess that are argued and/or used in the general AI context. One (controversial) lesson is that computers should not "think" by mimicking humans. Should planes fly by flapping their wings?

If nothing else, computer chess will make a significant dent in the human psyche when a computer decisively defeats the human world chess champion.

It is going to happen sure as Silicon Valley makes chips. And it will be like a tiny version of the moon landing. It will be something of a stunt, and not really that important, but it will have a symbolic impact that will change how people think.

Ronda: *Can you say what you did once you and Bruce Wright decided to write a championship chess program?*

Tom: I discovered that Claude Shannon had written a very early paper on how to construct a chess playing machine.[1] It was remarkably farsighted given the state

of computing then. The next oldest paper I found was from 1957 by someone who implemented a program similar to Shannon's proposal. It played terribly.

Our first computer chess tournament was the North American Computer Chess Championships, (CCC) held in November 1974 at the ACM Annual Conference in San Diego. (We competed in a local human tournament earlier that year.) Because ACM was sponsoring it I decided to become an ACM member (in April 1974, I was a junior by then) if only to see the announcements about the upcoming tournament. It was tough reading for an undergraduate but there were some interesting papers. A particularly interesting one appeared that year, about a time sharing system that ran on a PDP-11.[2] It sounded so much more sensible than the IBM MVT/TSO computer system that we were using. Simple things were simple, and yet one could do nifty things as well.

Ronda: *What was the Duke computer you wrote your first chess program for?*

Tom: It was an IBM System 370 Model 165, 80 nanosecond cycle time (12.5 MHZ in today's lingo), three megabytes of main memory (later upgraded to four megabytes for a mere $100,000). Pretty much the top of the line at the time. We did our development in batch mode (the source code was on punched cards and the compiled code was stored on disk) and used time-sharing option (TSO) when competing in tournaments.

Ronda: *What happened at the tournament?*

Tom: Bruce Wright and I called our program "Duchess". It did quite well, and it was there that I met Ken Thompson who also had a good chess program. His machine was running a background task sopping up idle CPU time by solving simple chess end games! (For example King and Rook vs. King). There was no chance we could do something like that on our mainframe which cost 20 cents per second. But on the other hand our three MIP mainframe was about the fastest there was, and could compute rings around a little PDP.

There were twelve teams competing in the tournament. We were on a stage in a large room with seating for spectators. Each team had a computer

terminal (something like a dot-matrix printer with a keyboard in front and an acoustic modem on the back). And a telephone. Boy were those phone calls expensive. But the ACM was picking up the tab, and Duke was giving us the computer time.

At the 1974 tournament, we knocked off MIT's "TECH-II" in the first round. They had come in second the previous year, and we were a newcomer, so that was something of an upset.

In the second round we got clobbered by the perennial champ, "CHESS 4.0" from Northwestern University.

In the third round we played Bell Labs' "Belle". (I think it was called "Tinker Belle" at one point.) I had met the author earlier, before the second round, when he showed me how good his program was at solving mating problems. I wasn't that interested in chess, but humored him while he pulled a chess position out of a library and had the program find a mate in 5 (or some such). I guess if I actually played chess I would have been impressed.

So when the third round began Bruce Wright and I were on one side of a table, and Ken Thompson and someone else from Bell Labs (who years later I realized was Brian Kernighan) were on the other side. I noticed that when Ken Thompson logged on, the Bell Labs computer printed:

"Chess tonight, please don't compute."

I mentioned that that was really neat to be able to get the computer center to put out a notice like that. He said something noncommital in response. So the game began. A few hours and a few thousand dollars later we really had "Belle" on the ropes. All it had left was a lone king and we were about to queen a pawn! But then our program ABENDed (core dumped) in a way that caused the phone line to drop. We dialed back in and set things up, same thing. Every so often it would actually make a move. But making the phone call was slow (we had to ask for an outside line from the hotel operator) and painful (rotary dial you know) and eventually our program lost on time.

Later, after the tournament, we concluded that the problem was not in our program. Rather it was a problem caused by TSO trying to load overlays from a partitioned MVT data set that had become excessively fragmented. Did I mention something earlier about simple things being simple? Thus was our mighty mainframe slain by a minicomputer. But I didn't realize it was UNIX.

Ronda: *What does 'losing on time' in chess mean?*

Tom: As is typical in human tournaments, each player has two hours to make their first 40 moves, and get an additional 30 minutes for each 10 moves after that. The games utilize a pair of clocks, one for each player. Whenever it is a given player's turn, their clock is ticking. If they use up two hours before completing 40 moves, they "lose on time". "Duchess" was intending to complete 40 moves in 1:40 (i.e. with 20 minutes to spare), but the program crashed so many times while trying to complete the last few moves that it ran out of time.

Ronda: *Can you describe what happened after the chess tournament? How did you get to work at Bell Labs in the Summer of 1979?*

Tom: Duchess competed in every ACM CCC from 1974 to 1980, but the next time I met Ken Thompson was at the 1976 UNIX Users Group meeting at Harvard. That was great fun. There were about 60 attendees. I was a grad student and we had just installed UNIX (Version 6) and somewhere along the way I made the connection between "Belle" and Thompson and UNIX. I was also at the 1978 UNIX Users Group meeting at Columbia University, and I think both Ken Thompson and Dennis Ritchie were there. Thompson also competed in the 1978 ACM CCC. I think he had some special chess hardware but it was no match for the much-improved mainframe programs.

Because of our mutual interests Thompson would even call up our computer at Duke from time to time, and "write" me. That was pretty intense, my trying to pick perfect sentences to send along to the genius at the other end. I think it was during one of those "write" sessions in early 1979, that he asked if I would be interested in a summer job.

Ronda: *What did you work on at Bell Labs when you worked there under Ken Thompson that summer?*

Tom: I remember making changes to the "ed" text editor command, and working on a global optimizer for C.

Ronda: *Can you say what it was like working at Bell*

Labs in the Summer of 1979?

Tom: Well, I fell into the following routine:

Woke up at 11 a.m. Got to Bell Labs at noon so I could play volleyball out on the front lawn with Mike Lesk and Steven Bourne and other folks. (After a few weeks the security folks told us they couldn't have a regulated monopoly running around loose like that.) Lunch at 1 p.m. in the Bell Labs restaurant. Ken Thompson and Dennis Ritchie and Greg Chesson were regulars. They had lunch at 1 p.m. because sometimes they didn't get to work until then (...)

Sometimes Dennis Ritchie would entertain us with a horror story about a non-UNIX system that he had to deal with recently. I think one day Ken Thompson explained the C-compiler Trojan-Horse hack he did. (It might have been in the lab, but lunch sounds right.) I thought it was cute but didn't recognize the larger implications. He later described it in his "Reflections on Trusting Trust" Turing Award paper (which was nicely written so I think Ritchie helped him with it). I tried to think of clever things to say, which was not an easy thing.

At 2 p.m. the day began, which involved doing pretty much whatever we wanted.

Richie was working on "Streams", I think. Ken Thompson was working on typesetting software but mostly working on a chess machine. (In 1980 he won the Third World Computer Chess Championship, defeating the "Duchess" chess program that I co-authored.)

Often at 7 p.m. a group would go out for dinner (they liked pizza). Occasionally someone would host dinner at their home. Afterwards I would go back to the labs and work until midnight. And the next day I would get up "at the crack of noon", as Thompson put it.

There was a kind of lull that summer because UNIX (Version 7) had just been wrapped up. That was the summer that the Seventh Edition of UNIX was sent out with lots of new software such as "sed", "awk", "uucp", and the Bourne shell. Ritchie did various paperwork and tape-making to get it out the door.

Ronda: *Was there any special work being done with UUCP during that summer at Bell Labs?*

Tom: I didn't pay much attention to UUCP that summer, though I did receive e-mail from other Bell Labs locations. Of course no e-mail came from the outside ϛ they didn't have UUCP yet. (I have a curious memory of Mark Horton sending me a letter, but that probably did not happen.) Anyway I was too smug to pay much attention to other Bell Labs sites. After all I was at the very root of UNIX itself, hacking on the machine named "research" and eating pizza with Ken Thompson and Dennis Ritchie!

Of course when the summer was over and I was back at Duke, one of the first things I did was arrange a UUCP connection to "research". They called us nightly, which was great.

Ronda: *What was the origin of Usenet? Was there a Unix News program before you folks at Duke and University of North Carolina developed Netnews?*

Tom: I think the DEC PDP 11/70 there (at Bell Labs named "research") had a primitive "news" program that printed unread files found in the directory /usr/news.

But Duke already had a program (from one of the early user group tapes) that supported multiple "categories" of news. (I don't think the program was called "news" though), so I wasn't impressed.

In the UNIX (Version 7) manual set there were two papers on UUCP. One was "A Dial-Up Network of UNIX™ Systems" by D. A. Nowitz and M.E. Lesk, August 1978. The other was "UUCP Implementation Description" by D. A. Nowitz, October 1978. (UNIX V7 didn't ship until the summer of 1979 though.). So I have always thought of Dan Nowitz as a principal author of UUCP. It is odd that in a recent USENIX *;Login:* I think I saw Mike Lesk but NOT Nowitz being given some recognition for UUCP.

Ronda: *Did you continue to play computer chess after you and the other folks at the University of North Carolina and Duke created Usenet?*

Tom: In 1980 we competed in the Third World Computer Chess Championship held in Linz, Austria. Ken and Joe Condon (a researcher at Bell Labs) had completed their hardware chess machine and snagged first place. (From then on, hardware chess machines have dominated the championships. The flexibility of software programs has not been enough

to overcome the raw speed of chess hardware.)

"Duchess" came in second (or maybe third, I forget).

Claude Shannon was in attendance, and even handed out the trophies at the awards ceremony.

Afterwards we all went over to a TV studio to watch a West German TV special on computer chess and the championship. Claude Shannon and his wife were very engaging people. Someone took a photo of all of us, I have a copy buried somewhere.[3]

Ronda: *What happened when you got back to Duke in Fall 1979? Did you keep in contact with folks from Bell Labs?*

Tom: When I got back to Duke I set up UUCP, and Thompson also called in from time to time.

We really didn't get much software updating from them. Technically they should not supply it anyway, due to the various rules and regulations involved.

Ronda: *I wondered if anything happened at Bell Labs over the summer that helped you to propose Usenet...*

Tom: Not really.

Ronda: *Can you say what it was that led you or you and Jim Ellis to conceive of Usenet?*

Tom: Well, here is some text I wrote about that a few months ago:

"I think there was a confluence of things in fall 1979 that brought it about.

1. Jim had installed the latest UNIX (Version 7) which broke many old programs including a public domain "news" program that had been sent out on one of the early UNIX User Group tapes. (In summer 1979 the user group was renamed USENIX to avoid trademark problems.) [It was earlier than that, but the first new meeting was summer 1979] I don't think the program was called "news" (perhaps it was called "items"). I think it allowed items to be entered under one of several "categories". It had a number of problems (including a 512 byte limit per item), so we were thinking about writing a completely new program. Then we could contribute it to the next user group tape and hopefully achieve some minor level of fame.

2. I had worked for Ken Thompson at Bell Labs in the summer of 1979 and was in UNIX heaven the whole time. I also attended the summer 1979 USENIX conference in Toronto. Returning to Duke in the fall meant the end of that. Our only connection with the outside UNIX world was the user group newsletter *;Login:*, but we had not seen one in a while. It was published on an erratic schedule by a professor [Mel Ferentz] who had a lot of other demands on his time. We were quite nervous that should anything happen to him this tenuous connection would be lost entirely.

3. UNIX (Version 7) came with UUCP. This complex (for its day) program made it easy to send e-mail and files to other UNIX (Version 7) sites over phone lines provided that one end had an auto-dialing telephone and modem and the other an auto-answering telephone and modem. The Duke Computer Science PDP 11/70 had both."

(We built the auto-dialers ourselves. An interesting story ...)

We were using UUCP to contact two other UNIX machines at Duke and also one at UNC.-Chapel Hill.

So one night Jim and I had a rambling conversation about these things and the idea behind Usenet just popped out.

We held a few meetings to figure out the details. Two other local UNIX enthusiasts also attended: Dennis Rockwell from Duke and Steven Bellovin from UNC. We decided on the transfer format (what an article would look like on the wire) and on the basic functionality of the software. Steven Bellovin implemented this stuff with shell scripts as proof of concept. It was impressively slow, but it worked!

We also decided on terminology such as "newsgroups". We probably chose that due to the newsletter analogy. This was long before the PC and "bulletin boards". We may have chosen incorrectly but it wasn't due to carelessness. One thing we didn't decide on was the name of the network. I think early on Jim coined "Usenet", but our first announcement did not use that (or any other) name.

An energetic new Duke graduate student, Stephen Daniel, also turned out to be a UNIX enthusiast. He created the dotted newsgroup structure that we know and love today, and wrote the first production version of news ("A-news").

Ronda: *Fred Brooks, who wrote* The Mythical Man Month *about the problems of creating large software projects was a Professor at the University of North Carolina. Did he do anything to help with Usenet?*

Tom: He was not involved in the early (or later) Usenet as far as I know. He did pay for a leased line between UNC and Duke that made communication via UUCP a "free good". But we really didn't seek faculty help for Usenet except for clerical issues such as handling long distance bills until we were reimbursed.

Ronda: *How did you present Usenet to people at USENIX in Winter of 1980?*

Tom: Jim Ellis presented a talk, but people did not come specifically to hear his talk. There was no pre-announcement of Usenet. We didn't even have a name for the thing. There were 400 attendees, no parallel sessions, and pretty much everyone heard everything. Ah, the good old days.

Ronda: *I have been told that the reason "A-news" was written is that the early shell script version of Usenet was too slow and tied up the computer science departments computer. Is that why the "A-news" version of Usenet was done to replace the shell script version?*

Tom: We never seriously considered implementing news as a shell script.

It did not tie up the Department computer. We did, however, have that problem with regard to UUCP. A grad student, Jothy Rosenburg, had a PDP/11 at Duke Student Health that ran UNIX. He used UUCP to ship files back and forth. The files got larger and larger tying up our phone lines (we only had two) and when he shipped a 500 Kbyte file which at 300 baud took 5 hours to transfer, some people indeed hit the roof.... Besides Jothy, people blamed the problem on people playing computer games. But I monitored phone use rather carefully and statistically game playing was a total non-problem. But people had their minds made up. This was in the fall of 1979 before news. News to UNC (and to phs) used fast leased lines which were not a problem. News elsewhere happened in the dead of night which again was not a problem. Usenet was being shipped via e-mail (not gateways of mailing lists) long before 1982.

Ronda: *Across the ARPAnet?*

Tom: I'm not sure, but it seems likely. Perhaps not across the country, but across the campus would be rather attractive. It ("A-news") had general support for non-uucp transports [like ARPAnet] in early 1980.

Ronda: *Do you have any idea how early in 1980?*

Tom: Quite early. Well before the Delaware USENIX Conference. The "uprop.n" paper (that was handed out at that conference) has a section on this I will include here:

"Remote systems can also subscribe to news-groups on an individual basis. For each such system a subscription list and a transmission protocol are maintained. Whenever an article should be sent to a remote system, the transmission protocol of that system is executed with a formatted version of the article as input. This program performs the necessary magic to send an article to the news program on the remote system. This might, for example, be done by remote execution or the article could be encapsulated and mailed to the remote system, when another program would recover it and pass it on to the local news program."

Ronda: *I wondered if there were technical limitations to the number and names of newsgroups under the original "A-news" program and then under the early versions of "B-news". I have been reading the discussion in "A-news" about forming new groups and wondered if there were constraints that had to be taken into account due to the software.*

Tom: The early documentation said that newsgroup names were restricted to 14 or fewer characters, but that was arbitrarily chosen. ("A-news" did not store articles in a newsgroup tree, so the old UNIX limitation of 14 character filenames did not apply here.)

There was no limit on the number of news-groups. However, rather than have individual .newsrc files, "A-news" stored each user's subscription list as a single line in the file /usr/spool/news/uindex. The maximum line was originally 200 bytes, which limits the number of explicitly requested newsgroups. On the other hand, one could subscribe to "all" to read

everything so this was not that big a deal at first. The "200" was also arbitrarily chosen, and was increased over time.

The real problem was the huge number of news articles. The software was very inefficient at processing articles (which would have been okay for three articles per day) and was painfully slow as a result of the traffic. There was also a naive assumption that the news program could allocate an array to hold all the news articles the user wanted to read (or otherwise process). But the PDP 11/70 did not have enough memory for more than about 1000 articles! So we hacked the program to deal with about 1000 articles at a time.

Ronda: *Do you remember the earliest means of keeping track of what newsgroups there were that people could subscribe to Ⴝ or did people just subscribe to all? I have noticed that someone posted a list of newsgroups in the early 1980s (maybe by 1982) I do not have the earliest posts so I wonder if such lists had been made earlier or if there was only a need for them at a certain point.*

Tom: Originally people could create a newsgroup just by submitting something to it, and similarly could subscribe to non-existent newsgroups. This got to be a problem because people would misspell newsgroup names. So we added a /usr/spool/news/ngfile which had a list of all the known newsgroups, and if someone submitted or subscribed to an unknown group they were warned and asked if they wanted to add it to ngfile. Newsgroup creation became a bigger deal in "B-news" which created actual directories for the various news-groups.

Ronda: *You have said that human-nets was an important newsgroup that was available in the early days of Usenet. Can you say what you felt was important about it and why it was called human-nets?*

Tom: "human-nets" was a discussion of the implications of world-wide ubiquitous networking. This network of the future was referred to as "Worldnet". It was a very interesting mailing list and possible only due to the ability of the network itself to permit those interested in this obscure subject to communicate.

Ronda: *What role do you feel Usenet has played in all of this?*

Tom: Usenet provided a good way to have online discussions, and so I think it (accidentally) played quite a large role in this. I think of personal e-mail, mailing lists, and news articles as differing in their purpose and audience, but not in their content or format. Stretching this further, we might view Web pages simply as "messages" over which unusual care has been lavished. And at the other end we might view "chat" style conversations as sequences of messages over which unusually little care has been lavished. Usenet just happened to find a sweet spot somewhere in the middle. Anyway, it seems reasonable that all these different kinds of messages could be formatted and handled in a more uniform manner.

Ronda: *Do you think we have succeeded in creating Worldnet?*

Tom: It is easy to say "no", because less than half the world's population have ever used a telephone, let alone a computer. We don't yet have ubiquitous networking. And yet almost all of the Worldnet vision has been implemented and is in widespread use. The Worldnet discussions were about creating online journals and creating an online storage of the world's knowledge. There were concerns about fairness (would minority viewpoints be suppressed?) and multi-culturalism (would we have a tyranny of the English language, or perhaps instead a Tower of Babel?). Well, the discussions have been overtaken by reality, and the concerns are no longer academic!

Notes

(1) The paper was Claude E. Shannon, "A Chess--Playing Machine", *Scientific American*, p. 48, February 1950.

(2) This was the July 1974 paper by Ritchie and Thompson on the Unix Time Sharing System that was published in the *Communications of the ACM* Number 17. (The earliest announcement perhaps of Unix to the world.)

(3) Reproduced in *Netizens: On the History and Impact of Usenet & the Internet* by Michael Hauben

and Ronda Hauben.

Editorial
Championing Usenet

In Fall 1992, the *Amateur Computerist* published a collection of articles about Usenet. By 1992,Usenet, which was born in Fall 1979, had grown and developed into a network and forum linking millions of computer users around the world. But few of those not on Usenet knew anything of its nature or existence. And many on Usenet had rarely taken the time to consider what they had become part of. The Fall 1992 *Amateur Computerist* collection of articles was one of the early acknowledgments that Usenet was something significant, and thus made it possible for those on Usenet or not yet on Usenet to pause and reflect on this important new development in human to human communication.

Since that time, the Internet has become a subject that has gripped the imagination of people around the world. E-mail, Usenet, IRC, Telnet, and FTP and now the World Wide Web (WWW) have become some of the uses of the Net that have enhanced communication among people, making our world smaller and more dynamic than ever before. However much of the press, at least in the U.S., is only charmed by the WWW, misrepresenting it as the Internet, and presenting electronic commerce (e-commerce) as the nature and future of the Net.

Meanwhile, hidden in general from public view, is the cooperative and dynamic form of communication that is the regenerative aspect of the Net. As networking visionaries Robert Taylor and J.C.R. Licklider pointed out, when people communicate in an active way, new ideas emerge. The development of a global network is but one of the products of this constructive interaction.

In 1961, in a speech given at an MIT conference about the future of the computer, British writer C. P. Snow noted that government officials would be making decisions that would affect the future of the computer. He cautioned against having those decisions made in secret by a small group of people who did not understand the nature of the computer. Instead, he urged that as broad a set of people as possible be involved in the discussion of the issues governments would need to resolve to plan for how the computer would be developed, so that the computer would benefit society.

In a similar way today, there is a need for such broad ranging discussion among many people. But today the issue is not merely the future of the computer, but the future of the Internet and of the computer as a new means of communication.

While small groups of government officials in the U.S., for example, are planning to replace the dynamic Net of the present with their model of a buying and selling bazaar from the past, other segments of the U.S. government and population recognize the importance of the Net as a new form of communication media.

Writing in the early 1960s, the German philosopher Jürgen Habermas explained why the ability to have discussion among people with diverse views which characterizes what we called "the public sphere." is so important.

Habermas explains the power of critical rational discussion and debate to determine the public interest on "the basis of which alone a rational agreement between publicly competing opinions could freely be reached." He describes different periods of history where such rational discussion by a sector of the population, was able to determine the important issues of the day.

In the U.S. federal district court decision in a case involving the Internet (ACLU versus Reno), one of the judges, Judge Stewart Dalzell, eloquently described the importance and power of Usenet and the Internet as a new media making possible a similar kind of democratic participation and discussion. He wrote: "The plaintiffs in these actions correctly describe the 'democratizing' effects of Internet communication: individual citizens of limited means can speak to a worldwide audience on issues of concern to them. Federalists and Anti-Federalists may debate the structure of their government nightly, but these debates occur in newsgroups and chat rooms rather than in pamphlets.... The Internet is a far more speech-enhancing medium than print, the village green, or the mails."

Judge Dalzell documents that there is a vibrant new form of public sphere developing online similar to that which Habermas described in other historical periods. Habermas' concept of the public sphere provides a way to recognize the democratic structures and the people who develop them as a crucial aspect of evolving social and political structures.

A new form of public sphere is being created as

the conditions and the actors develop with the ability and the need for the democratic processes and forms of the public sphere. And in a similar way, there are those interests trying to corrupt this newly forming public sphere.

This issue of the *Amateur Computerist* focuses on the capability of online technology, particularly Usenet, to encourage those who are online to contribute their news and views, to have diverse opinions aired and considered. This is a singular and special achievement that networking technology, particularly Usenet, makes possible. This is creating a new public sphere that promises to transform society in a way that can reflect the interests of a broader set of people than formerly and make possible a new form of democratic participation. Those who promote e-commerce as the future of the Internet, and the categorization of online users as "customers" of merchants of e-commerce, are trying to replace the dynamic democratic potential of the Internet with the old model of the citizen as passive actor of a commercially dominated society.

This is why we feel it is crucial to examine and explore the importance of discussion and debate and of uncensored posts that are carried on Usenet, both from its earliest days and in current newsgroups. We have taken this as our topic for this issue of the *Amateur Computerist.*

Many people over many long years have worked to make it possible for the communication that the Net makes possible to grow and flourish. Will the Net continue to grow and flourish as a significant new means of human to human communication? This is a crucial question for our times. We hope that this issue of the *Amateur Computerist* helps Netizens to answer this question in an ever more vital and active way.

Factsheet Five: ACN Vol 7 No 2

[Editors Note: *Factsheet Five* is a magazine which describes hundreds of Zines. Here is what it had to say about the *Amateur Computerist* vol. 7 no. 2 in its Winter 1997 issue.]

-The Amateur Computerist-

The *Amateur Computerist* is like the complete antitheses of *Wired* magazine. Look at its design simple two-column pages that are actually "readable", run off on an office xerox machine with a single corner staple. The other key difference is that *The Amateur Computerist* is a publication about computers, technology, and the Internet while *Wired* primarily focuses on business, marketing, and corporations. The best thing I can say about *The Amateur Computerist* is that it's for former or current *Wired* subscribers who are disgusted with its flag-waving corporate stance and are looking for something with an emphasis on real technology.

This thoughtful issue explores how the many facets of the Internet has transformed society. They cover everything from Usenet to e-mail to freenets to the Web. It starts off with a great piece that explores how online discussion forums like newsgroups are toppling the authoritative voice of newspapers. Another fabulous piece is Ronda's history of Usenet, covering how it grew out of a small group of researchers who wanted to exchange tips on implementing Unix. Other highlights include excerpts from the recent federal decision on the CDA, thoughts on online education, and the report from INET'96.

The Cooperative Nature of Usenet

by Gregory G. Woodbury
ggw@cds.duke.edu

[Editor's Note: In a thread in the newsgroup news.future, a poster in August 1993 wrote that he felt those on Usenet had a commitment to the anarchy that he felt characterized Usenet. In response Greg Woodbury, a Usenet pioneer who has been on Usenet since its earliest days, disagreed that one should characterize Usenet as an anarchy and wrote the following post describing his view of the organizational structure of Usenet.]

Postulating the concept of net.anarchy as being at the base of a belief system (or "faith") is an interesting twist on the topic. Part of the confusion arises, I think, from a misunderstanding of what is meant when folks call netnews an "anarchy."

The governance structure of the net (and there *is* one) does not (yet) have an "archy" word around to describe it. It is not an hierarchy, it is not an

oligarchy, it isn't an "aristocracy", nor do any of the other "archy" or "ocracy" words quite describe it. Since it cannot be put into a neat little category, it is lumped into the "not otherwise specified" category, which happens to be "anarchy."

As it stands, there is no good way to even describe the structures that do exist. They are distributed (as opposed to centralized), they are "consensual" (as opposed to majority rule), they are both individual and collective, and they are highly mutable/dynamic.

A few years ago there was some major discussion about the use of the term "organized" in relation to netnews. (Actually, in the application of the word organizations to Usenet/Netnews.) Such discussions arise periodically on the net, and serve to clarify the governance in the minds of those involved.

For other reasons, the use of the term "operational anarchy" in relation to netnews serves to remind those involved that we are involved in a co-operative situation, where the ultimate responsibility of the contents rests squarely on the poster of an article. Much of the arguments about netnews governance are attempts to avoid this basic fact. :-)

Another reason that "anarchy" continues to be applied is to remind folks that the site owners and their agents (the admin.) hold basic real property rights (in most places) to their machines that are used in providing this cooperative service, and that these rights are joined with concomitant real (i.e. legal) responsibilities.

Additional complications arise when the existing "laws" are applied to a situation that has far outpaced the ability of the "system" to keep up with it. One example is the application of "copyright" to the articles created by the posters.

Then comes the questions of how to "model" this dynamic system in such a way that a human can comprehend it and deal with it. Several different models may apply (simultaneously!) to it. The inability to choose a single, simple model further adds to the confusing (and thus anarchic) quality of netnews.

I can claim (with a bit of pride :-)) to have watched netnews/Usenet grow from its two-machine origin into three, then four, and then up its growth curve. The very basic assumption that people using the netnews software wanted to have interactive communication is still essentially unchallenged as the purpose for this "creature" we call netnews/Usenet to exist.

There *is* a quasi-religious quality about netnews in some of the arguments that occur, and it is quite possible that some folks are using a variety of faith postulates in their conceptions of it.

I, however, do not think that being an "anarchy" is one of those for most people. The term remains in use simply because there isn't any other term that can be applied to netnews instead.

There are, IMnsHO[1], a few folks who have made faith postulates out of the "advantages of democracy" and other concepts. :-)

Wolfe
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[1] IMnsHO := "In My (not so) Humble Opinion" a common net acronym.

[Editor's Note: The following is the second part of this article. The first part appeared in the *Amateur Computerist*, vol. 7 No. 2. A footnoted version is available from the author]

Creating Broadsides for Our Day Part 2

by Ronda Hauben
au329@cleveland.freenet.edu

V - Creating the Form for Usenet

The earliest days of Usenet demonstrate both the principles and practices in embryo of new and more democratic forms that this new technology makes possible. The issues developed in certain key newsgroups during this early period clarify the problems that a new communications medium bring to the fore. The model for Usenet that pioneers had early on was of an electronic newsletter. "Not to belittle any new newsgroup, but it strikes me that we are developing a real electronic newspaper here," wrote George Otto in a post in January 1982. "We already have a science section, an automotive section, a comic section, movie review column, sports section, travel section, book reviews, even want ads." Michael Shiloh noted that he enjoyed the network both "for entertainment and for receiving the latest news on many subjects," Another user pointed out that he didn't feel the news wires belonged on Usenet, "Although the news wire is something I want to see in Worldnet," he explained, " I don't want it on

Usenet, unless it belongs in one of the other newsgroups." J. C. Winterton explained that he didn't feel that Usenet "should become an arm of AP, Reuthers, etc." However, in considering what Usenet should make possible, one user at *allegra* at Bell Labs wrote, "Wouldn't it be great to use this electronic medium to send notes to our government officials. I never seem to write postal letters or telegrams," he admitted, "but we all seem to find these electric notes convenient enough to use often. Can you imagine net.reagan with a few authentic replies?" Another user added "or what if we could lobby our favorite senator (net.lobby, net.senator?)" In articulating the importance of Usenet, Mel Haas wrote that the effort had to be to "Try to make the net a useful exchange of useful information and ideas that will pay for the service and help people." Another user explained his view that Usenet "was supposed to represent electronic mail and bulletins among a group of professionals with a common interest, thus representing fast communication about important technological topics." S. McGeady noted, a bit in dismay, "We are running a networked democracy here." Observing that, "computer networks, news and mail systems are much closer to the 'broadsides' of yesterday, Alan Watt asked, "are they therefore protected under the free speech amendment?"

To make such communication possible, it was important that rapid replies be possible after the item was posted. "The problem of disjointed communications is very real," wrote Jerry Schwartz at *harpo,* "Frequently we receive the reply to an item before we receive the item." To help alleviate the confusion that might result from this situation, he recommended, "that people put a line or two at the beginning of their submission (like the head of this one) to indicate what they are replying to."

Such long delays in being able to respond to posts were problematic, "If Netnews is to be used for an interactive medium for discussion," wrote Mark Horton, "a reply could take over a week to get back, with a two week turnaround. Clearly, this is the worst case, and a delay of a few days is more likely than a week. But there would be a significant lag, and conversations would be way out of sync with each other." Horton noted that he was replying to a message that had been posted two weeks before.

The newsgroup net.news was created to discuss Usenet itself. In this newsgroup, users discussed changes that they felt could be made in the software to improve Usenet. For example, Chris (at *cincy*) noted that it was then necessary to save the news item one wanted to respond to, exit netnews to write one's reply, and then send it and return to Usenet. Instead, he proposed that a means of automatically replying be built into the netnews software.

Often proposals for how to improve Usenet were submitted online with requests for comments and discussion. However, when ARPAnet digests were read by those on Usenet, it was difficult to respond to the individual posts since the email address of the gateway to Usenet was given as the source of the digests, rather than the poster's e-mail. Several on Usenet discussed how this made it difficult to respond to the writer, and raised possible ways to remedy the problem. In response, Horton explained that he was beginning to think that a change should be made and the real sender listed. He asked for "Comments" on his proposed change.

Steve Bellovin, one of Usenet's creators, noted that he was one of the people who had created the old form. He welcomed making a change, and proposed generating a "Reply-to" field for the email address of the original author so that they would receive the response if one did "reply" with a lower case r but if one used an upper case R, the reply would be sent to Usenet as a follow up message.

In May 1981, Matt Glickman posting from the University of California Berkeley, announced that he and Mark Horton were working on a new version of the Netnews software used to transport Usenet. By July 1981, the software was going into the testing phase. Horton posted that "Comments on the conversion process are welcome."

In a similar way, in Nov. 1981, Horton proposed a policy for Usenet. He asked "If anyone objects to this policy, please let me know." Also Horton posted that he observed that people seemed to confuse Usenet with the UUCPnet that was used to transport Usenet. Therefore, Horton proposed, "I am toying with the idea of changing the names Usenet (the network itself) and Netnews (the collection of software that implement Netnews) both to "newsnet".

But he commented, "Since this is a sweeping change, and since I'm not God, I would like to see discussion on whether this is a good thing to do. Please reply to net.news." His request drew an immediate response. One such reply was from Bellovin. Bellovin wrote, "Mark, we picked 'Usenet'

in deliberate imitation of 'USENIX', (one of) the UNIX User's Groups. At the time, we hoped that it might become 'the official network' of USENIX."

Others suggested a variety of names, including WEB with the comment "unfortunately, sounds too much like a TV station."

Names like "Arachnet", "Arachne" and "Compuco" "meaning a computer conferencing" and "info-ex", i.e. short for information exchange, were proposed.

Bill Jollitz supported a suggestion by Lauren Weinstein on the need to be careful of names with existing trademarks. Both agreed that it was important to raise the issue of "how this net will grow." Though certain problems like those of a technical or political nature were "well handled in the forum of the network itself," they felt other problems should be discussed at USENIX, as "it's the only large forum appropriate at the time."

Other names suggested included "Thinknet" or "Idnet" as names to represent the need for intelligent discussion that was represented on the net. "And speaking of Web," another poster responded, if there were discussion on the subject it could turn into a "Dragnet."

Weinstein proposed that any renaming proposal be brought up at the January 1982 USENIX meeting because it was important to have a "reasoned consideration of any new name."

Another post indicated the user had searched through the Webster's dictionary using the Unix tool *grep* and listed all the words he found ending in "net."

In a post dated Nov. 22, Horton listed a set of possible names and asked for a vote. He wrote, "Usenet is the current name of the logical net of sites running the netnews programs. They make up an electronic distributed bulletin board." Horton submitted several policy issues as a proposal to Usenet. There was online discussion about these proposals. Several, however, commented that they would be attending the USENIX meeting in Santa Monica, California in January 1982 and asked that any policy wait till that meeting.

"I have gotten lots of pressure," Horton writes, "to let the people at USENIX make the decision (and for the network name, too) and I want to state for the record that while I fully hope to postpone all such decisions until at least USENIX, the people who can't make it to Santa Monica this January have just as much right to be heard as those who can.... I want to hear both groups, but the real public that counts here is the USERS OF THE NET (e.g. all you folks that are reading this.)"

Horton, however, proposed that votes wait till the USENIX meeting and be carried out in person, "since carrying out a discussion on this medium is very reasonable, but carrying out a vote is not, I suggest that we all air our opinions here and that after we talk ourselves out, those who can't make it to USENIX should find somebody who can and have them cast your vote by proxy. (Preferably someone you can talk with in person and hand a piece of paper to with your signature on it.)"

Agreeing that the policies should be discussed at USENIX, Brian Redman wrote "It's unfortunate indeed that more people can't be represented at our January meeting.... My suggestion that we wait 'till the meeting is in response to Mark's suggestion that we set some policies. I can't imagine that an actual vote by the readers could be carried out fairly," he cautioned, adding, "I for one would vote on behalf of all the integers in a VAX."

Others objected to having decisions made at USENIX rather than online. Among the objections were those raised by Greg Ordy from Case Western University (*cwruecmp*) who wrote, "I submit that if it takes an across the country meeting to settle the issues at hand, we are in big trouble.... It's the old loudest talker and prettiest face that sways opinions. I would think that this neutral medium would be an ideal place to judge only on content, not on packaging." He also noted that "the amount of non-technical news is starting to swamp the straight Unix stuff...." And he asked, "How much time does the average news reader/writer spend with news each day?"

Dave Curry also questioned relying on a USENIX meeting to make decisions on Usenet policy. He wrote, "I must say that putting the decisions on Usenet policy into the hands of those people attending the USENIX conference (certainly a minority of those who read news, etc.) is grossly unfair. I myself cannot afford to attend the conference (I don't know if I would, even if I could), and am certain numerous others aren't for numerous reasons. He proposed that, "the decisions should be made over the net." And he outlined a procedure to have those on the net involved in determining the decisions.

Horton's policy proposal had included a procedure to set up new newsgroups. Horton suggested a committee of those who knew how Usenet func-

tioned to make decisions on the names of new newsgroups. Others on Usenet commented on the proposed procedure. Jerry Schwartz at *harpo* disagreed, "Rather than a committee to determine the names of groups," he wrote, "I propose a group 'net.names'. The official procedure to create a new group would be to announce a proposed new group in 'net.general.' People interested in the group would reply via mail to the originator, and any objections to the name would be posted to 'net.names'. After a few days the originator can make a decision on the name and announce the creation of the group in 'net.general'. Any discussion of the changes to the names of existing groups could also go in 'net.news'."

Another response added, "I find it hard to believe that Mark is proposing a committee to approve of new newsgroups. Up to that point, his proposal sounds fine. How about just establishing rules for new groups." He detailed some proposed rules:

"1 - Send a request for interested parties to net.general

2 - Interested parties reply to the sender.

3 - If there is enough interest, replies are collected and sent out as the first transmission of the new group."

"This system," he commented, "seems simple and self policing. If there is enough interest for a group to be started, then it is no committee's business to say it shouldn't exist." And he added, "I even get the feeling that if there was a committee, it would really end up being a rubber stamp since who has the time to do the work necessary to come to a rational decision about a group? Or if the committee does turn a group down, the meta-discussion generated would probably be worse than any group I can think of. If someone violates the rules, I'm sure that they could be jumped on and their (illegal) newsgroup disallowed by the local administrator."

Alan Watt outlined the principles he felt were governing the creation and development of Usenet:

"1) Usenet is a strictly volunteer organization: nobody HAS to join, and guidelines cannot be enforced.

2) Any local news administrator has the de facto power to impose any kind of censorship technically feasible.

3) Systems will only participate in Usenet if the perceived benefits exceed the visible costs. Any guide-lines proposed ought to be guided by the principle of 'what is obviously for the common good that everyone will accept it once stated'."

He believed that "the character of Usenet will be the consensus of the individuals who maintain it at each local site, in spite of what any central committee requires or forbids."

From the discussion, he added, it appeared that in many cases "management isn't even aware that Usenet exists. The real danger," he continued, "is that if management doesn't know about Usenet, it follows that for most installations no one has an official responsibility to maintain it. This is certainly true for us." He continued, "Maintaining the news system on our single machine takes some measurable portion of my not-too-empty schedule each day. I squeeze out the necessary time because of perception (3)"

A post by Mel Haas added, "My personal hope is that the net will add to our capability to communicate, and do away with the horrible decisions that are made by committee meetings 'in secret' at some conference or other. I hope that all discussion of this (of censorship etc) or any other topic relating to the net is relayed to the net."

Jolitz said that he would report to those on the Net who couldn't attend the USENIX meeting about what went on. And Brian Redman responded that USENIX is "NOT a secret organization. BTW, Usenet was introduced at a USENIX meeting."

Another poster acknowledged that "most of the sites here at Bell Labs Indian Hill are running Netnews without benefit of super-user collaboration or even approval..."

VI - The Online Public Forum and Creating a New Form of Town Hall Democracy

Those online found themselves creating a new communication medium and a new communication environment. The discussion on early Usenet over policy proposals demonstrated an open process where people were encouraged to contribute. Issues and proposals were debated to determine the principles to guide the decisions made and the procedures adopted. In addition, this discussion raised the question of what parts of the democratic process can be carried out online versus what areas need face to

face meetings or other means of implementation. And how can these different forms interrelate? During the discussion of policy issues in the 1981-82 period, several people commented that they didn't trust votes carried out online, pointing out the ease with which votes could be tampered with in an online voting process. They also pointed to the discrepancy between the tentative vote carried out online about choosing a new name for Usenet and the vote held at the USENIX meeting where the vote for a new name for Usenet yielded very different results.

In a similar way, through online discussion and consideration, the new newsgroup naming and creation process was examined and a means found to create a working procedure, as opposed to depending on a proposed appointed committee to carry out the procedure.

In *The Rights of Man*, Tom Paine describes the importance of the discussion among people to determine the underlying principles upon which new forms can be fashioned. "Forms grow out of principles and operate to continue the principles they grow from," Paine observed. "It is impossible to practice a bad form on anything but a bad principle," he continued. Paine also proposed that the beginning of a new form is the most important and most difficult step, "as the probability is always greater against a thing beginning than of proceeding after it has begun."

The discussion made possible in net.news during this early period on Usenet demonstrates how problems can be examined to determine the crucial principles so as to set the foundation for a community or social compact. Before there are agreed upon principles and policies, the interests and desires of those who are joining together need to be explored and debated. The principles of any social compact need to be determined before the forms, so the forms that will serve these needs can be created.

The insistence of various participants on Usenet during this early period for input into the decisions about Usenet, echoed and articulated in Mark Horton's statement that "I'm not God," demonstrated the commitment that such decisions had to be determined by Net users. This was a statement of the fact that sovereignty resided in the users, not in any individual or organization.

This open process created a foundation upon which Usenet could expand and develop. Much that was only dreamt about or proposed as wishful thinking in 1981 on Usenet is now assumed procedure. Thomas Paine explains that if the principles determining a new form are good principles, the form will reflect and spread the good principles, and vice versa. The democratic process developed by those who formed Usenet, established the foundation for it to grow and flourish. In *The Rights of Man*, Paine describes his observations when he left Great Britain and came to the U.S. He found a new form had been created in the new world of America to guide how governments could function. In a similar way, the discussion on Usenet during its early days shows how a new form was created to guide the development of the online community. Studying these early efforts of the Usenet pioneers shows how they gave the world a new communication media and a new form of online town hall democracy.

[Editor's Note: In the following written in 1994, by ARPAnet pioneer Keith Lynch recalling his early days online and comments on some of the challenges to the future of the Net.]

History of the Net is Important
by Keith F. Lynch
kfl@clark.net

Well, originally it was just "The ARPAnet". In 1977 friends introduced me to it. We used a TI [Texas Instrument] Silent 700 terminal. This was a printing terminal which used thermal paper and built-in 300 baud acoustic coupled modem. One would dial a local "TIP". For instance there was one at Mitre, a nearby company. One would then type "@L 134" to connect to host 134, or whatever. There was no TIP (later TAC) login at that time. Host numbers were always a single number of up to three digits. No dots. Host names were always short and uppercase, and also had no dots.

A TIP was a machine which did nothing except allow dial-up users to connect to other machines. Later they were renamed TACs. There was no security on them. Not only was no password needed, but you could issue commands to other sessions on the TAC! Everyone was expecting that TAC login was imminent, but it wasn't installed for a long time. Not until 1986, I think.

I've heard of guest users being asked not to use a TAC because all its lines were busy – who resolved the problem by paying for an extra phone line and modem to be installed at the TAC!

TACs had some little-known features, for instance a way to link to a user dialed into another TAC, so you can have a real-time conversation without connecting to a computer. This was handy during hours when guest users weren't allowed to log in on the ITS systems at MIT. If you were both good typists, you could disable echo, so that when either of you typed, only the person not typing saw it. Which meant you could both type at the same time without stepping on each other.

A couple times, I would dial into a TAC from a printing terminal at work, and just leave it dialed in. Then, from home, I would tell that TAC port to connect to an ITS machine. Then, I would get on ITS from home and link to the newly appeared job, log it in, and have it list various files, so that they would print out at work for me.

One time I dialed into a TAC from a microcomputer running CP/M at work. (CP/M was a very simple OS for eight bit micros, before the 16 bit IBM PC and MS/DOS came out. It didn't even support hard disks, or tree structured directories.) Then I could connect to it via the net from home. I told my net-friends that we had a machine on the net at work. A machine running CP/M. I showed them how to connect to it, and they did so. This was considered a great lark. I can't easily convey how ridiculous the idea of a small machine on the net was in those days. I think this was in 1981 or 1982, when connection required a government contract and a refrigerator-sized quarter million dollar IMP.

The most popular machines on the net were the ITS machines at MIT. There was DM (77), AI (134), ML (198), and MC (236). DM had Zork on it. Zork was a text-only adventure game played in woods, caverns, dungeons, etc, which contained treasure to be brought back. (Infocom later marketed a modified version of Zork for various micros.) MC had Macsyma, a program for solving equations. (Macsyma was later marketed by Symbolics.) All machines had EMACS, the screen editor written by Richard M. Stallman et al, which gave rise to the later commercial EMACS written and marketed by Gosling, and the GNU EMACS again written by Richard M. Stallman, who later won a MacArthur foundation quarter million dollar genius grant for it and for related work. The ITS EMACS was the original EMACS, and was written in TECO, a character-based editing language.

ITS stood for the Incompatible Time-sharing System, an obvious take-off on CTSS, the Compatible Time-Sharing System. (Just as Unix is a take-off on the earlier TENEX, TWENEX, and MULTICS.)

All four ITS machines also had UNTALK, a split-screen conferencing program similar to the later "talk" on Unix and PHONE on VMS. I was told it was written by a user whose ITS username was UNCOLA and who had committed suicide. I don't know if it was the first program of that type, but it was the first I had seen.

ITS was a strange operating system. Commands took effect without one's needing to type <CR>. There was a semi-hierarchical file system, supposedly hacked together in one weekend by David A. Moon. Files on other ITS systems were transparently available through the "Chaosnet" (a predecessor of Ethernet, and probably an inspiration for it) simply by prefacing the filename with the name of the machine it was on.

Similar ideas later appeared in VMS/DECNET and Unix/NFS.

Eventually (1979?), ITS instituted passwords. Fortunately for me, they allowed guest users. Even without an account, one could get in fairly easily. I'll explain how, as it helps give a flavor for the system:

Users who weren't logged in still got a prompt. They just couldn't do much with it. One thing they could do was see who's logged in. Another was use the SEND command to send a real-time message to anyone who was logged in at the time. Anyhow, when one wasn't logged in, one could use SEND to send to someone else who wasn't logged in. The SEND command would then automatically invoke the MAIL command. And from within the mailer one could do "<ESC> E" to invoke EMACS (just as today in the Unix mail command, one can do "~e" to do the same thing). And from within EMACS, one uses "^X^V" to load DDT (the exec) and "^X^W" to write it over SEND. Then one aborts out, and invokes SEND a second time. Only since SEND had been replaced with a copy of DDT, you'd be in the exec, fully logged in.

Unfortunately, the machines (PDP-10s) were usually so heavily loaded that guests were often restricted to using them after midnight. During slack periods, they were allowed on as early as 8 pm. And sometimes all day on weekends. File space was quite

restricted. And guests didn't get personal directories. Also, there was no file protection. Anyone could read or alter any file on the system. And anyone could spy on anyone else's session, and even link to their exec and issue commands to it. This is something I really miss in Unix and VMS – when a user needs assistance it would be very handy to be able to look over their shoulder and to type commands for them while they watch, remotely.

Guests were allowed to, and even encouraged to, modify the system. If people didn't like the modifications, they were taken out again.

The ITS convention was that it was O.K. to read other people's mail. Eventually, this collided with the net-wide convention that this wasn't O.K., with some unfortunate results, which included at least one divorce, that of Marty and Nancy Conner, who had married after meeting on the Bandykin mailing list.

The Bandykin list was originally set up for the friends of Bandy (Andrew Scott Beals) to console him for the loss of his girlfriend. I think this was in 1984 or so. It was alluded to, not by name, in Quarterman and Hoskins' "Notable Computer Networks" (CACM, October 1986 – please don't try to write a history of the net until you've read this paper). It was later renamed to Kin, when Bandy wished to be dissociated from it. Before dying, it spawned off a number of other lists, including Elbows, Lectroids, TANSTAAFL, and Info-Frobkin. That last list gave rise to FTP Software, a thriving Cambridge firm with which the company I work for has recently done business. (FTP Software was presumably named after the net's File Transfer Protocol, which of course greatly predated it.)

The Kin list died because Marty Conner reserved the right to add anyone and everyone to the list. The new lists were constituted without him, and with strict rules about who could join.

It wasn't until 1981 that I had fairly consistent access from home, using a borrowed 300 baud modem and H19 terminal. Prior to that, I had often gone months or sometimes years between access. After 1981, I have never been offline for more than a month. I missed a month in 1986 due to TAC logins finally being installed. And another month in 1993, when I was installing computers overseas. (Ironically, as of last month those overseas computers are now on the net!)

In 1982 I got my own Heathkit H19 terminal and assembled it. I used it until I got a 286 PC in 1986. I'm still using that PC. I'm currently using a 2400 baud modem I borrowed from work three years ago. Prior to

that, I was using my own 1200 baud modem. Early this year I rescued a TI Silent 700 terminal from the trash can at a hamfest, mostly just for old times' sake. (The TI had been marked $15, but nobody bought it. They cost about $1000 new in the late 70s.)

In 1986, I started using a service called PC Pursuit. It allowed one to make off-hours long distance computer calls to about 30 cities in the US, including Boston. I used it not just to get onto ITS, but also onto various BBS systems around the country.

In 1986, 1987, 1989, 1989 again, and 1990, I visited MIT in person.

In May 1990, the last ITS machine was shut down. But I also had guest accounts on Unix systems at MIT by then. It was one of those on which I first used Usenet newsgroups, perhaps in 1987 or so. Previously, most of my activity had been reading and posting to mailing lists, having real-time chats, and downloading various text files. I recall one four-way real-time chat which included people in Virginia, Norway, the Philippines, and Missouri.

In 1991 I switched from using a Unix system at MIT to using Digex, a Unix system in Maryland, a local call from here. Not long after, I dropped PC Pursuit. PC Pursuit was nice at first, but they changed from allowing unlimited off-hours usage to one hour a day, while increasing their rates from $20 a month to $30 a month. Also, their local number was busy most of the time, and connections were sluggish, and frequently punctuated with the notorious "** POSSIBLE DATA LOSS 00 55 **" which invariably meant several pages had been discarded. I probably would have dropped it anyhow, as there were only two long distance BBSs I called regularly, and one had shut down, while the other had moved out of a PC Pursuit area (and has since shut down).

Digex was founded, and is headed by, Doug Humphrey, whom I first met in person at a convention called WATS-80 which he hosted in Washington DC in 1980. Oddly, instead of using his real name there, he called himself "Aubrey Philipsz" after a character in James Hogan's 1978 novel *The Genesis Machine*. I may have met him online earlier. He was DIGEX on the ITS machines. In those days, he had a large DEC-10 in his small apartment. He had bought it for scrap prices. He used to wear the key to it around his neck as jewelry.

In 1989 he had an ITS system in his apartment, which was only one of two not at MIT (the other was in Scandinavia somewhere). I don't think he still has it. (I wonder if there's a law against killing an endangered operating system.)

I remember his mentioning ARPAnet, and how easy it was to get onto it, during a talk he gave at WATS-80 in 1980. The implication was that we were all unauthorized users, but that nobody really minded – yet.

I don't think Usenet was mentioned at that convention.

WATS-80 was mentioned in the *Washington Post*. I'm sure I still have the newspaper clipping somewhere. (I always save everything forever, but often have a hard time finding it later, since it's mixed in with everything else I've saved.)

As you can see from my header, I'm still on Digex. [That was in 1994 -ed] It's grown a lot since I first logged on here, from a SUN-3 with an "MX record" (not directly on the net) with about 1000 newsgroups, to several large SUN-4s linked to the Internet backbone with a T1 line, carrying about 9000 newsgroups.

I still have an account on a Unix machine at MIT, too, which I can telnet into, but I seldom use it.

> one of the questions I am most interested in sorting
> out is "What was the degree of Usenet/Internet
> overlap at various times"?

That's hard to answer. I can give you my impressions. ITS was never part of Usenet. The idea of a newsgroup is a fairly obvious one, given mailing lists. I recall commenting in 1979 or 1980, that it was silly to mail a copy of the same thing separately to lots of people on the same machine, rather than mailing a pointer to it, and having one copy in a common area. In fact, the SF-Lovers digest was set up that way for some users for a while in 1980 S instead of being mailed the digest, they had the option of being mailed a notification that there's a new digest, so they can read it from the online archives. This was discontinued after a year or two, probably because it was only practical when most readers were on ITS, which is where the list originated. Almost all mailing lists originated from ITS, since it had the most advanced mailer software.

Rich Zellich maintained a "list of lists" which could be ftp'd from SRI-NIC.ARPA. For all I know, he still does. But it was hopelessly out of date by 1983 or

so, as there was no formal procedures for information on new lists, or on changes in old lists, to be conveyed to him.

I gradually became aware of Usenet via references in SF-Lovers, Human-Nets and other mailing lists. It became clear that some people didn't see something called the "SF-Lovers Digest," but instead read something called "fa.sf-lovers". I became aware of what newsgroups were, and that they all began with "net." except the ones which were aliased to an ARPAnet mailing list, which began with "fa.". Nothing began with alt. or misc. or rec. or sci. or soc. in those days.

Speaking of SF-Lovers, Brad Templeton put the first few years of archives (starting in 1979) on a CD-ROM last year, along with lots of recent SF novels and short stories. My brother has a copy. It's easy to scan these archives, unlike my personal archives which are on thousands of five inch diskettes, mostly unlabeled, in no particular order. It was fun to see my own postings, older than some current net users, now immortalized in plastic and tinfoil.

(I just checked that disc, and found that the first mention of fa.sf-lovers in the SF-Lovers digest was in August 1982, in a message which also mentions net.sf-lovers. I don't know if those were two different newsgroups. I can forward that message to you if you like.)

Actually, SF-Lovers didn't begin in 1979. It had an earlier incarnation, whose archives apparently haven't been preserved anywhere. It was shut down after Senator William Proxmire gave the ARPAnet his golden fleece award for wasting taxpayers' money, citing SF-Lovers and the wine lovers mailing lists as examples. (I don't know when this was, but it should be easy to look up.) The wine lovers mailing list never came back.

Usenet people also participated in mailing lists. They always had addresses in the form foo!bar! baz!zoo!yar!yaz where foo and yaz were the starting and ending points, or perhaps the other way around. ARPAnet addresses were always in the form FOO@BAR, or if they were on some kind of subnet FOO%BAR@BAZ. Traffic which had traversed the nets would look like foo!bar!baz%ZOO@YAR. It wasn't always clear which way to parse this.

I definitely had the impression that ARPAnet (later, Internet) and Usenet were two very different

things, and that mail got from one to the other only because one or two machines happened to be on both networks. These gateway machines which were on both networks kept changing, presumably because once word got out that one was acting as a gateway, it quickly became overloaded, and soon refused to act as a gateway anymore.

My impression (which may have been wrong) was that the Usenet mailing lists were completely different from the ARPAnet mailing lists, although some adventurous Usenetters were subscribed to the latter via a gateway.

There was a Usenet map file, consisting of several pages of ASCII line drawings meant to be connected together, which showed all the systems on the Usenet, and which ones talked (via uucp) to which other ones.

I may still have a hardcopy of this somewhere. I recall that only one or two machines on the map was also an ARPAnet host. But it was hard to tell, since a host's Usenet name and ARPAnet name could be (and usually were) completely different.

Today, I have the impression that Internet and Usenet are essentially the same thing. And that the overwhelming majority of newsgroup traffic flows via TCP/IP over the Internet, rather than via uucp over dial-up modems. Trying to separate them today seems about as productive as distinguishing the Angles from the Saxons today.

I recall that Usenet users were considered somehow lower class. For instance there was a message on the Bandykin list suggesting that Usenet people be banned from the list. I wrote a reply, replacing "Usenet" with "black", and "Internet" with "white," showing that "netism" (as I then named it) is as bad as racism. (I'm sure I still have a copy of these messages.)

Today, on some newsgroups there's similar, but lesser, netism toward AOL, Delphi, and/or Fidonet users.

> And I would love to know about the 1980
> ARPAnet crash - that's just after Usenet started
> (when in 1980 was the crash?)

October? I don't recall the cause, except that it came as an enormous surprise, as the ARPAnet was supposed to be crash-proof. Some kind of self-propagating host table update had a bug in it, I think. It was definitely an accident, not malicious, not an attempt to crash anything.

> Have you seen any history work done on Usenet
> and ARPAnet history?

I don't think so. Not until the past year have I noticed lots of books being available, describing what the net is like now, and how to do things with it. It makes sense that such books would appear before books that describe how it came to be that way, and what it was like earlier, the latter being of lesser immediate practical use.

The net's history is very small, measured in person-years. Perhaps 50 million? Compared to about 20 billion person-years of U.S. history, and a similar number of person-years for the Roman Empire, that isn't very much. Thus one might expect one net history book for every 400 U.S. history books.

> ... and when it is often written about, the details are
> often wrong (when it is written about by the press,
> etc.)

I've noticed that the press tends to be quite accurate, except when they're writing on a subject I know something about. :-)

Concerning quoting styles, the ARPAnet style was to indent the text being quoted, the Usenet style (which I've long since adopted) was to quote messages with a ">" character at the beginning of each quoted line, and the Fidonet style was to quote messages with the person's initials followed by a ">" character at the beginning of each quoted line. All three styles are now found on all three nets, as are various other styles, many of them nearly unreadable.

Often, the ">" is replaced by some other character such as "|", probably to get around software that puts limits on quoted text.

The earliest mailing list I'm aware of is MSGGROUP, a list for discussing e-mail and related issues. I've recently seen some online archives of it dating back to 1975, and I downloaded the earliest parts of it as a souvenir.

The first digestified mailing lists were SF-Lovers and Human-Nets, which became digestified in January 1980, because the daily volume became too great for the ITS mailer to handle overnight. With digestification came de facto moderation, since there was no automatic software for digestification. These may have been the first mailing

lists to be moderated.

The first *automatic* digestification, at least among the lists I read at the time, was on the Space Digest. I remember being very surprised by it. This was probably around 1982.

I think I first saw smileys in 1981 or 1982. The original one was :-).

FTP, telnet, and mail date back to the beginning of the ARPAnet, though they changed somewhat when NCP was replaced by TCP/IP (in 1982?). IRC, WWW, Archie, and Gopher are quite recent. I used something just like IRC on the BITNET in 1987 or so, and I'm pretty sure there was no IRC at that time, though there were MUDs. I used something just like a one-channel IRC on an HP-2000 (not on any net) in 1977.

I'm not sure when FAQs started, though I'm pretty sure they came from Usenet, not Internet.

GIFs, I'm pretty sure originally came from CompuServe.

> > (I do hope newsgroups have been, and are being,
> > totally archived.)

> They were by Henry Spencer at the university of
> Toronto - but he gave his tapes last summer to
> someone who claimed they would make a CD-ROM
> of them ...

Make a CD-ROM of the complete archives of Usenet? I believe the current volume is about equal to one CD-ROM per *week*.

> But also – some of the research I have done in the
> past is available from wuarchive.wustl.edu in
> directory /doc/misc/acn/netbook

I'll get that file as soon as I finish writing this. (I don't want to bias my recollections, and feed back information already in the file to you.)

Until 1990 or so, my perception was that the net, or at least my access to it, was likely to go away soon. TAC login was coming soon. Guest users at MIT were always becoming more numerous and weren't as well behaved as in the "good old days," thus were likely to soon all be flushed. The net often became unusably slow (i.e. five or ten minutes for what I type to echo – sometimes I'd type ahead a whole session, including the logout, before getting the password prompt) and it was obvious that guests would be flushed since the capacity

was now being exceeded.

Later came the infamous FCC "modem tax" threat. The outrageous idea was that the net, PC Pursuit, etc, were underselling the phone company and the post office, and that this was unacceptable. Thus, whenever information crosses a state line electronically, it would be charged as much as it would cost to send via a regular modem over a regular long distance phone line. (This was when regular modems didn't exceed 1200 BPS.) This threat later came back as a recurring "urban legend," but it was quite real the first time. Fortunately, the FCC received more letters opposing it than they had received in all history on all other issues combined, so they reluctantly backed down. Packet nets such as the Internet and PC Pursuit are inherently much cheaper than a dedicated phone line. It's like the difference between sharing a lane on the road, and having a whole lane dedicated to you for the duration of your trip. Naturally, the latter costs much more. A dial-up phone line is exactly equivalent to ftping a 64KB file every second, plus another one at the same time in the opposite direction, for the duration of one's session.

This "modem tax" would have been an extreme and senseless distortion of the marketplace, roughly equivalent to putting a one million percent tax on trucks driven forwards, but not on those driven in reverse gear.

There's long been a lot of commonality between people on the net and people at Science Fiction conventions (cons). Not only are SF cons discussed a lot on the net, but SF cons have had "@ parties," or "@! parties" since at least 1986. There are also often parties associated with a given mailing list or newsgroup. I'm not sure whether in general people discover the net at cons, or cons on the net, or whether, like me, they discover both independently.

Also, either a disproportionate number of libertarians are on the net, or – just as likely – the news media are lying to us about how many libertarians are in the general population.

There's also a lot of overlap with ham radio types. The net is the exciting electronic frontier that I thought I had permanently missed when reading amateur radio magazines from the 1910s. I used to have a ham radio licence, but let it lapse when I discovered the net. I couldn't combine the two hobbies, as ASCII wasn't allowed on the air until

1980. And packet ham radio came much later. (It's interesting to note that the American Radio Relay League was founded in 1916 by hams to organize networks of hams to relay messages (their own and messages from the general public) across the country, and, ten years later, across the world, using Morse code. It still exists, and I was a member for a while.)

An early mailing list was Human Nets. It was for the discussion of "Worldnet," a hypothetical future worldwide computer network. The list is long gone, but I hope the archives are available online somewhere. They'd make valuable reading for you, since by reading them "backwards" you can get a good image of what the net was like at that time, just as the best way to see what was considered bad about a time and place is to read a utopian novel written then and there, since a utopia is always fairly similar to what the author is accustomed to, with the bad features removed or reversed.

One April Fool's Day sometime in the early '80s, there was a hoax posting from KREMVAX, which purported to be a VAX in the Kremlin in the USSR.

This was considered quite hilarious, since the ARPAnet was for US defense, and the USSR was our enemy. At that time, there were hosts at US bases overseas, but nowhere else outside the US. Much later, after Russia was on the Internet, someone in Russia became aware of this prank, and named their Internet host KREMVAX as a lark.

> Thanks for writing. Would you like to say
> something about today?

Today there are more systems on the net in our computer room where I work, than were on the whole net in 1977. Some of these systems are a single circuit board that could fit in my shirt pocket.

And tomorrow?

[The above e-mail message was written over three years ago. The author's web site is at http://www.clark.net /pub/kfl/. In a recent e-mail message Keith Lynch updated this e-mail exchange: "Note that in 1994 I saw WWW as just another random service on the net, along with Archie, Gopher, and IRC, rather than the 800 pound gorilla it has become. And spam was such a minor issue in those days that I didn't even mention it, while today it takes up the majority of my online time. I believe spam is the greatest threat the net has ever known.

I'm against Usenet 2, or any other retreat due to spam. I don't discard any e-mail unread, or munge my address, or cease posting helpful messages to Usenet, or move to Usenet 2, or register with remove lists, or do anything else to surrender any part of the net to spammers, or to imply their legitimacy.

Let THEM built a second Usenet or a second Internet. I won't let them drive me off this one. I wish everyone felt the same. I wish every spam to ten million victims was met with ten million strongly worded complaints. We made AGIS back down. We drove Spamford off the net, along with Nancynet, Walt Rines' Quantcom, and a dozen other rogue domains. Spammers are on the defensive now.

See http://www.clark.net/pub/kfl/ftc.html for my coverage of the FTC spam hearings six months ago, which I attended. See http://www.clark.net/pub/kfl/ toll.html for my list of toll-free numbers seen in recent e-mail spam.

Also see http://www.clark.net/pub/kfl/timeline .html, which should be of interest to every Internet historian."]

Netizens: Review of Reviews

The Amateur Computerist is proud to announce the book *Netizens: On the History and Impact of Usenet and the Internet* by Michael Hauben and Ronda Hauben, two founding editors of the *Amateur Computerist*, appeared in May 1997. It was published by the IEEE Computer Society Press. Many of the chapters of this 345 page hard cover book had previously appeared in earlier versions as articles in the *Amateur Computerist.* It is now available in bookstores but remains online as it has been since January 1994 at http://www.columbia.edu/~hauben /netbook/. In October 1997 a Japanese translation was published by Chuokoron-Sha. The book has been greeted by a number of interesting reviews in English and Japanese.

Michael Swaine writes in *Dr. Dobbs Journal*, a magazine for programmers, that he liked "the copious quotations from the actual participants" in the development of UNIX, Usenet and the Internet that *Netizens* documents. "The Haubens," he writes, "have produced a readable but well documented story of the development of the Internet. They spent

years working on the book, and really seem to have done their research." He urges authors of other technical books to emulate them.

In a review in *ComputerWorld*, a computer industry weekly publication, Johanna Ambrosio recommends "… this book is a must-read for anyone even remotely connected with or to the Internet." She describes it as "part philosophical tome…, part social science and part history…. worth the price of admission solely for its look at some of the Internet/ARPAnet pioneers." She points to the visions documented in the book such as viewing communication as an interactive creative process and the importance of people in the computer industry today learning from them. The review ends, "Read this book. As good books are supposed to do, it makes you think."

An article in the *Orange County Register* (Ca) by Leslie Gornstein reviews *Netizens* for the newspaper's 400,000 readers and includes a telephone interview with the authors. The headline reads "Should Net Access Be a Right?" Ms. Gornstein reports that the book "calls for Net access for all," even suggesting "a bill of rights for online dwellers." She writes that this book – both a history of the Internet and a theory on its role in society – advocates, "Equal Internet access time for all. Equal quality of connection for all. Banishment of official 'spokespersons'…. Banishment of personal profit resulting from what others contribute online…." She quotes from the book that, "The Net is not a service, it is a right" and includes that Internet dwellers must contribute as much as they benefit. In the interview portion of her article, the reporter asks, "So you see the Internet as a utility?" and gets the answer, "…that is how the early pioneers saw it." This review for a more general audience stresses the social aspect of the book and the importance of the book to those not online yet.

In the December 1997 issue of *;Login:*, Daniel Lazenby reminds the Unix community and others who read *;Login:* that "ordinary people have made and can make a difference." That he says is what *Netizens* documents by capturing the story of those who quietly nurtured and fostered the current revolution caused by network technology. He writes that *Netizens* is easy to read and he is struck by the potential it shows for Usenet and the Internet to create a much grander communications and information revolution than even the printing press achieved. The reviewer points out the importance of staying true to a vision with the example of "Licklider's refusal to set his sights lower than the vision of a global computer" network. He ends his review saying, "look closely while reading the book and you may find yourself viewing the world a little bit differently when you finish."

Karin Geiselhart, a PhD student in Australia, reviewed *Netizens* for the journal *Internet Research*. She welcomes *Netizens* as "a book which champions grassroots democracy." By speaking through the online citizens that helped shape the net in its early days, she writes, "*Netizens* demonstrates the potential for users being active participants in an ongoing process" of development. She reminds us that "technology should serve people." Geiselhart remembers Vint Cerf commenting in Montreal at the INET'96 conference that "Democracy doesn't scale" but she ends her review by commenting that, "*Netizens* is an affirmation by the authors on behalf of all their fellow Usenet contributors, and all of us who have benefitted in some way from the altruism and free information which flows across the Internet. Theirs is an optimistic mantra: democracy can scale."

The Japanese translation has on its cover in English, "Net + Citizens = Netizens". It is 381 pages but does not contain all the chapters of the English version. It is reviewed in the Sunday 10/26/97 edition of *Nihon Keizai Shimbun* more commonly known as "Nikkei" (the *Wall Street Journal* of Japan). The review by senior staff writer Waichi Sekiguchi discusses who Netizens are, stressing that the authors of *Netizens* are referring to "the people who work cooperatively with all the people on the Net and coordinate the work they do all over the world through the Net." Mr. Sekiguchi writes that Netizens are a new species of Homo sapiens who participate in ways that are more democratic than in the rest of society. He points out that the authors of the book find cooperative and democratic behavior on Usenet and that they say that individuals being able to send and receive information is more democratic and powerful than the mass media where only a small number of people send the information. The reviewer writes that this book is particularly important in Japan because readers there will learn from it how to hear the voice of Netizens needed for the current administrative reform movement.

Besides offline reviews of *Netizens* there has been some mention of the book online (See the review by Mark Horton below). The *Chronicle of Higher Education* on its Academe Today mailing list

pointed to *Netizens* as a new book on the societal impact of the Internet and the history of Usenet now in bookstores which can also be accessed online. In another online review, Cye Waldman writes that even though to him the Internet means the World Wide Web it is important to read this book so all Netizens are "aware of the forces that are shaping our lives." *Netizens* is not a casual history of the Internet as is found in many books he concludes but "rather, it is a thoroughly researched piece of work that chronicles one of the most important phenomena of the decade."

This is a positive start for *Netizens*. If any readers of the *Amateur Computerist* write a review or see one, we would be interested in knowing about it. We again congratulate Ronda and Michael on seeing the product of their hard work gaining some of the respect and review it deserves.

Two Book Reviews: Netizens
REVIEW from *CMC*

<div align="right">by Mark Horton</div>

by Michael and Ronda Hauben
Published by the IEEE Computer Society

Netizens describes the history of the Internet, focusing especially on the formation of the Usenet bulletin board system. For me it was a trip down memory lane. The social and political implications of opening up communication among a group of academic philosophers was groundbreaking, and *Netizens* is there to give us the play-by-play.

The book includes interviews with the founders of Usenet and with the pioneers who contributed to its character and growth. The story of how Tom Truscott's summer job at Bell Labs, volleyball, chess, and "rising at the crack of noon" turned into the seed of Usenet is inspiring, especially in this age of cost-cutting and disposable computer software. The authors make good use of an archive of the first few years of Usenet postings. Those of us who were there remember much, but the archive is like putting history on videotape. Quotes from the formative days remind us of the issues of the time, such as the unwillingness of the ARPAnet to talk to Usenet; censorship; and how the high cost of getting Usenet to Europe was overcome.

Chapters of the book tell the history of many of the building blocks of the Internet. The early days of the

ARPAnet are chronicled, from the selection of the first four sites in 1968 to the people involved and how they solved the early problems of the net. Netizens also tells the story of the UNIX operating system, how it came about, the key contributors, even how the "grep" command got its name.

Photos from the 1950s showing computer center machine rooms with IBM 704 components taking up the entire room, key researchers at places like MIT, computer chess tournaments, and the founders of Usenet add to the sense of history.

This is an excellent book. The academic style means you'll have to think to read it. This book is a vital element in any Internet historian's library.

REVIEW from *;Login:*

<div align="right">by Daniel Lazenby
dlazenby@ix.netcom.com</div>

The title says it all. This book tells the story of how ordinary people have made and can make a difference. Often the revolution caused by a technology and the people who quietly nurtured and fostered it into being is not recorded until well after the fact. *Netizens* strives to capture the history while some founders are still able to provide firsthand accounts. This easily read book chronicles the evolution of Usenet and the Internet. Not only does *Netizens* chronicle the past; it strives to illustrate the life-changing influence Usenet and the Internet have had on people and society. The book also takes a few moments to ponder the changes yet to come. This book is based on academic research papers that Michael and Ronda originally published on the Internet.

Netizens is broken into four major parts, "The Present," "The Past," "And the Future," and "Contributions Toward Developing a Theoretical Framework." The first part recaps what has been created and how it was created. "The Past" reviews where Usenet and the Internet came from. This part of the book explores the grassroots beginnings of Usenet

and the gestation of what is now known as the Internet. The third part explores the effects of the net on individuals, organizations, and societal structures. "Contributions Toward Developing a Theoretical Framework" contains two chapters. The first compares the printing press, Usenet, and the Internet. At the time of its invention, the printing press created both communication and information revolutions. This part of the book presents Usenet's and the Internet's potential for creating another, much grander, communication and information revolution.

In this day of ubiquitous modems, the Internet, Internet providers, and personal computers, one sometimes forget there was a time when these things were not widely available. Many people and organizations were responsible for the creation of the Internet and Usenet. Much thanks should go to the Department of Defense for funding the early research. Among the many people involved, several stood out. J.C.R. Licklider and Robert Taylor are two names associated with the founding of the Internet. They saw the computer as a communications tool with global connectivity and as a way to share both computer and human resources. This perspective was a very radical idea in 1968, when computers from different manufacturers could not exchange data or communicate with each other. With Department of Defense research dollars and the Advance Research Projects Agency (ARPA), Licklider solved the immediate problem of getting incompatible computers to talk. But he never lost his global vision. His efforts resulted in the computer communications networks (ARPAnet). The global Internet can trace its roots back to this simple ARPAnet.

What if you were a poor, under-endowed university without Defense Department research dollars? How could you get your computers talking to each other? Enter the "poor man's ARPAnet." Tom Truscott, Jim Ellis, and Steve Bellovin all had a desire to automatically share files and articles among several computer platforms. Fortunately, they were university students and cash poor. So they did the only thing they could do: they acquired some university computer time and an auto dialer and applied a little creative UNIX hacking (the positive kind). Using these limited resources, these fellows developed what is now known as Usenet. Their first incarnation of Usenet simply dialed another computer, checked for new files, and then copied all the new files to itself. They set up their first Usenet network on three university computers. Within a few years, these three nodes grew into several hundred nodes and eventually became part of the Internet.

This book illustrates that ordinary people with limited resources and a vision can made a difference. The grass-root's creation of Usenet by Tom Truscott, Jim Ellis, Steve Bellovin, and others is such an example. People with significant resources and a vision can solve a specific, localized problem and simultaneously lay the foundation for solving global needs. Licklider's refusal to set his sights lower than the vision of a global computer [network] is an example of exceeding short-term expectations. Look closely while reading the book, and you may find yourself viewing the world a little bit differently when you finish.

Community in the Usenet Newsgroup k12.chat.teacher

by Michael Hauben
hauben@columbia.edu

Usenet newsgroups cover a diverse spread of interests. I chose to explore what human community can develop facilitated by the Usenet form of computer mediated communication (CMC) by looking at the newsgroup k12.chat.teacher.

An interesting framework to use to analyze this forum is M. K. Halliday's definitions of field, semiotic tenor and mode (see Halliday's *Language and Social Man*). As participants in newsgroups usually do not share the same physical environment, all information needs to be shared in the typed out text of messages, whether it is the content or context of the questions. In CMC there is no field to be looked for outside of the actual interaction saved to the newsgroup in messages (and also in private e-mail). However, the topic of the newsgroup defines the tenor in that this particular section is for the discussion of teachers with other teachers in a k12 situation. For the most part the newsgroup is a community of peers, with other visitors, some welcomed and some not.

The mode and the field of each message are the most variable elements in this framework. For mode,

the messages can be 1) providing information, 2) posing a statement, or 3) posing a question. Responses can be 1) making a constructive agreement, 2) making a constructive disagreement, 3) providing details or experiences as evidence, 4) asking more questions, 5) making acknowledgment or emphatic support. In addition to these, there are out of place responses and messages or responses attempting to be disruptive. As the subject matter comprises part of the field of each message, that is what will be further explored in the rest of this article.

The data source explored is the Usenet newsgroup k12.chat.teacher where kindergarten through 12th grade teachers and others discuss education. Teachers use it as a support and resource group to talk about the problems, responsibilities and duties as a teacher. Concerns about education, and working conditions are also brought up by current teachers and people preparing to be teachers. The data consists of messages collected over two time periods - from February 7, 1997 to February 25, 1997 and from March 26, 1997 to March 31, 1997. The sample from the newsgroup includes single messages and message threads from this newsgroup. Message threads are created by news reading software linking original messages, with responses made to the original message and subsequent responses. In addition to the public responses, private e-mail messages were most likely sent to the original posters of messages. However, because e-mail is private I have not gotten to see such responses since I only looked in the public message board. If I were to continue this research or extend this project I might contact the original posters of messages to find out if they would be willing to share any private responses that they received.

I have found the discourse and community in this newsgroup to be constructive and worthy of study, as there appear to be a large cross-section of active people who create the critical mass needed for useful discussion and conversations. I have not encoded the individual's names because Usenet newsgroups are public bulletin board areas available to anyone who has access to either Usenet or the Internet. People who participate in newsgroups usually understand this, and post messages hoping others will read them and provide commentary. This desire to share and communicate is what makes Usenet valuable. It is essentially a public space.

The main areas of discourse, as part of the field of the messages, are teachers' relations to their students, school administration, the students' parents, other teachers in their work, other classes in other schools, and what turned out to be the mainstay of conversation, the teaching profession.

Other topics covered included asking technical questions about using computers and other new technologies in the classroom setting, either in the presentation of material to students or for the interactive use by students. Other useful postings included the announcements of web pages and e-mail lists that teachers might find interesting in developing curriculum or students might find interesting exploring as part of time on the world wide web.

Sadly k12.chat.teacher is not obscure enough to hide from the noise on the Net, widely posted inappropriate spam messages which usually never interest the readers. These messages are accompanied by other commercial advertisements which teachers are used to seeing in normal education journals and magazines. These seem to be carry-overs from the old media, and are not the same as the grassroots voices of teachers airing their real problems leading towards discussion that is valuable to all who read and share the common situation. However, the forum has more airing of the new voice than the old, making it worthwhile to join the community.

The people primarily vocal in the community of k12.chat.teacher are current teachers teaching in public and private k12 classrooms, students studying to be teachers and looking for jobs, and parents. Seeing parents involved was surprising at first, but their discussions of home schooling and talking about the education of children and adolescents was quite appropriate. Both teachers and parents spoke of the parent's role in their children's education, and how caring parents should be equally interested in aiding their children's education as teachers are required to be, if not more so. It would be interesting to study other newsgroups such as misc.education to see who reads and is active utilizing other newsgroups concerning education.

Following are examples of messages posted to this Usenet newsgroup, with some descriptive analysis. The five major categories were teachers and their relations A) to their job and the teaching profession, B) to their students, C) to parents, D) to other teachers, and E) to administrators. The remaining two categories are F) examples of miscellaneous questions and G) JUNK postings/SPAMS.

CATEGORIES (and common topics)

A) Discussing the Teaching Profession.

A large number of the messages here were from teachers or student teachers looking for jobs or thinking of looking for jobs. A number of the teachers were currently substitute teachers either remarking on their uncertainty of moving towards obtaining a full time job, or describing their strategies towards gaining one. Others were first or second year teachers looking to gain certifications to get better teaching jobs or better paying positions. Other people were looking for help with particular curricula or sharing their lesson plans and web pages. Various messages asked for help with building curriculum units. Teacher concern was another subject especially the role of what was wondered to be an either overly zealous principal or possibly just a deeply concerned one.

Each of the remaining broad topics received less amount of focus, but were still represented.

Example 1:
From: "Jennifer M. Blaske" <redhead1@mindspring.com>
Subject: Re: I am interested in teachers experience in getting hired.
Date: Sat Feb 15 09:34:49 1997

Brett Lettiere wrote:
>
> I am an undergraduate at I.S.U. I am interested in hearing
> other teachers discuss their experience of getting hired
>and about their first years as a teacher. I am interested in
> how they handled their class in the beginning. I am also
> interested in knowing how hard it was getting hired.
Well, as I've mentioned here before, I've been subbing for a year while certified and have still not been offered anything. I know an experienced art teacher from another state who has been subbing for five years and still does not have a position. I know the teacher's think she's a great sub, so I don't know what's going on there. I also know two teacher's assistants – also experienced teachers – who became assistants in the hopes that it would lead to their own classroom. After three years, they are both still waiting.

-Jen

Example 2:
From: poet@netcom.com
Subject: Re: Certification upon certification?
Date: Thu Feb 13 09:13:26 1997

In article <01bc19b1$3bf2b980$9078adce@CSR.concentric.net> "Michael"<michaelb@concentric.net> writes:
>

>I am pursuing a degree in education (Secondary English);
> I am beginning to hear about different certifications
> which are in addition to the overall teacher certification.
> For example someone yesterday mentioned to me that
>she was thinking about trying to get her computer
>technology endorsement. What are these additional
> certifications for? Do I need them even if I am already
> adept at the subject which the endorsement covers?
>
>Confused.
>Michael
>
I suppose this varies by state, so it would probably be best to contact your state teachers' credentialing agency, most likely located in the state capital.

As far as endorsements, or authorizations as my credential lists them: these do not, strangely enough mean knowledge of the subject, but rather permission to teach the subject. You may be fluent in Spanish or Greek, but you can't *teach* it without the authorization on your credential.

It's good to pick up as many authorizations as you can (you can pick up more after you have your credential, by the way), because school districts like people who are versatile, so as enrollment rises or falls, or more Spanish speakers move in (or out) of the district or the school acquires more computers, or four years of math or basket making becomes a requirement to get into junior college, you'll be able to step into those positions as necessary. If you are certain that you only want to teach XXX and never anything else, then don't get the authorizations, but expect to have a harder time finding a job, though if it's chemistry or calculus, it'll be easier than if it's English.
Good luck!

B) Teachers Relations with Students.

Messages discussing the relationships between teacher and student included the role of uniforms for both students and teachers. (For teachers, less about an actual "uniform" and more about trying to dress professionally whether that meant a shirt and tie, or just nice well-kept clothes.) One thread discussed the responsibility for interest in the classroom and education - how much rested with the teacher and how much was shared between teachers and students. Again we see requests for help defining curriculum, for example in the teaching of language arts and idioms or suggestions on how to develop a lesson around the then recent Hale Bopp comet.

Example 1:
From: redrose@ix.netcom.com
Subject: Re: are teachers responsible for making class 'fun'?
Date: Sun, 30 Mar 1997 19:16:04 +0000

One person wrote:
>>I feel classes should be more fun and that responsibility
>> is the teachers.

Another person wrote:
>Wrong! Learning is *your* responsibility.

Personally, I think they're both right. It is BOTH the teacher's and the student's responsibility. It takes two to teach.

For myself, as a teacher, the question is, "What is the definition of fun?" Or, rather than fun, interesting. I have many intelligent, thoughtful students who can find interest in difficult, challenging material, but unfortunately, they are in the minority. I sometimes feel frustrated that my students do not want to take the time to penetrate readings that are not immediately easy to understand but are nonetheless interesting. Or to go through the process of solving difficult problems. For many students "difficult" means "boring," (or "not fun.") My objective is not to make school "fun," but only meaningful, relevant and interesting, but some things are just difficult and require a good deal of cognition, which is demanding.

The idea of "dumbing down" school is often to make it more "fun," and thereby watering down material to make it flashy and shiny and like a game, but there can be tremendous satisfaction in reading difficult literature (both fiction and non-fiction) or ploughing through a high level math activity. For me, the most "fun" I ever have is having a stimulating conversation with someone who is knowledgeable and articulate about many topics. The only way to arrive at that level of broad knowledge is to confront intellectual challenges. Be willing to do that and you will find your classes a good deal more interesting and therefore "fun."

Deborah

Example 2:

From: Elizabeth Keith <bethk@flash.net>
Subject: Re: Teaching Idioms
Date: Sat Feb 15 23:17:07 1997

Linda E Lombardo wrote:
>
> > teach0629@aol.com (Teach0629) writes:
> >
> > >Hi! I'm doing a research project on American Idioms.
> > >If you have any ideas or any info. on ways that one
> > >can teach them, explain them or where they came
> > >from--would be REALLY helpful.
> >
> > Really. Regardless of your opinion of Americans, it is
> > not nice to call names in a public forum. Not to
> > mention, your lack of specificity. Are you talking about
> > North Americans, South Americans, Central
> > Americans? And why do you think Americans are
> > idiots?..... Oh, wait.... Never mind....
> >
> > Perhaps if you can give an example of what you mean
> > by American idioms, and what you are trying to get
> > across....

>
> Kurt Duncan (kduncan@ southwind.net) writes:
> Idiot = one who does not know what an idiom is. :>
> just kidding
>
> Don't you mean
> shake a leg
> get the lead out
  <...OTHER IDIOMS DELETED...>
> pinch a penny
> got the ax
>
> etc. etc. there are a million the only way I've seen
> these taught (and this was just for fun to play with
> language) students would draw a picture of the idiom
> and write it and perhaps it's explanation at the bottom.
> It was interesting to find out that they have idioms in
> other languages also. You might explore that as an
> additional activity.
> ---
>
****
>
> "Whatever the cost of our libraries, the price is cheap
> compared to that of an ignorant nation."-Walter Cronkite.
>
****
>   LINDA LOMBARDO AMHERST, VIRGINIA

One of the ways I've introduced idioms is by reading the children a book called The King Who Rained by Fred Guynn alias Herman Munster. He wrote several books like this and they are fantastic. His illustrations are terrific too. The kids love it.
–beth

C) Teachers Relations with Parents.

A big issue entering into many of the messages was the responsibility of parents for their children's education and well-being. Some teachers complained about the apparent lack of caring and sometimes attitude from parents that it is all the teachers responsibility. Others were parents who posted about the importance of integrating learning into more aspects of life than just school. One large thread included one teacher's request for ideas in a way to incorporate parents more into the everyday activity at school. Some suggestions included making parents welcome at school as co-educators, perhaps teaching one-time skill sessions or similar presentations. This suggestion was so that parents would not feel unwanted as non-professionals. So the tensions and communication are happening outside of once a semester parent-teacher conferences which helps teachers (and parents) to change. The questions of the relationship

between parents and teachers get raised, and this leads to the consciousness needed before changes can happen in the larger society.

Example 1:

From: "M. A." <manorman@roanoke.infi.net>
Subject: Re: Teacher Accountability and Parent Responsibility
Date: Sun Feb 16 14:39:17 1997

Dear Fred,

I am a teacher who would like to see parents take an active role in their child's education. This would include not only a nightly session with checking and assisting with homework, but also a daily session of reading and practicing math facts - whether it is when dinner is being cooked, and the child practices measuring out a cup of water to looking at the receipt from the grocery store and figuring out if one can of fruit cost $.79, how much would three cans cost?? I think if parents would let students see their interest in what they are learning and _apply_ it to their homes, then children would be more apt to think of learning as something they do EVERYWHERE and not just at school. It is most important for us to create a sense of learning for life, rather than learning for school. We are trying, but it will take all of us to make education worthwhile for the 20th century!

Thanks for the opportunity to speak!

Example 2:

From: philcain@orelle.com (Philip Cain)
Subject: Re: Parent/School Involvement
Date: Sat Feb 15 16:08:35 1997

bbechst@bgnet.bgsu.edu wrote:
> A team of teachers at our Junior High is trying to
> develop a method of involving parents in our school
> community. We would like to have parents in the
> building as consistently as possible. We are a school of
> 600 students, consisting of 7th and 8th grades and 45
> teachers. We would like to improve our overall student
> morale, motivation and mannerisms. We would also like
> to let the community know how our school operates and
> what the students are learning.

If you mean to break down traditional barriers that separate teachers and parents, your goal is commendable.

I think the basis for any association between the two groups has to be the acknowledgment that both are teachers. Both groups must say this out loud and mean it.

Then, to begin a practical relationship (I'm a parent, so I speak from that viewpoint) it is necessary to "let" the parents in. I say it this way because many (most?) parents feel "left out", not because teachers necessarily keep them out, but because teaching is a profession and, as with other professions, non professionals don't "belong" there.

To let the parents in, it might be useful to invite them to teach something. In a controlled environment specifically for the purpose, a parent might be given a point on a lesson plan and asked to give a try at getting the point across.

The purpose of such an exercise would not be to train parents to teach but to give parents a taste of it and so some vocabulary to facilitate talking with teachers.
–Phil Cain

D) Teachers Relations with Other Teachers in the School and in Other Schools.

One issue that was probably easier to share slightly anonymously was problems and questions of relationships with the other teachers within the schools people worked at. By raising issues possibly sensitive to raise with others at their location, it was possible to explore the possibilities and think things out before going to teachers at their location to discuss particular problems and relationships. Also the medium allowed teachers to hook up with teachers in other schools and potentially link up classrooms.

Example 1:

From: "Margaret" <twv000@mail.connect.more.net>
Subject: problem teacher
Date: 27 Mar 97 17:20:48 GMT

Hello all,
I teach in a very small public school (285 students K-12) in a rural area. The teachers and students get to know each other very well here. The problem is we have one teacher who constantly puts students down *in front of other students.* He/she tends to "join in" when the "popular" kids start making fun of the "unpopular" kids; and he/she makes remarks in class like "oh you don't want to sit next to Nelson, he smells bad." All this in front of the entire class, and in front of Nelson. The principal and superintendent are aware of the complaints against this teacher, but they say they have to hear it first-hand from the students, not second-hand from teachers. The students involved are afraid to come forward for fear of retribution by the teacher. (Actually, the students who are the butt of the criticism are too humiliated to ever say anything to anyone, but several of the "popular" students are very upset by what they know is just not right.) I have had several students tell me about this, and have relayed the information to the administration, but as yet nothing has been done. So I guess my question is, WHAT WOULD YOU DO? Because I have lost enough sleep over this, and I am tired of seeing kids get hurt, and I am starting to question my entire profession, and wondering why I bother caring when no one else does.
--
–Margaret
Please copy replies via e-mail, as I am experiencing some technical difficulty with this news server.

Example 2:

"Sarah M. Syrek" <smsyrek@concentric.net> opined:
>I'm researching a project for my masters program on the
> "myth" that teachers fear technology taking over their
> jobs. I'm really not finding a lot out there and was
> wondering if anyone had any input. Either side of the
>issue would be fine. Also if you are aware of any articles
> or other research done in this area I would appreciate
> knowing about it.

I don't believe it's the case that teachers fear being replaced by computers. However, a good many are afraid that they'll be forced to learn to use one-- which is becoming increasingly likely-- and that they just won't be up to the task.

Kids are usually far less intimidated because they know they don't know. Learning is part of being a kid. Adults, on the other hand, are used to knowing and get frustrated when lack of knowledge interferes with completing a necessary task. We're also busier than kids and often don't have the time to "play" with the computer to find out what it will do.

–jul
~~~~~~~~~~~~~~~~~~~~
"What were once
vices are now the
manners of the day."
Seneca, 4B.C.-65A.D.
~~~~~~~~~~~~~~~~~~~~
DO NOT SEND UNSOLICITED
EMAIL TO THIS ADDRESS.

E) Teachers Relations with School Administration.

Yet another tough problem is how to be a good teacher, and at the same time handle the demands from above, whether principals, or even further from school boards and administrations. The newsgroup provides a good forum to compare notes and discuss what teachers are being asked to do around the world from the top-down, and discussing how to deal with such demands.

Example 1:

Rick MacLemale (maclemr@intnet.net) wrote:
> Hello all...
>   My county is currently in this phase where elementary
> teachers are being discouraged from using averaging as a
> means to determine grades. Elementary teachers are told
> not to average, but to instead "look at the progress of the
> whole child". The only catch is that that's all they've told
> us. Anyone (who does not use averaging) want to share
> their grading systems?

Sounds like one of those great school board concepts that are simply not thought through. Sort of like when my principal told us not to teach for the test (in New York State we have Regents exams). One teacher asked if pass fail statistics were no longer going to be calculated for each teacher. The principal went on to the next topic.

One way of fairly grading the class while still looking at progress is to weight each exam higher as the year goes on. For example, the first test might be weighted as 1 test, the second as 1.1 tests, the third as 1.2 tests, etc. It sounds pretty cumbersome but shouldn't be too bad if you use a spreadsheet.

Good luck,
Howie

_____
> Richard MacLemale
> Teacher + Programmer
> http://members.aol.com/RMacLemale/CoolClassroom.html
> (Educational freeware + shareware)

Example 2:

I am not a teacher, and am posting this message to the newsgroup, requesting helpful comments/suggestions for my sister whose Internet access is limited. I would be glad to get them via e-mail or in this newsgroup.

My sister, a first grade teacher, is under a great deal of stress with a new principal at her school who will be evaluating her teaching. Her message indicates that other teachers in her school are being evaluated by others, and the evaluation requirements are inconsistent between the evaluators.

Like most teachers she spends a lot of her personal time and money preparing for her classes and providing educational materials for her students that the school does not provide. She is very a very conscientious teacher and loves teaching. She is 58 years old and plans to continue teaching for several years since she didn't start teaching in public schools until about 6 years ago.

This is what she wrote me in email:

> I told you that I would be having an evaluation by the
> new principal soon. I have been thinking about what to
> do. He gives you a message for the "week of" and can
> drop by at any time his heart desires. He had a
> pre-meeting and told everyone what he expected to see!
>When we told the other teachers who are being evaluated
> by other individuals they thought he was on an
> intimidation trip. He wants stuff no one else has ever

>requested before. He wants a desk...a chair (he's in there
> 45 minutes), he wants to see lesson plan books (no one
> has done that since I have been teaching at <school
> omitted>.), He wants to see portfolios of all the children
> with evidence of their work, he wants a map of where
> named children are sitting, he wants to see all the
> elements listed on the TTAS plan, he wants to see
>individual situations, group situations where children are
> working in teams, he wants to see all participating and
> being successful, he wants to hear lots of higher level
> thinking skills tossed around, he wants NO DOG
> AND PONY SHOWS....oh please....what else is all
> that!!!

>Some teachers, especially older ones, are concerned that
> he may knock them off the career ladder, which would
> mean a loss in pay. If he did do that, I feel there would
> be such an outcry that he would be looking for a new
> school post haste. We all do a good job! Our school is
> exemplary, but he thinks it should be national
> exemplary....and is really putting the pressure on!

F) Miscellaneous Useful Questions

There were numerous other questions and posts that were hard to categorize but were useful. Probably the largest number concerned the use of technology in the classroom and school setting, whether it was for teacher presentations, students use in computer labs or just the wiring and setting up of computers in schools. One large thread was of teachers sharing in the lack of respect from their administrations and in the need for technology coordinators to establish the technologies in the schools and to train other teachers. This seems to be a larger problem than just receiving funding for computers. There has to be monies for support and training, and this is an ongoing concern.

Example 1:
From: George Cassutto <nhhs@fred.net>
Subject: Using PowerPoint In the Secondary Classroom
Date: Fri Feb 14 21:30:01 1997

Hello Readers,
I tried an interesting experiment in my 9th grade US Government classes last week, and I am interested in your feedback, tips, and ideas. Using PowerPoint, I was actually able to deliver a full-blown lecture on the Civil Rights Movement to 9th graders. They took notes dutifully, engaged in meaningful discussion when prompted by my questions, and generally stayed on-task to a greater degree than if the material had been displayed on a traditional overhead apparatus. In conjunction with the delivery of information by way of the PowerPoint program, which included sound effects and paragraph "building," I toggled between PowerPoint and the World Wide Web, using pre-cached sites to illustrate various historical events such as the Montgomery Bus Boycott, the March on Washington and

the King assassination. Some of these graphics were embedded in the PowerPoint slides, others left on the web. Additionally, I had Microsoft Encarta at the ready for sound clips of the "I Have A Dream Speech" and L .B .J. commenting on the signing of the Civil Rights Act of 1964.

I hope to use PowerPoint more often, but not to the extent that the students will burn out on it. What successes and cautions might your experience be able to provide in order to maintain the edge I think this medium has for secondary Social Studies students?

Thanks for reading this far, and if you plan to hit the reply button, thanks in advance for your input.
George Cassutto
Teacher of Social Studies
North Hagerstown High School (MD)
http://www.fred.net/nhhs (Main Page)
http://www.fred.net/nhhs/html/cassutto.html (Personal page)
nhhs@fred.net
georgec@umd5.umd.edu

Example 2:
From: Ted Johnson <ted.johnson@worldnet.att.net>
Subject: Re: Technology Coordinators - Please help
Date: Sun, 23 Feb 1997 21:58:10 -0800

Chris Zimmerman wrote:
>
> I am researching how different schools handle this
> position. I am currently a first year teacher, and have
> been offered this position for our high school for next
> year. Currently our school pays only $800 per year for
> this position. We have about 160 computers which will
>be networked. Our school has about 650 students as well.
>
>I was wondering what arrangements other school districts
> have on this position. I was thinking that more money
> would be necessary to take the position. But even more
> important was a prep time to work on computers only. (We
> have 8 periods and I have 2 prep periods for 3-4 classes.)
>
> Thanks in advance.
> Mr. Z

Chris: I was asked to apply for our school's new tech position last year. Originally, I would work full-time on the system and staff training, at my current salary level (I would have stayed on the teachers' salary schedule). It then became ½ teaching, ½ tech. It then became full-time teaching, with my being paid for an extra 1 ½ hours (at my regular salary) with another teacher being paid the same to work as my assistant. At this point, I told the principal (nicely) to go away. -:)

As it stands, we still have no tech person.
--
tj
Host, Education Forum on Delphi
tj3@delphi.com
http://www.dusable.cps.k12.il.us/homepages/tedj/gphs.html

Example 3:

    From: holtzp@stillwater.k12.mn.us
    Subject: MacSchool + NetWare
    Date: Tue Feb 11 22:21:05 1997

    Is anyone running MacSchool on a NetWare server instead of an
    AppleShare server? Are there any side effects from doing this?
    --
    Paul Holtz
    ISD 834 - Stillwater, MN
    Technical Support Specialist
    --------==== Posted via Deja News ====--------
     http://www.dejanews.com/   Search, Read, Post to Usenet

G) JUNK Postings

It would be incomplete to show you the newsgroup without examples of the junk that has to be sorted through. Some of these are SPAMs which are indiscriminately sent to numerous newsgroups without any regard for the fact people use newsgroup shopping to read message about particular subjects, of which these SPAMs have no relevance. Other messages include commercial advertisements. Finally, when someone posted just to make trouble, there were two responses:

Example 1:

    From: rhcramer@pen.k12.va.us (Roxanne H. Cramer)
    Subject: Re: School Play
    Date: Fri, 28 Mar 1997 00:32:20 GMT

    I find it hard to believe that a request for information on a school
    play was answered so cruelly. In general, I've found this group
    to be very helpful and supportive. I hope the teacher from
    Mexico does not think we're all such boors!
    Roxanne Cramer

    ---
    rhcramer@pen.k12.VA.US

Example 2:

    From: julnar@dibbs.net (jul)
    Subject: Re: School Play
    Date: Fri, 28 Mar 1997 12:30:24 GMT

    rhcramer@pen.k12.va.us (Roxanne H. Cramer) opined:
    >I find it hard to believe that a request for information on a
    > school play was answered so cruelly. In general, I've
    > found this group to be very helpful and supportive. I
    > hope the teacher from Mexico does not think we're all
    > such boors!

    Yes, John, you should be ashamed...
    jul
    ~~~~~~~~~~~~~~~~~~~~
    "What were once
    vices are now the
    manners of the day."

    Seneca, 4B.C.-65A.D.
    ~~~~~~~~~~~~~~~~~~~~
    DO NOT SEND UNSOLICITED
    EMAIL TO THIS ADDRESS.

CONCLUSION

The newsgroup k12.chat.teacher is a place where k12 teachers gather to discuss their profession and work lives. As such the audience which gathers has a strong degree of common interests and shared knowledge, and the participants work towards the purpose of communication as requesting and imparting information along with discussing specific issues. The newsgroup also demonstrates Licklider and Taylor's vision of the development of a physical network which promotes the social network of connection of people with like interests.

With the lack of additional context in the field or tenor whether body language or context of place, people are learning the importance in the written text and are careful to include situational details. Similarly the lack of observable details of social clues means users have to project their social roles and position to help define the tenor of the communication. The discussion between parents and teachers highlights some of this. What roles do each play, and how can they come to communicate on an comfortable and equal level?

The many conversations simultaneously ongoing allow the reader to chose from the variety and range of concerns of the teaching profession. If you think of a teacher just beginning or looking for a job, the newsgroup offers a rare glimpse into the actual situation of teaching. For the experienced teacher it offers a place to share in the problems and frustrations of the situation. And for teachers who feel successful, a place to share those successes with others who might find they are interesting or useful in their own classrooms. Essentially, the k12.chat.teacher newsgroup allows for the collective gathering of educators so that they do not feel alone in their situation. But the newsgroup is currently only an embryo of the possibility - as it is doubtful its importance is recognized by school administrations, or even if access is made readily available to teachers. However, hopefully by spreading knowledge of the group, teachers will grasp the importance and push for access and time to be made available.

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Norbert Wiener, J.C.R. Licklider and the Global Communications Network

by Jay Hauben
jrh29@columbia.edu

In the last quarter of the twentieth century a new global communications network emerged with a growing effect on most aspects of human society. In the events that launched and nourished this network a prominent role was played by J.C.R. Licklider. He not only envisioned a great leap for human society based on a tight coupling and networking of people and computers, he did much to infect others with his early enthusiasm. He also set in motion a public sponsorship and funding mechanism that brought the communications network he envisioned into reality. In the 1960s, Licklider published two seminal articles: "Man Computer Symbiosis"[1] in 1960 and "The Computer as a Communications Device"[2] written with Robert Taylor in 1968. Looking for the intellectual roots of these papers and Licklider's vision, at least one researcher[3] was drawn to the work of Norbert Wiener. This article will look at some of the related work of Norbert Wiener and J.C.R. Licklider.

Norbert Wiener began his teaching and research career at MIT in 1919 at the age of 24. He distinguished himself with original contributions in mathematics and in the connection of mathematics with physical systems as in his study of Brownian motion. Perhaps he is best known for what he called "the science of cybernetics or the theory of communication and control in the machine and in the living organism."[4] Wiener traces the cybernetic synthesis connecting engineering and neurophysiology and his insights about communication to his work in the 1940s related to anti-aircraft predictors.

In connection with World War II, Wiener undertook to analyze the problem of improving the success of anti-aircraft fire. An anti-aircraft gunner must shoot ahead of where his target is at the time of firing. The amount and direction ahead must be estimated quickly and accurately. Where to aim is based on knowledge of how the plane has been traveling and where it is likely to travel in the time

the shell takes to reach it even if the pilot takes evasive action. Wiener was able to contribute to the solution of this prediction problem partly because he had previously developed the equations to be solved when knowledge in one region is used to predict behavior in another (Hopf-Wiener). Wiener was also familiar with the work at MIT of Vannevar Bush with analog computers. Putting the pieces together, Wiener envisioned the direct coupling of anti-aircraft guns with radar detection and automatic aiming based on his mathematical solution of the prediction equation. Motors attached to the gun turrets could position and aim the gun under the control of data generated by the mathematical processing of input from radar. In fact, as radar became perfected the process was mechanized to the point where the human element could be eliminated from anti-aircraft gun aiming and firing. Wiener reports that his work on this problem had a profound impact on him.

Up until this work, the servomechanisms for the control of gun turrets were always assumed to belong to power technology rather than communications technology. What dawned on Wiener was that the action of the motors could be conceived valuably as communicating the aiming parameters to the turret and hence that the motors and the computers controlling them could be treated as communications devices. Wiener wrote that this point of view made him "regard the computer as another form of communications apparatus, concerned more with messages than with power."[5] In addition Wiener saw a striking analogy between the workings of an automatic anti-aircraft system and that of a living organism. There was input, processing of that input, and resulting response. He began to regard the brain and the nervous system in much the same light as a computing machine. Out of such considerations a new synthesis emerged which Wiener eventually termed cybernetics (from the Greek word for "steersman"). As the communications and engineering consequences of Wiener's new ideas were worked out, he began to predict that the series of analogies between the human nervous system and the computer and control systems would lead to the possibility of a very high level of automation.[6]

In 1944 at Princeton University, Wiener gathered a group of neurophysiologist, communications engineers, and computing machine people for an informal session to layout some of his thinking. He found a willingness on the part of the members of different disciplines to learn what others were doing and to see the striking similarities. Encouraged by this gathering, there was

support for Wiener to launch two series of similar interdisciplinary sessions, one in New York City and the other in Cambridge, MA. He also worked out his new synthesis in *Cybernetics or Control and Communication in the Animal and the Machine* (The Technology Press, 1948; MIT Press, 1961) and later popularized it in *The Human Use of Human Beings* (Houghton Mifflin, 1950).

Wiener's work raised an important question. What should be the relations between people and machines in the age of automation? He called for an "independent study of systems involving human and mechanical elements to decide which functions should properly be assigned to the two agencies, human and machine."[7] Wiener also worried that automation would lead society to unbearable unemployment unless it was carefully implemented with full concern for the working people.

Communication was the unifying thread in Wiener's synthesis. He concluded that "communication is the cement of society. Society does not consist merely in a multiplicity of individuals meeting only in personal strife and for the sake of procreation, but in an intimate interplay of these individuals in a larger organism."[8] It was in the strengthening of this larger organism via the improvements in communications that his hope lie that the problems also generated could be solved. He therefore sought to "bring to the attention of all the possibilities and the dangers of the new developments."[9]

After WWII, Wiener's ideas began to be known and discussed in scientific and technical circles. When asked in an interview in 1988 where his interest in digital computers came from, J.C.R. Licklider answered, "There was tremendous intellectual ferment in Cambridge after WWII. Norbert Wiener ran a weekly circle of 40 or 50 people…. I was a faithful adherent to that."[10] He added that, even though he was a researcher and faculty member at Harvard at the time, he audited a seminar given by Wiener and participated in an MIT faculty group that discussed cybernetics. The weekly circle launched by Wiener in 1948 that Licklider attended with his colleagues Walter Rosenblith and M. Fred Webster was know as the seminar on scientific method.

On the way home from each dinner meeting, Licklider and his friends critiqued what had been presented and discussed and shared with each other what from their different disciplinary perspectives

each had understood.

In 1950 Licklider left Harvard to join the MIT faculty and research community of which Wiener was a part. Licklider described himself as "an experimental psychologist interested especially in how the brain works in conjunction with hearing, but also in speech and communication and human engineering."[12] At MIT he participated in two summer studies sponsored by military branches which gave him "an opportunity…to hear of computers and radar sets and communications."[13] His own work, very much in the Wiener tradition, was split into psychology, acoustics and electronics. His efforts to try to model how the brain works in hearing with an analog computer convinced him he really had to learn digital computing. Licklider left MIT in 1957 to work at the acoustic consulting firm of Bolt, Beranek and Newman (BBN) where he was promised access to digital computing. However he maintained his ties with MIT and its scientific and technical community and participated with Norbert Wiener and others in many important events there like the 1961 MIT Centennial Celebration.

At BBN, Licklider undertook a small research project that was to lead to his answer to Wiener's question of the future relation between people and computers. Licklider did a mini time-motion study of the activities during the hours regarded as devoted to work of a technical person. Although he was aware of the inadequacy of the sampling, he wrote, "I served as my own subject." He found that 85% or more of his "thinking" time was devoted to clerical or mechanical chores: searching, calculating, plotting, transforming, determining the dynamic or logical consequences of a set of assumptions or hypothesis, preparing the way for a decision or insight. Having had the opportunity at BBN to sit at an interactive computer for four or five hours on a regular basis, Licklider drew the conclusion that it should be possible to create a flexible relationship via programming and interface devices between a person and a computer so that both could contribute what it does best to the accomplishment of mental work. In "Man-Computer Symbiosis", he presented his conclusion that "in not too many years, human brains and computing machines will be coupled together very tightly and that the resulting partnership will think as no human brain has ever thought and process data in a way not approached by information handling machines we know today." Licklider's vision was different from that of the computer becoming a servant for people or an extension of a person's abilities and different from the long range goal of artificial intelligence researchers that the computer would one day replace or supercede human thinking. Wiener had also foreseen a people-computer partnership. For example, Wiener envisioned a computer programmed to translate from one language to another whose output would be filtered through a human translation expert. The human would make sure that the translation made sense in the final language. This expert might then reprogram the computer to do better or devise exercises for the computer from which it could learn to make improved translations. Licklider was carrying this prediction further by suggesting that computers could be involved in the formulation of questions and in the process of thinking and working through to their solution. The human would handle very low probability situations, propose hypotheses, and make unusual connections; the computer would convert hypotheses into testable models, retrieve information, create simulations, etc. Most of Licklider's article laid out research tasks that needed to be accomplished in order for this vision to be realized. These included the need to achieve better computer memory capacities, to network and internetwork computers, to develop graphical and audio interfaces and for languages that facilitated learning by both humans and computers. These research tasks were to make up much of the research agenda of the newly emerging discipline of computer science. Licklider put forward that agenda and then as director of the Information Processing Technologies Office of the Advance Research Projects Agency (ARPA) fostered it by arranging for its public support and funding.

Besides taking up the question of the human-computer relationship raised by Wiener's work, Licklider together with Robert Taylor investigated the implications of Wiener's insight that computers were communications devices. For Wiener, communication was closely linked with control: to manufacture a car, for example, people could communicate with a computer via programming. The computer could then communicate the motions necessary to assemble the car to the tools via servomechanisms. The tools in turn would respond with motion and feedback. This was the automation revolution which Wiener's experience with the anti-aircraft problem helped him to foresee. In "The Computer as a Communications Device", Licklider and Taylor look for

how the computer will help people do more than send and receive data. Their emphasis was deliberately on people. They saw the possibility that communication would be dynamic. "When minds interact new ideas emerge" they wrote. They saw that the programmed digital computer helped create a medium that is plastic, can be modeled, where premises could flow into consequences, and "above all a common medium that can be contributed to and experimented with by all…. Its presence can change the nature and value of communication even more profoundly than the printing press and the picture tube, for…a well-programmed computer can provide direct access both to informational resources and to the process for making use of resources."[14] Licklider and Taylor argued that when information transmission and information processing are combined and available on networks of computers cooperation, collaboration and coherence are much more likely to occur than among isolated researchers. By making possible quality transmission and processing of information among geographically separated people, there would follow the creation of communities not of common location but based on commonality of interest that would be large enough to support comprehensive accumulations of people, data and programs. Like Wiener, they saw great benefit to society as a result of the communication revolution made possible by the digital computer and the global computer network. But also just as Wiener warned of the danger of unplanned automation, Licklider and Taylor included in their article a warning: "For the society, the impact will be good or bad depending mainly on the question: Will 'to be on line' be a privilege or a right? If only a favored segment of the population gets a chance to enjoy the advantage of "intelligence amplification," the network may exaggerate the discontinuity in the spectrum of intellectual opportunity."[15]

Licklider and Taylor's article in 1968 ushered in the great experiment that began in 1969 as the ARPAnet and that we know today as the Internet.

In summary, in the 1940s Norbert Wiener developed a synthesis that stressed the importance of communications. The ideas and questions raised by him fueled an intellectual ferment in and around MIT. J.C.R. Licklider and other time sharing and networking pioneers took part in that ferment and in the intellectual and technical community at MIT and the greater Boston area which contributed so much to the technological developments of the second half of the twentieth century. It is not a surprise that there would be a connection between the cybernetics synthesis that Wiener introduced and the contributions of pioneers like Licklider. That a new global communications network exists today is a tribute to Wiener and to Licklider and the other pioneers who developed the original insights into a promising advance for human society.

Notes:

1) J.C.R. Licklider, "Man-Computer Symbiosis," *In IRE Transactions on Human Factors in Electronics*, Vol HFE-1, March, 1960, Pp. 4-11. Also reprinted in "In Memoriam: J.C.R. Licklider: 1915-1990, Report 61", Systems Research Center, Digital Equipment Corporation, Palo Alto, California, August 7, 1990, pp. 1-19.

2) J.C.R. Licklider and Robert Taylor, "The Computer as a Communication Device," In *Science and Technology*: *For the Technical Men in Management*, No 76, April, 1968, pp. 21-31. Also reprinted in "In Memoriam: J.C.R. Licklider: 1915-1990, Report 61," Systems Research Center, Digital Equipment Corporation, Palo Alto, California, August 7, 1990, pp. 21-41.

3) See Ronda Hauben, "Cybernetics, Time sharing, Human-Computer Symbiosis and Online Communities: Creating a Supercommunity of Online Communities," chapter 6 in *The Netizens and the Wonderful World of the Net: On the History and the Impact of the Internet and Usenet News*, Michael Hauben and Ronda Hauben, online manuscript, January 10, 1994, URL http://www.columbia.edu/~hauben/netbook/

4) Norbert Wiener, *I Am A Mathematician: The Later Life of a Prodigy*, The MIT Press, Cambridge, Massachusetts, 1956, p. 269.

5) ibid., p. 265.

6) ibid., p. 275.

7) Norbert Wiener, *God & Golem, Inc.: A Comment on Certain Points Where Cybernetics Impinges on Religion*, The MIT Press, Cambridge, Massachusetts,

1964, p. 71.

8) *I Am A Mathematician*, p.326.

9) ibid., p. 308.

10) *Interview of J.C.R. Licklider* by William Aspray and Arthur L. Norberg, tape recording, Cambridge, Massachusetts, 28 October 1988, OH 150, Charles Babbage Institute, University of Minnesota, Minneapolis, Minnesota.

11) "The Legacy of Norbert Wiener: A Centennial Symbosium," Cambridge, Massachusetts, 1994, p. 19.

12) "The Project MAC Interviews" by John A. N. Lee and Robert Rosin, in *IEEE Annals of the History of Computing*, vol 14 no 2, 1992, pp. 15-16.

13) ibid., p.16.

14) "The Computer as a Communication Device," p. 22.

15) ibid., p. 40.

[Editor's Note: February 11, 1998 marked the tenth anniversary of the *Amateur Computerist*. Following are the Tables of Contents of all the issues from our first 10 years.]

Amateur Computerist Index