Remarks of Professor Eben Moglen
AALS Mini-Workshop on the Internet and Legal Scholarship
New Orleans, Louisiana, January 5, 1995

Ladies and Gentlemen:

It is a great honor to be asked to speak at this session, and I very much regret that ill-health prevents me from being with you in person. It is a sobering reflection that no technological reorganization of scholarship has so far made it possible to avoid holding our professional meetings in the flu season.

In the prefatory remarks printed in the program I tried—in my role as a legal historian interested in the effect of information technologies on the history of the common law—to put our subject today in a historical perspective. I shall return to that attempt below, but let me state briefly what I regard as the two most important points. First, the changes in the technology of human communication now occurring are the most basic since the invention of writing more than five thousand years ago. Second, the social changes brought about by this revolution in the production and distribution of information will have their earliest effects on scholarship, which is the organized production of specialized knowledge.

But precisely because our generation stands at the inception of the revolution, prediction of the larger contours of the forthcoming changes is extremely difficult. Because it has been my lot to study the history, to help create some of the technology we now see around us, and to know some of the "crackpots" whose long-shots are now crossing the finish line well ahead of the field, I hope I can go some small way in these remarks toward a unified vision of the process through which we are living.

I have three different strands of thought to put before you. The first concerns the media of scholarly communication: past, present and near future. I shall describe how the current state of the network reflects the transformation of the media of the past, and the existing spectrum of possibilities. Second, I shall describe the current state of scholarly communication in our discipline, which I find to be about as awful as can be imagined. I shall argue that the absolute mess we call "the law reviews" is an asset in disguise. The evident inutility of the law review system frees us, as not all other scholarly disciplines are free, to consider the wholesale replacement of our existing publication system. Third, I shall speculate, in terms of existing technology, on the possible shape of the replacement system, including some comments on the negative consequences of the current technological and legal climate. (The previously initiated will recognize these as the anarchist portion of my remarks.) Finally, I shall attempt to provide a general vision of the work of legal scholars at the end of the next generation, describing how what we do today will determine what our successors will be doing in the second quarter of the next century.

I. The Law Professor as Pigeonhole Sorter

Scholars are prisoners of their data structures. This statement may seem a trifle obscure, but I believe its content should be readily recognizable. The organization of information determines what kinds of learning are practicable given limited time and resources. In addition, the prevailing systems of information organization give rise to the social customs that define what kinds of scholarly activity are appropriate and useful. Until the beginning of the digital revolution, "data structures" meant primarily the physical organization of written information. How data were preserved affected what could be learned. For the authors of the book we call *Bracton*, for example—working in the middle of the 13th century—information about the laws and customs of England was contained—in dilute sequential form—in the mass of the plea rolls, to which they had preferential access. Scholarship, in that context, meant epitomizing the plea rolls, to communicate to others in compressed form how their contents did and did not reflect the more familiar conceptual categories of the Romanized European law.

To a significant extent, our legal scholarship has remained fixed within this model of converting sequentially-stored dilute information into useful epitomes conforming to the intellectual prepossessions of the era. Littleton, Coke, Blackstone and Story—as I labor to make my students understand in my seminar on the intellectual history of the treatise tradition—all attempted to articulate the loose bones of the English law into a skeleton recognizable given the fashions of the time. Though the forms changed significantly with the eras, each of these types of scholarship was aimed at overcoming the same fundamental constraint. In modern jargon, the material of the law is produced and stored sequentially; the primary goal of legal scholarship has been to access that material associatively, by linking temporally displaced segments in topical relations. The scholar, however awkward it may sound, has been a specialized device for the performance of a sort and merge operation, either using internal memory or sorting externally, using whatever equivalent his generation offered for the three-by-five card.

If the information-theoretic significance of scholarship did not much change between the time of Bracton and our contemporaries, the primary problem in the intellectual organization of the law has been to get the scholar to the raw data to be sorted. In the beginning, as with those of us who must still make annual journeys to the English Public Record Office, the solution was to move the scholar around.

Since the European adoption of movable-type printing at the end of the 15th century, however, the technical infrastructure of scholarship has largely depended on the hope that the distribution of books could replace the peregrinations of scholars. Scholarship became, as much as possible, the consultation of static volumes of printed information, or the rendering of unprinted information suitable for reprocessing by the printing press. The emphasis was still upon making associative links between previously compiled sources of more dilute information.

Along with the process for consultation of sources, scholarship has consisted also of the process for consultation of other scholars. This meant either personal travel or the exchange of written correspondence until the development of technologies for voice transmission at the turn of the twentieth century. As we all know, however, the telephone has been more of a barrier to scholarship than an assistance, and only the development of the answering machine, I think, has prevented the telephone from extirpating scholarship altogether.

So, let us now consider what has happened to the media of scholarly communication. In principle, the infrastructural problems that have beset scholarship for one thousand years can now be eliminated. Already digital media directly replacing older analog media are coming into existence. Email is replacing the point-to-point media such as snail mail and telephone calls. Broadcast media—including primitive list servers and the more sophisticated structure of Usenet news—are beginning to serve some of the purposes previously served by scholarly pilgrimage, including organizational meetings, collaborative inquiry, exchange of notes and queries, and the like. Unfortunately, the poor design and low quality of commercial software threatens the vitiation of these new media, a point to which I return below.

In addition to new media of personal communication, the network has begun to resolve a few other problems of data organization. The linking of library catalogs has made traditional bibliographic research a trivial task.

The fulltext retrieval services, though inadequate in many important respects, have at least rendered the basic sources of most legal scholarship accessible from anywhere in the world where a pair of copper wires is connected to a telephone switching office. Experiments with more extensive digitization of library collections, such as Columbia Law School's Project Janus, may within another generation make possible the global frictionless consultation of the entire existing body of our legal culture. Here the primary impediment is mindless adherence to the antiquated conception of "intellectual property," to whose well-deserved destruction I shall return in a few minutes.

But these new media are not just inadequately implemented in the existing technological and legal context. While they substantially reduce the friction in scholarly communication, avoiding the need to move people to data, they are not designed to solve the other primary problem that has beset the scholarship of the past. Even given email, netnews, automated catalogs and the virtual library—and assuming away the ridiculous limitations on use posed by rules protecting the non-productive middlemen called publishers—the scholar is still engaged in using carbon-based intelligence to make static links among existing sources, thus predetermining the obsolescence of her enterprise in the face of future developments. We are still the prisoners of outmoded data structures, and it is time to reconsider the essence of what we do. As Albert Einstein said, our experience in the 20th century is that everything has changed except the nature of men's minds. Fortunately, what we do has become so altogether foolish that it should not be difficult to change.

II. From the Primordial Slime to the Current Mess

One of the first achievements of the new information technology was to destroy completely the utility of our professional publications. It will not have escaped notice, I believe, that the number of law reviews, the size of their issues and the length of the individual contributions has increased in precise correlation to the spread of the new technologies. Taken together the photocopier, the word processor, cold type and desktop publishing have rendered the law reviews an acrid heap of unreadable tripe. Unlike high-energy particle physics, which conducts one of the most intellectually sophisticated inquiries on the planet using four journals and an abstract service, or even all of physics, which makes do with less than one hundred major journals, American law professors *alone* believe that their agglutinated sapience cannot be contained within less than some *six hundred* separate publications. All but a small minority of these lack any subject matter limitation, and all but an even smaller minority are under the editorial direction of the least-educated part of the legal culture, whose editorial interventions are largely directed at making things longer by adding to each individual publication lengthy elucidations of the evident. The scholar who first said that the primary asset of the specialist was a firm grasp on the obvious has no intellectual progeny among our student heros and heroines of the law review circuit.

Nor have our students been alone in the ruination of our professional literature. In your institution, as in mine, there are colleagues whose primary metric of scholarly activity is pounds per year. They think for a week, they write for a month, they publish a bloated and hastily-considered version three months later in a law review desperate for editorial material to justify 1600 pages per volume, and a year later everyone has forgotten what they said, including themselves. For such people, I believe, the printing press was a poor invention. Publication in cuneiform, on baked clay tablets, would have made the pounds per year ratio rise without a concomitant wastage of the time and effort of those who feel socially compelled to read all this baloney.

To the problem presented by the abysmal organization of our professional literature, the new technology has evolved no solution to offset its role as accessory before the fact. The finding aids available on the network are only slightly better than those previously available in photoreduced form; indeed, they are essentially digital equivalents of the old indices. The fulltext retrieval services devote gigabytes to the storage of law review articles, but one hopes that before the wreckage reaches terabyte levels someone will realize that there is no satisfaction in scrolling online through a 150-page article with 800 footnotes by an apprentice genius who has been told that 100 pages is insufficient for tenure. It is not my present purpose to confront directly the problem of the hypertrophy of theory in contemporary common-law scholarship. My more limited point here is that the channels of professional communication have been dangerously clogged, to the point at which, I believe, many people have simply stopped reading the reviews altogether without admitting it. The process of attempting to simplify and elucidate the dilute materials of the law by publication of secondary scholarship in the law review mode is no longer working. Sixty years after Fred Rodell first bade farewell to law reviews it is time for us to rise up in wrath and smite the Philistines who in the interest of self-aggrandizement destroyed our literature. Let law reviews perish forevermore!

But can the network provide an appropriate alternative for the resuscitation of legal scholarship? The answer is most certainly yes. The first step is the elimination of publication as presently understood. Placing on the network a version of my work in a portable page-description language (such as PostScript) allows anyone caring to read my scholarship, whether online or in a permanent form, to receive it with no loss in production values over the present system of physical reproduction. The digital broadcast media like netnews and the listservs, or their more usable successors, will then replace the existing finding aids.

But we will do more by network publication than saving the costs of law review publication and reversing the noxious effect of the middlemen on the culture of scholarship. Network publication will for the first time directly confront the static quality of all prior scholarly data structures. Placing my work in the net means that I can continuously revise and expand it. In addition, our cumbersome citation mechanisms can be replaced by direct active links to other materials on the net, so that the footnote—which is surely the bane of legal scholarship—can be replaced by proliferated cross-linkages of the kind primitively modeled in the current world by the citation links of the commercial fulltext systems, and slightly more sophisticatedly by the existing webform hypertext formats, such as the World Wide Web. Such links can be created by machine control as well as human intervention, so that case citations, legislative updates, and other purely mechanical incorporations can occur without my having to do more than make occasional editorial foray to prune back the accretion of new links.

The webform systems also model for us, in a fairly simple way, the unprecedented opportunities for collaborative work that the network has created. Within the next generation we shall see the successors of the webform hypertext systems facilitating collaborative projects in the humanities on a scale previously only dreamed of. The conception of the History Workshop or the Sixieme Section will be revitalized, for example, along with kindred conceptions in many disciplines.

For the common lawyers, too, limitations in place for centuries will suddenly give way. The low quality of the common law's encyclopedic sources, largely the consolidated output of headnote writers working like Grub Street hacks for the booksellers, should be replaced by a far richer literature, achieving the breadth of scale of the Romanist tradition without its limited conceptual categories. Primary sources, commentary, counter-commentary and scholarly debate should all be joined in a single dynamic web, collaboratively edited. Our contributions to this web will be much less bulky than our existing screeds, reflecting the higher priority given to the making of links over the self-assertive announcement of one's own brilliant conceptualizations. But the result will be finally to concentrate the activity of scholars where the need has always been: on the human mind's unparalleled capacity to connect apparently disparate materials. This is what carbon-based intelligence is for; the rest, may I say, is silicon.

III. Breaking Windows: Let My People Go

But all is not skittles and beer. Everything I have said this afternoon—save for my unmannerly pasquinades directed at the dinosaurs of scholarship whose extinction I am vulgarly cheering on—was first conceived almost thirty years ago by visionaries such as Theodor Holm Nelson, whose forgotten work *Literary Machines* will be seen in the next century as the first real description of the revolution in human thought. My vision is only slightly improved over that of the unrecognized giants on whose shoulders I have so far stood. In the meantime the boxbuilders have started to catch up with the visionary designers, and the dispersal of computing power onto every flat surface on the planet continues apace.

But the baneful influence of the dwarfs has by no means been eliminated. The positive scholarly consequences of the digital revolution are impeded in two directions, by technological design so bad as to be ludicrous and lugubrious at once, and by the malevolent consequences of an intellectual property system that bids fair to outlive by lifetimes the system within which it originally functioned.

Let us begin with the technological difficulty. Pre-eminently the problem can be phrased this way—the global software industry has decided to reduce scholars to the effective mental level of morons, and they are flocking to embrace the degradation with open arms.

Because we are the first generation of scholars to live in a world of computers, our understandable fear of the technology is used against us. The target is the most valuable possession of human culture—language. Believing that any linguistically rich environment for interaction between people and computers will be commercially unpopular, the designers of operating systems want us to live in an infant's world. They show you pretty pictues, and in order to communicate you point at the appropriate picture and grunt.

A more perfectly ironic revenge of the second-rate it would be impossible to imagine. A billionaire geek in Redmond, Washington evens himself up with the university world, in which he was notably unsuccessful, by reducing the world's intellectuals to the linguistic level of *Autralopithecus robustus*, and is rewarded with the possession of the notebooks of Leonardo Da Vinci.

Much more is at stake than the fact that, like Sisyphus, you will spend eternity rolling your trackball up hill. The shibboleth of usability is beginning to make the technology of intellectual liberation a prison of a particularly pernicious kind.

Let us take the simplest of our facilities: email. I have watched in two different institutions in the past twelve months as faculty demand for "fancy" email facilities militated for the adoption of monstrosities that provide lots of pretty pictures, elaborate twirlers, zillions of pull-down menus—in short, an environment made for rodents. And it looks good too, to the faculty committee each of whose members thinks he's had a busy day if he gets ten email messages. But that's not the world of 1998, let alone the world of 2015. Increase the volume of email exponentially for a few years, as happened at Columbia Law School when every student was given an email account and the administrative business of the institution began to migrate into the mailstream, and these programs are a deathtrap. Pointing and grunting at a few messages is fine, but when your email volume reaches 300 messages a day, as mine did several years ago, you will run out of breath to grunt and time to point. Suddenly you will start to wonder why all the vaunted intelligence of your computer isn't performing *linguistic* analysis of your mail. Some should be answered automatically, some should be filed for future reference according to criteria of your own, some should be forwarded to more appropriate recipients, etc. Oh, it can be done. I do it now. Try sending me an email complaint about your grade on the Property exam between the months of June and September and see what comes back. But don't expect Billy the Buccaneer to do any serious thinking about it before the Chicago version of Microsoft® Mail.

The linguistic content of computer interaction, like the dialogue quality of Hollywood movies, is being debased at a rate whose X-intercept seems only milliseconds away. I recently spent a day helping a co-author edit an article that had been written using a popular Windows® word processor. Rather than using the rich symbolic environment of the keyboard to perform editing, the designer has trapped the user on a rodent treadmill, in which every operation requires two or three clicks and a lot more than one big drag. For purposes of comparison, I wrote down all the revisions that it took one hour to perform, and then compared the number of keystrokes required to perform the same tasks using GNU Emacs, a freeware text editor available at no cost to everyone on the planet thanks to the dedication of one man—Richard Stallman. That hour of rodent movement could have been reduced to ninety-six keystrokes, requiring conservatively two minutes of operator time. A 3000% penalty in time and frustration is too much to pay for all the pretty pictures.

The tools of scholarship have always required long educations to master, and the network and its workstations are no different. Proper use of a research library is a skill that takes years to acquire. A distinguished Roman legal historian recently said to me "No Romanist is ready to do really important work until he is fifty; it takes at least that long to master the literature." What was not built in a day cannot be understood overnight. Unless our computer environment is linguistically rich, we will not be able to employ successfully the pre-eminently linguistic tools of our trade. Instead, the quack nostrums peddled to allay the disquiets of this transitional generation are being passed along to our children, who we can only hope will escape their influence. If scholarly work in the humanities is to capture the benefits of the computer revolution, we must counter the anti-linguistic bias in the present technology. My message is: If you don't break the windows, you'll spend your life in a mousetrap.

The technical obstacles to the digital revolution in scholarship are small compared to the oppressive deadweight of the intellectual property system, a tripartite oxymoron like Voltaire's Holy Roman Empire. Let us return for a moment to the webform hypertext systems and network publishing, about which I was speaking a few minutes ago. Who owns what part of this web of text, in which each item is interspersed with links to hundreds or thousands of others? One of the most important aspects of network publication is that it allows us to rid ourselves forever of the leeches who have battened off the intellectual substance of the Western world since Gutenberg. Publishers were an artifact of the industrial period in the information economy. The law of copyright is the coprolith that will mark their passage in the fossil record. Yet one has only to read last year's report of the Working Group on Intellectual Property of the National Information Infrastructure Task Force to recognize how profoundly we are caught in the mental trap of protecting the publisher's right to profit from his purely industrial role in the distribution of information, even as the industrial component of the work we do is on the point of vanishing forever.

Even from my sickbed in Amsterdam I can hear the rumbling at this point. Somewhere in the audience there is an econodwarf preparing to explode. He is rocking back and forth in his chair, knotting his pocket handkerchief, meditating his tantrum. “What,” he is planning to scream, “what about the incentive to produce? Who will make scholarship if his property right is unprotected?” Find him now and give him a peppermint, before he ruins the most important liberation movement in human history. Not even Bill Gates is as tedious as the econodwarf once the shouting begins. Not for an instant before starting his nonsense about incentives does he consider that no one in the United States receives significant direct remuneration from law review publication, and that the indirect remunerations are sufficient to produce far more blather than we absolutely need. Moreover not even the econodwarf can believe, for example, that the West Publishing Company only puts page numbers at the tops of the pages because the Eighth Circuit says they can copyright the numbers. Indeed, the whole discussion of incentives is a trap—the crushing weight of a dead metaphor flattening our skulls. It’s time for an alternate metaphor, appropriate to the next epoch of human history. It began on the afternoon when Faraday first noticed what happens when one wraps a coil of wire around a magnet. Never again did we ask what incentive there is for electrons to flow in the wire. So I offer you Moglen’s Corollary to Faraday’s Law: “If you wrap the Internet around every brain on the planet, knowledge flows in the network.” That’s induction, and the only question is, what is the resistance of the wire? Resistance, according to Moglen’s Corollary to Ohm’s Law, is directly proportional to the field strength of the intellectual property system. Neither of these corollaries is my property, and you may copy them freely and without credit. I say, “resist the resistance.”

The foregoing concludes the anarchist portion of this talk. We now return you to the regularly-scheduled transcendental nonsense brought to you by Warner Communications and the Section on Copyright Law. But first, a word from the future.

IV. Conclusion: the Virtuous Virtual Legal Scholar

So, what if we go home and break all the windows, insisting on computers that participate fully in the crowning glory of human culture—the making of language? What if we drive the moneychangers from the temple, refusing to constrain our data structures and our network within the boundaries prescribed by the subsidy for obsolete industrial technology represented by the copyright system? What will the world of our intellectual future be, that we should make so much fuss about it?

We will be a great deal closer to one another, as our experience with the present primitive network media already shows. Our work will be more tightly integrated, in ways I have already tried to describe, in an environment in which the distinctions between research and publication will have shifted significantly, and collaborative enterprises on a previously unmanageable scale will be an important part of most scholars' lives.

But in suggesting these properties of our future work in the environment determined by new data structures, I should not want it to be supposed that I also believe our brave new world will be one of lessened individuality. On the contrary, the technology, when properly applied, will allow us to join the cultivation of our minds to the process of scholarly communication more seamlessly, and more usefully, than ever before.

Let us consider, for a moment, that very primitive hypertext starting-point, the personal home page. If you look at the home pages now beginning to populate the network you will see lots of pictures of peoples' dogs, hot lists, and some pointers to the future the size of grass seed. But they will grow.

The home page is a very restricted example of the virtual personality, a form of communication that has no analog in the world outside the network, except that most precious and most endangered of resources—conversation. Through our conversation with those who share our deepest interests we learn not only about the experience and information they have acquired in the course of their lives, but also about the idiosyncratic, serendipitous, revelatory connections they have made. The central, almost uncapturable beauty of human intelligence is its fertility in unexpected juxtapositions. So much of human intellectual progress arises from those epiphanies of life, just as so much is lost by their frailty. The works of literature that reveal the richness of the cultivated mind—the *Essays* of Montaigne, Burton's *Anatomy of Melancholy*, Robert Merton's *On the Shoulders of Giants*, and in our own literature John Selden's *Table Talk*—will never die. Yet their composition is a rarity, and their form too, no matter how adventitious or Shandean in structure, is fixed forever by the confinement of print.

Consider what our world would be if each of us—through a lifetime of reading, study, and the making of gloriously improbable connections—were leaving behind a work of this kind, not fixed in a single version, but rather available for consultation down its myriad of paths at any time, by anyone, for as long as the network endures. The fruits of our reading, the winding track of our thoughts, our speculations and uncertainties—a joinder at last in communicable form between what we merely know and who we are. This is the *agora* in which we shall sit, long past the day of our own demise, to form a part of humanity's evolving mind.

Have I come so far from what we can presently do? Not really so far at all, once the sources we consult, the notes we take, the course of our correspondence and the body of our formal written work all begin to converge within the linkage structure of the net. Others must imagine what the effect will be for musicologists and composers, philosophers and poets, sociologists and yes, even economists. Or rather, these boundaries too will lose some significance, for the cultivation of a learned personality is the search for wisdom, and the wise are not contained within bailiwicks. At all events, I can only feel, however distantly, the effects upon the scholarly literature I most intimately love.

I hope that we shall all live long enough to populate that throng. The steps that we take now, in the dawn of all our new instruments, are very small. But we must travel the beginning of the road with our goal in mind. If not we will be sold a bill of goods at starting by a huckster who believes that his sales to multinational haberdashery conglomerates indicate the proper design for tools to shape the future of the human mind. Or else we will be indefinitely delayed while we pay egregious tolls to those whose primary concern is the future of syndication payments for *Cheers* reruns. The history of our century is the history of the perversion of the media of communication for the transmission of ever-larger volumes of bilge. Vigilance and commitment are the price of permanent intellectual liberation. Thank you.