

Chicago-Kent College of Law

From the Selected Works of Ronald W Staudt

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An Essay on Electronic Casebooks: My Pursuit of the Paperless Chase

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AN ESSAY ON ELECTRONIC CASEBOOKS: MY PURSUIT OF THE PAPERLESS CHASE

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I. INTRODUCTION

This Essay discusses electronic teaching materials in law with a special focus on the most common teaching tool in American law schools today, the casebook. To set the stage for the discussion, the first section describes the technology setting in law from which an electronic casebook might emerge. Next, I offer a pedagogical vision that points to important advantages that might be expected of electronic casebooks linked to other electronic texts. In the last three parts of the Essay, I sketch the progress of my efforts at Chicago-Kent to build and use electronic teaching materials in law. These efforts culminated in a course that I taught in the fall of 1992 with a computer based casebook in a networked classroom without a printed casebook of any kind.

II. INFORMATION TECHNOLOGY AND THE LAW IN THE UNITED STATES: AN OVERVIEW OF AN EMERGING MARKET FOR ELECTRONIC CASEBOOKS

Since 1986, the Center for Law and Computers of the Chicago-Kent College of Law has conducted a survey of the use of computers by the 500 largest law firms in the United States. We study law firms to help keep our educational programs relevant and to offer information to the profession itself on the progress of information technology. Our focus

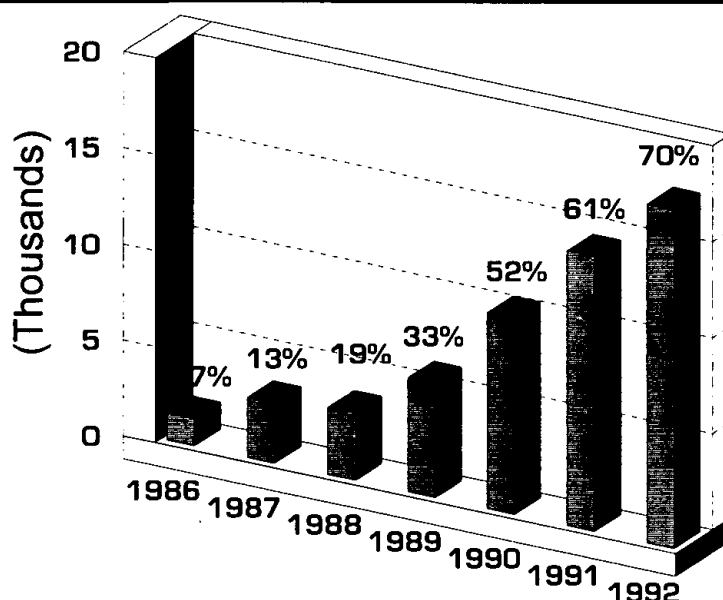
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I am grateful for the advice and encouragement of a growing group of colleagues at law schools across the country and around the world including the attendees at the Second International Conference on Substantive Technology in the Law School held at Chicago-Kent in July, 1992, numerous board members and law school representatives from the Center for Computer Assisted Legal Instruction, and the Executive Committee and Manager of the National Center for Automated Information Research. I especially valued the help and comments of William Andersen, William Boyd, Peter Martin, Henry Perritt, Rosemary Shiels and Joleen Willis. The projects described here would have been impossible without the programming expertise of David Kiefer. My Computer Law students have been terrific. David Johnson is always an inspiration; he remains two steps ahead of all of us no matter how hard we run. Brennon Holmes, Leslie Slater and Kay Gemrich provided valuable research assistance in the preparation of the computer law electronic book and this Essay.

Despite all of these acknowledgements, the errors and omissions are mine.

has always been on the use of computers by the lawyers themselves, rather than the back office activities of time and billing, accounting or personnel management. A cursory view of the results of the last seven surveys shows the overwhelming acceptance of computers as personal productivity tools by lawyers in the large firms.

Attorneys with WorkStations on Desk



Increasingly, lawyers practice law using a computer as a daily information tool. In 1992, 70% of the lawyers in the 500 largest law firms in the United States had a computer workstation on or near their desks. Six years before, in 1986, the percentage was 7%.¹ Our surveys are more journalistic than scientific. We do not offer the results as careful samples of the lawyers in the United States; they are not even scientific samples of the large firms. On the other hand, we have not consciously manipulated the results and the responses reflect a large and important group of lawyers. In 1992, more than two-thirds of these lawyers had a computer on their desks.

Most of the lawyers' computers were IBM or IBM compatible

1. RONALD W. STAUDT, CHICAGO-KENT COLLEGE OF LAW 1992 LARGE FIRM SURVEY AND STATISTICAL ANALYSIS § 1, at 3, § 2, at 73 (1993). The complete study and analysis is available through the Chicago-Kent College of Law Center for Law and Computers.

microcomputers with color screens, fast processors and lots of memory.² Most of the microcomputers were connected to local area networks that support firm-wide electronic mail,³ shared local data bases,⁴ and fast convenient access to computer assisted legal research.⁵ All the responding firms used computer assisted legal research; nearly every firm had both LEXIS/NEXIS and WESTLAW.⁶ Over 90% of the firms use computers to support litigation.⁷

At the entrance to the law profession, students begin law school in the 1990's already familiar with computers. In fact, it appears that most students own and use their own computer before they reach law school.⁸ Students in primary schools, high schools and colleges use computers to study and write. A wide variety of educational software has emerged in the last 10 years to support undergraduate instruction, stimulated and encouraged by the EDUCOM consortium of colleges and universities.⁹

The technology setting also includes four developments that may

2. *Id.* § 1, at 5-7, § 3, at 74-91.

3. *Id.* § 1, at 8, § 3, at 93-94.

4. *Id.* § 1, at 10, § 3, at 117-21.

5. *Id.* § 1, at 11, § 3, at 122-25.

6. *Id.* § 1, at 11, § 3, at 123.

7. *Id.* § 1, at 12, § 3, at 135.

8. In a 1991 survey, 59% of the students entering Chicago-Kent College of Law said they owned their own computers. In 1992, this percentage increased to 65% (survey instrument and results on file with the Chicago-Kent Center for Law and Computers). Our experience at Chicago-Kent is that many students purchase computers during the first year of law school. Virtually all Chicago-Kent students use computers during law school for a variety of applications from word processing and computer-assisted legal research, to taking examinations on computers.

9. "EDUCOM, founded in 1964, is a nonprofit consortium of higher education institutions which facilitates the introduction, use, access to, and management of information resources in teaching, learning, scholarship, and research." EDUCOM REVIEW, Sept.-Oct. 1992, at 8. For the most current compilation of effective uses of computing in postsecondary education, see EDUCOM REVIEW, 101 SUCCESS STORIES OF INFORMATION TECHNOLOGY IN HIGHER EDUCATION: THE JOE WYATT CHALLENGE (Judith V. Boettcher ed., forthcoming 1993). This is a collection of case studies authored by the college or university implementor responsible for each program. The collection is designed as a guide, reference and planning book for both higher education and secondary school educators and administrators. See also *Descriptions of 101 Successful Uses of Computer Technology in College Classrooms: EDUCOM responds to Vanderbilt Chancellor's Challenge*, CHRON. OF HIGHER EDUC., Oct. 16, 1991, at 26 (lists the 101 classroom applications of computer technology detailed in the EDUCOM compilation, with a short summary on each project); and COMPUTING ACROSS THE CURRICULUM: ACADEMIC PERSPECTIVES (William H. Graves ed., 1989) (for a description of various projects using computing in postsecondary education).

See generally IBM ACADEMIC INFORMATION SYSTEMS, TOOLS FOR LEARNING: COURSEWARE CATALOG (1990-91) (provides a listing of over 300 titles of IBM compatible software covering general business education, computer sciences, economics, engineering, humanities, life science, mathematics, natural science, physical science, and social science); CHARIOT SOFTWARE GROUP, MACINTOSH EDUCATIONAL SOFTWARE COLLECTION (Spring 1992) (provides a listing of over 150 titles focused on Macintosh software for teachers and administrators grades K-12); and CHARIOT SOFTWARE GROUP, HIGHER EDUCATION SOFTWARE COLLECTION (Spring-Summer 1992) (provides a listing of over 150 titles of both IBM and Macintosh compatible software for postsecondary educational use).

support the imminent emergence of the electronic casebook. The most important development is the radical change in the cost to law students of full text databases of law material. Two years ago it was difficult for law students, and for that matter law professors, to obtain access to WESTLAW or LEXIS. The points of access were guarded and rare. Most law schools had 3 or 4 simultaneous access points that were available most of the day, except during high demand hours when the services were blacked out to students and professors. In 1990, that restrictive and scarce resource became as free as flowing water. In the Fall of 1990, every law student in the country was offered a LEXIS/NEXIS password and a WESTLAW password. These electronic keys to the electronic libraries opened almost all the doors—24 hour a day access from home, office or school; downloading and off-line printing.¹⁰

Because of these initiatives by LEXIS and WESTLAW, law students who own computers and modems have enormous electronic libraries available to them at home for the cost of a local phone call. Those libraries are structured and equipped with powerful search and retrieval tools. Well-crafted word searches in WESTLAW, LEXIS and NEXIS will retrieve the full text of cases, statutes, secondary law sources and literature from a variety of other disciplines. If a student already knows the citation of a case or statute, it is more likely than not that the full text of that primary source can be on the screen of the student's computer within a minute or two. If the student can remember a few distinctive aspects of the case, like the name of one of the parties, the jurisdiction, date or any distinctive language, the case can be retrieved with similar speed, even if the citation is unknown. Citators and secondary materials are available on line. The library of recent academic literature published in the law journals is building within the full text databases. Rumors suggest that all law reviews will be on line soon.

We do not yet know how legal education will change as a result of this unlimited access to vast information resources.¹¹ The marked difference in the cost of the databases between law practice and law school already raises tensions between practitioners and educators about the fu-

10. In the fall of 1989, Chicago-Kent College of Law and Case Western Reserve Law School pretested wide personal access to LEXIS/NEXIS in joint studies with Mead Data Central. The Chicago-Kent Study extended for three years. Mead Data Central is preparing a preliminary joint study report on student and faculty reactions to this expanded access. The Center for Law and Computers at Chicago-Kent is working on a book-length evaluation of the changes that occur in student performance when unlimited LEXIS/NEXIS access is combined with a concerted faculty effort to incorporate use of the databases in course work. We hope to complete and publish the report in 1993.

11. For a superb analysis of changes in law itself that are linked to the use of electronic media, see M. ETHAN KATSH, *THE ELECTRONIC MEDIA AND THE TRANSFORMATION OF LAW* (1989).

ture of technology in law. Legal educators can see the databases as opened freely available hypertextual electronic images of the law.¹² On the other hand, practitioners are looking for research and communications systems that permit unlimited access without the huge costs of WESTLAW and LEXIS/NEXIS.¹³ This tension is a factor that educators must consider when weighing the wisdom of electronic casebooks that rely on LEXIS/NEXIS or WESTLAW as interactive sources of electronic text.

A second development that may prove to be a boost for electronic casebooks is the increasing compactness of the technology. The standard "floppy disk" is now a 3½" hard cased magnetic diskette that can hold 1,400,000 characters of information. Very compact CD-ROM (compact disk read only memory) drives can be attached to small computers and each removable 5¼" CD-ROM disk can hold 600,000,000 characters of text or equivalent amounts of pictures, music and even full motion video. The computers themselves are shrinking at a rapid pace. Tiny notebook computers pack desktop features into a case that is just about the size and weight of a typical law school casebook. These little computers can hold 120,000,000 characters of information on a hard disk, can read small disks that contain 1,400,000 characters each and can be connected to a telephone line or network for communication to WESTLAW or LEXIS/NEXIS. The best of these little notebooks have expensive but very readable active matrix color screens that are a pleasure to view.

A third technology development, accessible hypertext tools for microcomputers, makes it easier to build electronic casebooks with features that may make the electronic casebook a significant improvement over its printed counterpart. Hypertext is a term for a computer database of text that can be organized in complex and unpredictable ways.¹⁴ Using hypertext databases, a law professor can link different text segments and create imbedded cross references within text. For example,

12. One of my early ideas for an electronic casebook was simply a computer program that listed the LEXIS citations of the assigned material and handled the communications to the database for the students. LEXIS would serve as the source of all primary texts in such a casebook which I never built. One obvious problem with this approach to creating an electronic casebook is that each case must be included in its entirety. While I can make some arguments in favor of using the full case, especially after the first year of law school, I am unable to convince myself that the arguments should overcome the value of careful editing.

13. New electronic tools that use CD-ROM or network file servers are now emerging in specialized areas. See generally Barry D. Bayer & Benjamin H. Cohen, *Attorney's Briefcase: Legal Text in Hypertext*, THE RECORDER, Apr. 15, 1992, at 7. See also Simon Chester et al., *The Compact Disk Breakthrough?: Not Yet—But Soon*, LAW PRACTICE MANAGEMENT, May-June 1992, at 22 (for a review of law related products using CD-ROM technology which are now available from companies such as Mathew Bender & Co. and West Publishing Co.).

14. See David R. Johnson, *Building and Using Hypertext Systems*, LAW PRACTICE MANAGE-

electronic footnotes that link to the full text of the referenced works would be an application of hypertext databases in law. Because of its open ended flexibility, hypertext may be rich enough in its information representation to portray an accurate computer image of legal concepts, or at least a useful image of these concepts. Flexible hypertext systems permit the professor to suggest various organizations for material and then, in turn, allow the student to add to the material, reorder and link the material in new ways.¹⁵

Finally, the growing popularity of local area networks and wide area systems like Internet opens new channels for electronic communication and exchange of electronic texts. Many law schools have installed local area networks that connect faculty members to administrators and to student laboratories. These networks facilitate faculty-to-faculty exchange through electronic mail. Administrative matters are frequently handled by electronic mail and increasingly, faculty and students make educational contacts in the electronic medium. Internet is the educational and research network that links universities and research centers throughout the world. More than 1,000,000 host computers will be connected via Internet by the end of 1992.¹⁶

III. MINDSTORMS AND PEDOGAGY

At its inception, computer assisted instruction offered an eternally patient drill and practice tutor. Students could move through material at their own pace. The machine would be courteous and supportive, if programmed to react in such a way, no matter how often the student made mistakes.

As early as 1980 some visionaries saw that computers could be more than drill and practice machines. In a seminal work, Seymour Papert outlined his theory for the pervasive use of computers as "objects to think with" rather than drill machines.¹⁷ In describing the thinking be-

MENT, May-June 1991, at 28; and I. Trotter Hardy, *Project Clear's Paper Choice: A Hypertext System for Giving Advice About Legal Research*, 82 LAW LIBR. J. 209 (1990).

15. See Ronald W. Staudt, *Legal Mindstorms: Lawyers, Computers, and Powerful Ideas*, 31 JURIMETRICS J. 171, 184-85 (1991) [hereinafter *Legal Mindstorms*].

16. By 1995, more than one million computers will be hooked onto the network, predicted Vinton Cerf, VP, Corporation for National Research Initiatives. This includes an estimated 70 countries in the system with 10 million people exchanging information daily on national and international commercial networking services. Said Cerf: "Expect a complex transition from major government support to partial support, because it is not possible for the U.S. government to subsidize the network."

Lois F. Lunin, *IIA Speakers Focus on Network Opportunities and Obstacles: Information Industry Association 1992 Spring Conference*, INFORMATION TODAY, July 1992, at 26.

17. SEYMOUR PAPERT, *MINDSTORMS: CHILDREN, COMPUTERS AND POWERFUL IDEAS* 167-69, 208 (1980). See MARVIN L. MINSKY, *THE SOCIETY OF MIND* 72-74 (1986). See also CON-

hind the creation of the LOGO language, Papert explained that children equipped with freely available computers could learn on their own. Papert sought a technique to free mathematics instruction from the painful methods imposed on children in the past. He proposed LOGO as a way to create an environment in a computer where children could play with mathematical concepts, manipulate geometric shapes and learn by doing.¹⁸ His idea of MATHLAND stimulated me to attempt to seek the same advantages from computers for law students.¹⁹

Papert's idea that computers could create artificial worlds with special characteristics for learning is reflected in dozens of successful programs in a variety of disciplines. For example, SimCity allows city planners to design the characteristics of simulated cities and watch the program evolve the city over time as each new factor is selected.²⁰ Many award winning programs at a recent EDUCOM Educational Software Awards Presentation are simulations built on algorithms that put the student in a realistic computer created environment to learn physics, economics, biology, or neuroscience.²¹ These simulations are limited subsets of the reality that they portray, but they have proved to be effective tools to engage students.

At about the time that *Mindstorms* was published, Dr. Russell Bur-

STRUCTIONISM: THE MEDIA LABORATORY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, RESEARCH REPORTS AND ESSAYS, 1985-1990 BY THE EPISTEMOLOGY & LEARNING RESEARCH GROUP (Idit Harel & Seymour Papert eds., 1991).

18. PAPERT, *supra* note 17, at 1-13. Papert identifies a variety of problems with elementary education and proposes a rich array of solutions. For example, he proposes that young children can learn problem solving, planning, debugging, physics, and parts of the conceptual framework of calculus using LOGO.

19. See Staudt, *Legal Mindstorms*, *supra* note 15, at 177-85.

20. MAXIS SOFTWARE, MFG., SIMCITY (1989) (computer software product). See Gareth Branwyn et al., *Planning the Ideal City: SimCity Computer Game, City Planning Simulation*, FUTURIST, Jan.-Feb. 1990, at 43. See generally William F. Zachman, *Education: The Final Frontier—Computers and Education*, PC MAG., Aug. 1991, at 97.

21. EDUCOM and University of Maryland Announce Winners of 1992 Software Awards, Press Release (University of Maryland at College Park, Computer Science Center), Aug. 6, 1992 available in LEXIS, Nexis Library. The EDUCOM Higher Education Software Awards program was established in 1987 to reward innovation in development of educational software and computer-based teaching methods for higher education. The sixth annual (1992) awards were presented in August, at Snowmass, Colorado. The Best Design Award and the Best Natural Sciences Software Award (Physics) was presented to *RelLab* (Bolt Beranek & Newman, Inc.). The *RelLab* entry provides an open-ended environment to simulate personalized experiments in both Galilean and Einsteinian Relativity. The Best Instructional Innovation Award and Best Social Science Software Award (Economics), was won by another microworld simulation, *Smithtown* (University of Pittsburgh). *Smithtown* simulates microeconomic principles in a small town environment. Other examples of simulated, computer-created environments are: *BioQUEST: Quality Undergraduate Educational Simulations and Tools in Biology* (Beloit College, University of Arizona, From the Heart Software, and the University of Wisconsin-Madison) winner of the Distinguished Natural Sciences Curriculum Innovation Award (Biology), and *MacRetina: A Simulated Experiment in Neuroscience* (Smith College) winner of the Distinguished Natural Sciences Software Award (Biology).

ris was organizing a Center at the University of Minnesota Law School to build computer assisted instruction in law. Because of his Center for Computer Assisted Legal Instruction (CALI), legal education may be the most organized graduate discipline for the preparation and dissemination of computer assisted instruction. More than 130 U.S. law schools and 28 foreign affiliates are members of the CALI consortium. Pioneering law professors, working with CALI, have developed computer instruction in a variety of substantive and skill areas.²²

While early computer assisted instruction (CAI) in law was completely text based and resembled an objective test, each lesson was also a simulation of sorts. Early law CAI was designed to duplicate the socratic classroom. Russell Burris, Roger Park and Robert Keeton worked in the first years of CALI to build question and answer interplay within a computer that had complexity and richness. Their aim was a simulation of a law school class in which each student would answer every provocative question posed by a superb socratic professor.²³

My approach to the use of computers in law school has focused on productivity. I have been using computers to help students improve their study techniques. I am especially interested in the ability of computers to help students synthesize legal materials, see connections between cases and concepts, and understand legal analysis. In the mid-1980s several productivity and educational tools became available on one machine: word processing, outlining, computer assisted legal research and computer assisted instruction. Before the emergence of the microcomputer, each of these electronic tools required its own separate computer and separate screen. My objective was to help integrate these various tools to equip each student with a powerful array of electronic learning systems

22. See CALI, THE CALI CATALOG 1992-93 COMPUTER-BASED EXERCISES (1992). CALI features a generous selection of lessons in substantive law subjects including:

Accounting	Insurance Law
Arbitration	Labor Law
Civil Procedure	Legal Research and Writing
Commercial Transactions	Professional Responsibility
Contracts	Property Law
Corporate Law	Securities Regulation
Criminal Law	Torts
Employment Discrimination	Trial Advocacy
Evidence	Wills and Trusts
Federal Courts	

23. RUSSEL BURRIS ET AL., TEACHING LAW WITH COMPUTERS: A COLLECTION OF ESSAYS (1979). See also Margaret M. Hagen & Thomas L. Hagen, *Simulation of Legal Analysis and Instruction on the Computer*, 59 IND. L.J. 195 (1984). For an early discussion of advantages and disadvantages of computer-assisted instruction in legal education, see Robert C. Clark, *The Rationale for Computer-Aided Instruction*, 33 J. LEGAL EDUC. 459 (1983); Gary C. Korn, *Computer-Assisted Legal Instruction: Some Reservations*, 33 J. LEGAL EDUC. 473 (1983); and Robert C. Clark, *A Postscript on Gary Korn's Reservations about CAI*, 33 J. LEGAL EDUC. 489 (1983).

to mimic in law what Papert envisioned for mathematics instruction.²⁴

I became convinced that outlining software could improve the ability of students to understand the connections between various legal concepts. By describing cases and categorizing them in richly labeled outlines, students can attempt a snapshot synthesis of a concept area. Adding new cases to the structure forces students to revise their categories and reorder the relationships to accommodate new fact patterns and new decisions just like the legal system that they are studying.²⁵

Students have accepted this approach with varying enthusiasm over the years. Depending on the intensity of our instruction, a small to modest percentage of students used this method extensively. The majority of students did not. In part, I attribute the lukewarm interest in this study technique to the fact that the dominant word processor in law practice and law schools does not have inherent outlining capability. In earlier years we taught and furnished to students a software set that included a less powerful word processor that was tightly integrated with outlining tools. Today, if students wish to make use of good outlining software that supports dynamic expansion, collapse and reordering of titles and accompanying text, they must learn and use software that is not completely compatible with the word processor that is their thought capture tool. This barrier deters most students. Outlining becomes for them an isolated activity performed at the end of the semester rather than a natural part of the day-to-day study routine.

Another problem with the use of outlining software that may deter student use is its rigid structure. Information must be represented in a hierarchy like the grade school outlines used by earlier generations. Law concepts are messier than the elegant, organized, hierarchical outline. The seamless web is a busy and disorganized set of interconnected concepts and cross references. This insight suggests that outlining software may be helpful for first year classes or as study aids to pass examinations but that outlines alone are not rich enough to express the relationships between texts in most legal domains.

Finally, the outlining study technique requires students to type class notes, case briefs and their notes on outside reading into the computer to take advantage of its synthesis tools. With the advent of freely available

24. Staudt, *Legal Mindstorms*, *supra* note 15.

25. For a more extensive description of my early experiments and my attempts to integrate the use of outlining software with computer-assisted instruction, see Ronald W. Staudt, *Computers at the Core of Legal Education: Experiments at IIT Chicago-Kent College of Law*, 35 J. L. EDUC. 514 (1985); and David J. Maume, Jr., & Ronald W. Staudt, *Computer Use and Success in the First Year of Law School*, 37 J. L. EDUC. 388 (1987).

LEXIS and WESTLAW, it is painless to download and copy excerpts of outside reading into the computer. But class notes and the casebook contain the core materials that students study for their classes and the final examination. Handwritten notes and the printed casebook pose time-consuming data entry tasks, raising another barrier to the use of the computer to synthesize and coordinate the study process.

IV. AN ELECTRONIC COMPANION TO A PRINTED CASEBOOK

In my first attempt to build a computer tool for law students, I designed an electronic companion to a major Copyright casebook. My target was a modest hypertext tool that contained the structure of the casebook, but not the cases themselves, enhanced with tools to improve the user's ability to view the materials in different ways. I also wanted the user to be interactive with the material and to be able to add the user's ideas and comments about the law covered in the book. Finally, I planned to open a direct link from the new tool to LEXIS/NEXIS using communications software. In this way I planned to give the student or professor the ability to bring the course material up to date, to check on the validity of the selected cases, to read the text edited out of the cases in the book and to investigate areas of interest more deeply than is possible in a printed casebook or a printed teacher's manual.

With the permission of Professors Jane Ginsburg and Robert Gorman, the authors of *Latman, Gorman & Ginsburg, Copyright for the Nineties* (The Michie Company, 1989),²⁶ we built a teacher's companion to their book using HyperPAD. To supplement the information content we added my teaching notes and the teaching notes of Professor Gorman. Instead of the text of the cases, these teaching notes are the content of HyperPAD pages.²⁷ Edited cases were available in the printed book. The full text of cases was made available by the proposed link to LEXIS.

We worked for many months with many different pad designs and backgrounds. We experimented with color coding to identify different types of destinations for buttons, such as red for statutes, blue for cases, and other colors for legislative materials and other sources. We tried a

26. ALAN LATMAN ET AL., *COPYRIGHT FOR THE NINETIES: CASES AND MATERIALS* (1989).

27. BRIGHTBILL-ROBERTS & CO., LTD., *HYPERPAD 2.0* (1990) (computer software product). HyperPAD is an object-oriented development tool. It is a character-based software package that can be run on any IBM Personal Computer or compatible equipment. It was designed to provide the capability to develop prototype software, set up databases and develop computer training applications. See LISA KRYGER, BRIGHTBILL-ROBERTS & CO., LTD., ET AL., *HYPERPAD 2.0, USER'S GUIDE* (1990). See also MARK W. CRANE & JOSEPH R. PIERCE, *HYPERPAD COMPANION* (1989).

map-like table of contents that would allow quick access to many sections, but it was too alien in appearance and confusing. After many false starts we decided to use a simple table of contents paradigm that is familiar to most people and instantly recognizable.

We started with a top level page, appropriately named "TOP," that listed the major sections of the work—the chapter titles. Each of these chapter titles has a button next to it that takes the user down one level in the hierarchy to a page with the chapter's subsection listing. Buttons on the subsection page take the user down another level, and so on to the end "nodes."

The nature of the end nodes determines the nature of the work. Where the end nodes contain notes of the student or teacher, the pad can be a student's outline or a teacher's aid. This is the proposed use for the first application described here. When source text resides in the major field of the end nodes, the hypertext work is the equivalent of a book.²⁸

Navigation buttons carry users up, down, back and forth through the hierarchical table of contents. We experimented with a series of tools in this area and found that vertical and horizontal scrolling required different visual presentation. Vertical movement in the structure could snap quickly into view. Horizontal scrolling seemed more intuitive if the replacement page pushed from the right or left as appropriate to the context.

We put a LEXIS button on every page so that the HyperPAD tool could serve as a link between the casebook and LEXIS/NEXIS. During our work with HyperPAD the LEXIS button evolved considerably. In its first form, it would launch a communications program and initiate the link with LEXIS. The teacher or student had to do the rest.

Now we have completed a preliminary version of a LEXIS button that allows the user to jump to a specific function in LEXIS/NEXIS. On a case page the button contains the citation of the case so that the user can select LEXSEE, Shepards or AutoCite. The button also can store full search requests. The HyperPAD user can push the LEXIS button to update the law described at any level of the outline.

Student and teacher reaction to this note-taking casebook companion was cool. For example, when I offered a version of the teacher's manual to my class in Copyright Law in the Spring of 1992, less than half of the class used the tool. Let me note that I had removed my teaching notes and those of Professor Gorman before I gave the tool to my

28. The second application, described next, presents an illustration of a hypertext casebook in computer law.

students. I am sure that the reaction would have been different if I had left those notes in the casebook companion. In the form offered to the students, the tool contained the text of the Copyright Act of 1976 and some related statutory material together with the structure of the book in a nested set of pages ending in case pages that were designed to permit note-taking by the students. Of those who tried to use the casebook companion, the reactions were mixed. Some thought it was useful because of the link to LEXIS. Others found it inconvenient to type in their notes from class. Others were put off by the bugs that we found after the initial distribution. Others praised the organizational aspects of the system and its ability to capture cases from LEXIS and link them to the course outline.

There are significant social and infrastructure barriers to this new presentation of legal teaching materials. While most of the students had computers at home, only a very few had mice. A mouse is not essential, but it makes hypertext more intuitive, faster and more powerful. As a result, we are paying special attention to keyboard techniques like accelerator keys to improve the utility of the electronic books for those without a mouse.

The data entry problems that posed barriers to the frequent use of outlining software were only partially addressed in the student version of this tool. Students could bring small computers to class and take notes in the casebook companion. We provided some useful features to help select and copy excerpts from the Copyright Act to the students' note pad. The most popular features were the reference materials in the companion—the definitions and electronic presentation of the statute. But the casebook itself and all the assigned cases were still in print, except for the handful of very recent cases that the students were told to download and read. The hypertext book described next was designed to overcome these “final” barriers.

V. THE FIRST FULLY ELECTRONIC CASEBOOK: COMPUTER LAW ON DISK

The central tool for delivery of the materials of legal education to students is the casebook. Casebooks contain three types of intellectual creativity: (1) a list of cases and readings selected and sequenced by the author; (2) elisions from the selected readings that do not serve the pedagogical purpose of the book; and, (3) instructional material written by the author that contains explanation, background information, questions, cross references and problems relating to the selected readings. Paper

casebooks have a table of contents that outlines the material covered and a table of cases listing the cases excerpted in the book with their citations. Indexes of key terms are offered at the end of casebooks. The text in a paper casebook does not fill every inch of the page so that the student can take notes in the margins and draw arrows to cross references on the same page or the opposing page. To emphasize the importance of parts of the text, students frequently color over passages of the printed page with highlighters. Creative approaches to this colorization technique call on a variety of colors to emphasize different categories of information. Students often write in the margin, page through it in class and read it in the bathroom or on the train. These features of print challenge the designer of an electronic substitute.

My first attempt to build a computer substitute for the printed casebook is a HyperPAD casebook for my Computer Law course. The course is an investigation of the adequacy of five substantive law systems to handle disputes and problems arising out of the use of computers. For example, we read cases about the use of theft statutes to punish theft of computer time when many theft laws require asportation of the object stolen. The areas in the casebook include torts, criminal law, evidence, civil procedure and privacy. Contracts, international law and intellectual property are omitted because the impact of computers on those areas of law is covered in other courses in the law school curriculum.

For two years I prepared cases and materials on paper and distributed photocopied versions of the "book." In the fall, 1992, I distributed the entire book to the students on the hard disks of notebook computers that the law school loaned to the students for the semester. The computers are the size of a ream of paper and weigh about six pounds. They have serial ports and modems for telephone connection to the law school network from home, as well as pocket network connectors to attach to the network in the classroom or library. They operate on batteries that are rated at approximately 4 hours of continuous use.

The structure and sequence of cases presented in the book are contained in a hierarchy of screens that serves as the table of contents. The top screen has buttons for each chapter. If a chapter button is clicked, a screen listing the subsections of that chapter is displayed. At the bottom of the hierarchal structure, the "nodes" contain the full text of the assigned cases, rather than the notes of the teacher. The parts of the case that are not important for the analysis in the course are presented in reverse video so that students have access to the full text but can quickly skip over the less important material.

Students can read assigned material on the computer, annotating and highlighting the text as they wish. The electronic book allows students to type free form notes at any level of the book hierarchy: case, section, chapter or book. These note pads are pages in the book that pop open when an electronic button is clicked at the bottom of every screen. They serve as a substitute for the note book and the margin of the printed book.²⁹ Sections of text can be blocked and copied from the cases themselves to the note pads. Text files downloaded from LEXIS can be inserted into the note pads to augment the assigned cases.

Students can shade or color any text using painting tools that resemble a highlighter if the student uses a mouse to select the text to paint. Synthesis tools are available to pull together an outline that imbeds the notes added by students within a framework structured like the table of contents. This outline of student notes and case excerpts can be printed or manipulated in an external word processor.

By adding "buttons" to any page, the student can link that page to any other page or to a variety of functions. To navigate through the casebook or through the pages of a case, students can use search tools that find each occurrence of selected words. Buttons on every page jump the student to a table of cases or various levels of the hierarchy or previous sections or succeeding sections.

The Computer Law book also contains some tools to help students write their own electronic projects that can supplement the material in the book. Each student in the fall 1992 class was assigned a case note or other research project. The project was to be prepared as an electronic booklet that linked to the course materials. In this way every student had access on their individual machine to the project results of every other student. These electronic booklets were distributed over the law school network before and during the class sessions.

Classes were held in a classroom in which each student had access to network connectors and electricity. At the beginning of class students logged into the network, started the HyperPAD software and called up the electronic Computer Law casebook. The network electronic mail system can pop up on top of the casebook and recede into the background with the touch of a key.

29. Professor William Andersen suggests that there are visual cues in handwritten notes that are meaningful and accessible during a presentation. Printed notes on the screen or on paper have a blandness or visual sameness that may undermine their value for some purposes. I find this insight particularly apt for teaching notes. I find myself making a handwritten list of key points drawn from a computerized outline of extensive class preparation notes. These visual cues may not be so important for study notes that are aimed at exam preparation.

The plan for the course was to explore law school teaching in this rich technology setting. I hoped to stimulate more participation in the course through the projects that each student contributed to the teaching materials. One of the most frustrating problems in law school teaching is the temporal dissonance caused by the fact that only one performance, the final examination, is graded. Students are intensely interested in the material covered in the second week of the course only in the week following the last class as they prepare for the examination. I hoped that graded projects would stimulate some students to be excited about the material at the same time as I am eager to teach.

Access barriers to use of these electronic law materials have been reduced by providing the software and the hardware and a capability for remote connection to electronic mail from home. Training still poses an access barrier. After all, every graduate student knows how to read a book. While most of the students who selected this course are advanced computer users, some were familiar only with word processing.

Early reactions suggest that even the less sophisticated students coped with the learning necessary to use the book. Classes were lively and students were well prepared and able to discuss the cases from the computer screens. Several students raised concerns about their ability to take good notes on a computer while keeping their attention on the class discussion. Others were unable, without extensive assistance, to master the software that builds electronic books from their research notes for the assigned projects.

People prefer to read paper rather than computer screens. I must admit that I share this media preference. I usually proofread my writing by printing a copy and marking the corrections on paper. Additional proof of this preference comes from the use patterns of students who have unlimited access to LEXIS/NEXIS and WESTLAW. For example, during the 1991-92 academic year, the law students at Chicago-Kent College of Law downloaded and printed 88,000,000 lines of material from WESTLAW. Each line contained information that they had located on the WESTLAW database that is available to them at no cost 24 hours a day. Each line was downloaded to a disk file on their machines where they could keep the information and read it at their whim. Each line was then printed.

One way to approach this problem is to prepare electronic texts that can be read in print or on the computer screen. Professor Peter Martin at Cornell Law School is using this method to supplement his teaching materials. While he builds electronic materials for his classes, he distrib-

utes the same material as paper handouts. The paper foothold is required today, even if a purely computer tool would be superior, because all students do not have the necessary equipment to read computer based material.

Yet, I think that it is inevitable that the central feature of today's law education, the casebook, will become completely electronic.³⁰ The electronic casebook project described here is designed to explore that future when every student has a small and powerful computer.³¹ I am willing to declare the experiment a success. At least it has not failed at the inception. I found the class a thrill to teach. The students were active even eager in their pursuit of the material. Perhaps it was the Hawthorne effect³² but this course felt more energetic than classes that I have taught in prior years.

Students used the computer book as the source of course material to the exclusion of paper. There may have been bootleg paper versions of the materials but no one brought printed versions of the materials to class. Note-taking in class was also done almost exclusively on the computers. The first two student hypertext projects were immediately useful as informative extensions of the materials that I prepared for the course. Both were implemented in the hypertext tools furnished with the com-

30. Before the paper lovers tune out, let me suggest that there will be lots of paper in use when this electronic casebook becomes prevalent. Paper may become a convenient interface to the electronic casebook, just like paper is now a convenient interface to electronic opinions of the Supreme Court, to the electronic originals of deposition transcripts, to electronic land records in some counties, to electronic contracts consummated using EDI, to electronic reports filed with the Security and Exchange Commission, and to electronic tax returns. Lest you miss this heavy-handed point, electronic information is fast becoming the original and the paper versions of the electronic data are merely interfaces to the "best evidence." This "paper as interface" phenomenon does not reduce the amount of paper used in the information process, it increases paper consumption. We take less care of paper because we can always recreate it from the electronic "original." We make multiple copies because we have fast printers.

This insight was triggered by an article written by Professor Peter Seipel of Stockholm University in Sweden. Seipel's article, "Paper Laws in Transition," suggests that paper is now an "interface."

. . . [P]aper is being used as a transitory medium, a convenient way of checking the contents of a file or record, of proof-reading, of creating a personal memory slip, and so forth. . . . [P]aper as "storage" is giving way to paper as "interface." Documents are printed on demand and discarded once they have been used.

FROM DATA PROTECTION TO KNOWLEDGE MACHINES: THE STUDY OF LAW AND INFORMATICS 99 (Peter Seipel ed., 1990).

31. Care must be exercised to avoid putting less affluent students at a competitive disadvantage. Scholarships should include funds to help students purchase computers or computers that meet the educational needs of the student body should be furnished with the cost of tuition.

32. F.J. ROETHLISBERGER & WILLIAM J. DICKSON, *MANAGEMENT AND THE WORKER: AN ACCOUNT OF A RESEARCH PROGRAM CONDUCTED BY THE WESTERN ELECTRIC COMPANY, HAWTHORNE WORKS, CHICAGO 14-19* (1964). See generally Jay W. Lorsch, *Making Behavioral Science More Useful*, HARV. BUS. REV., Mar.-Apr. 1979, at 171 (discussing the proposition that any change in work environment will yield short term positive results).

puters. I reviewed each project and distributed both to the rest of the class on electronic mail. One project was valuable during class when it became clear that a case summarized in the student project was the best example of a comparison between computer software and books for the purpose of strict product liability.

The electronic medium allowed greater spontaneity in the course materials. I could assign new material on a moment's notice and electronically mail the new materials to everyone. I even distributed short additions by electronic mail during class. Students received these materials and added them to the structure of the book itself.

The student projects were intended to flesh out the background of important cases and push the students to examine the consequences of the court decisions on the professional lives of lawyers and the economic decisions of the industry involved in the dispute. I learned new things from these projects and shared that new information with everyone in the class in a convenient and flexible way. The tight link between the structured material that I prepared in advance and the open-ended electronic mail connections between and among everyone in the class produced additional learning opportunities.

VI. CONCLUSION

For the first time in my investigation of the use of computers to enhance legal education, I am beginning to see the emergence of an electronic teaching and learning environment that may meet, for law students, the challenge of Seymour Papert's MATHLAND. For the first time, all the information related to a course was stored in electronic form from the beginning, including the casebook, students' highlighting and marginalia, class notes, student projects and outside reading, supplementary cases and texts from LEXIS/NEXIS and WESTLAW. Electronic mail offered the equivalents of hallway discussions and office conferences with students and study group interactions.

The preliminary success is that students with a range of computer competence worked effectively in this new environment. It appears that the synthesis tools and outline generators and hypertext capabilities of the system were effective. My longer goal is to determine if the hypertext system can be an effective academic tool that also proves to be useful later, when students as lawyers encounter client problems in these substantive areas.³³

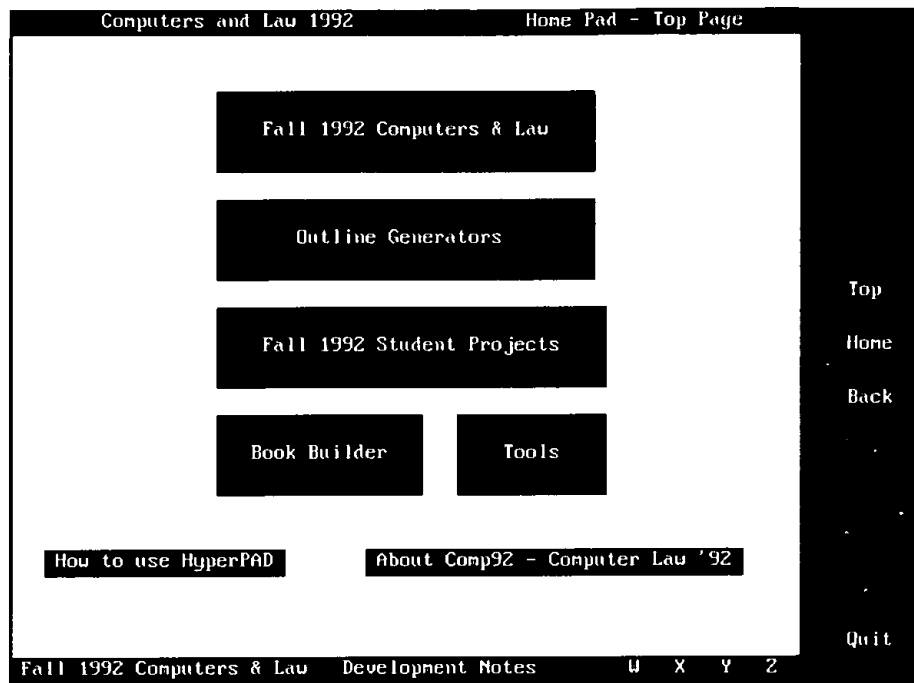
33. For an incisive description of the use of hypertext to support law practice, see David R.

In May 1992, Harold Evans, president of Random House, and John Scully, chairman of Apple Computer Company, announced that the Modern Library book series will be published in electronic form.³⁴ These two giant companies are betting that readers will be enticed by the special features of personal computers to read great literature on screens rather than on paper. Until my recent experience with the electronic Computer Law casebook, I would have expected Apple and Random House to lose their bet. Now I am not so sure.

Johnson, *A New Era: All Your Expertise in a Database*, COMPUTER COUNS., July 1992, at 1. See also Johnson, *supra* note 14.

34. Philip Elmer-Dewitt, *Read a Good PowerBook Lately?*, TIME, May 18, 1992, at 69. See also Evan I. Schwartz, *Scrolled Any Good Books Lately?*, BUS. WK., Sept. 7, 1992, at 61. For a speculation on the ascendance of electronic books and databases and the decline of printed books and libraries, see Lauren H. Seiler, *The Concept of Book in the Age of the Digital Electronic Medium*, LIBR. SOFTWARE REV., Jan. 1992, at 19.

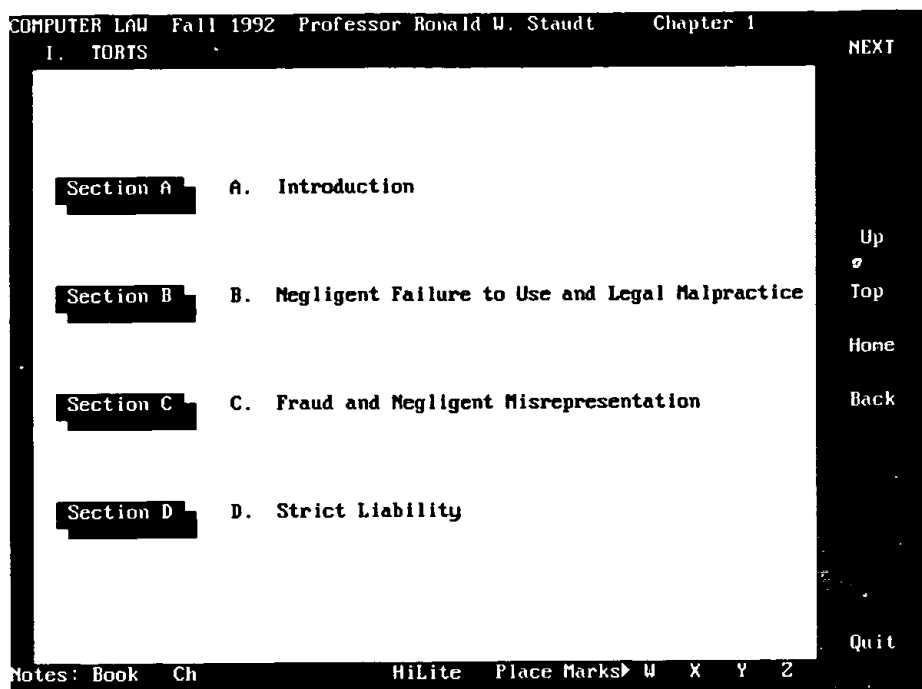
APPENDIX



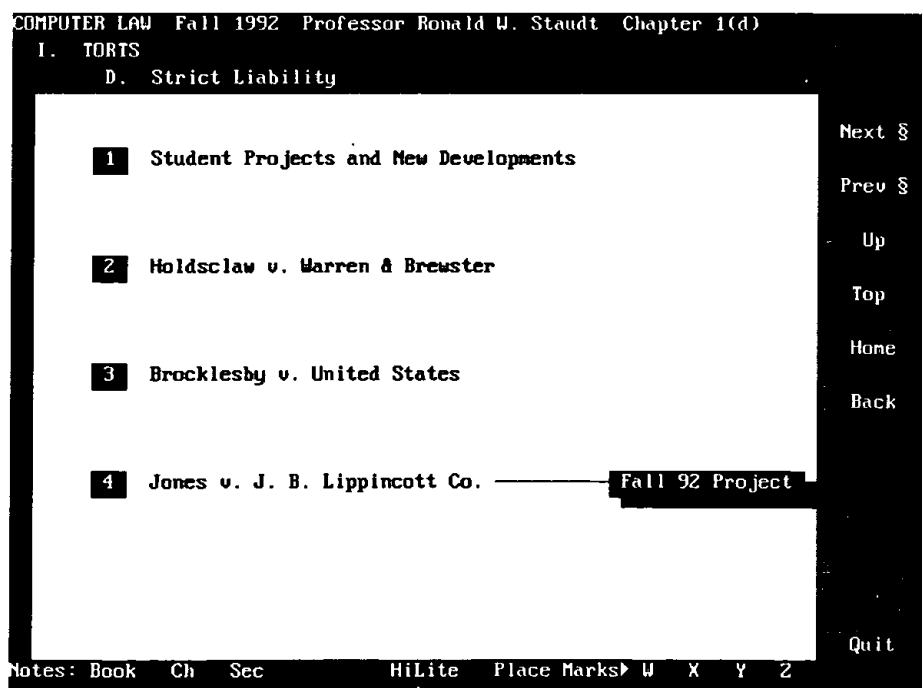
At the top of the book, this screen identifies the preliminary options available to the student. By clicking on the large rectangle titled, "Fall 1992 Computers & Law," the user moves to the next screen containing the chapters of the book. The other dark rectangles take the user to tools or instructions.



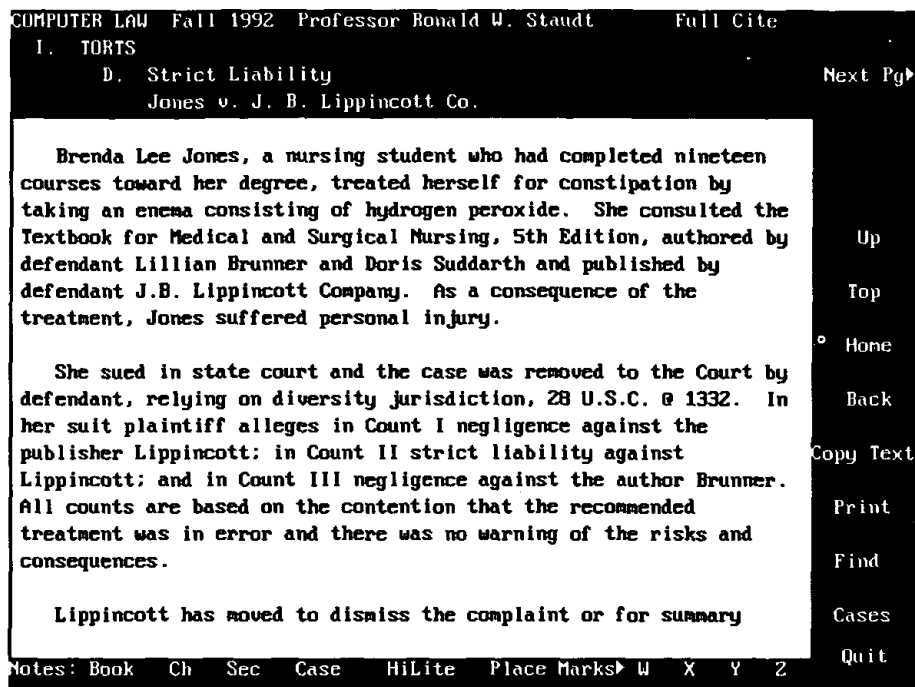
This is the first screen in the book itself. It contains six buttons that will take the user to the contents of each of the six chapters in the book. At the bottom left corner is a button called "Book" that jumps to a note pad. The "Book" note pad can be used as a chronological set of student notes or additions that are aimed at the highest level of generality—they relate to the book as a whole.



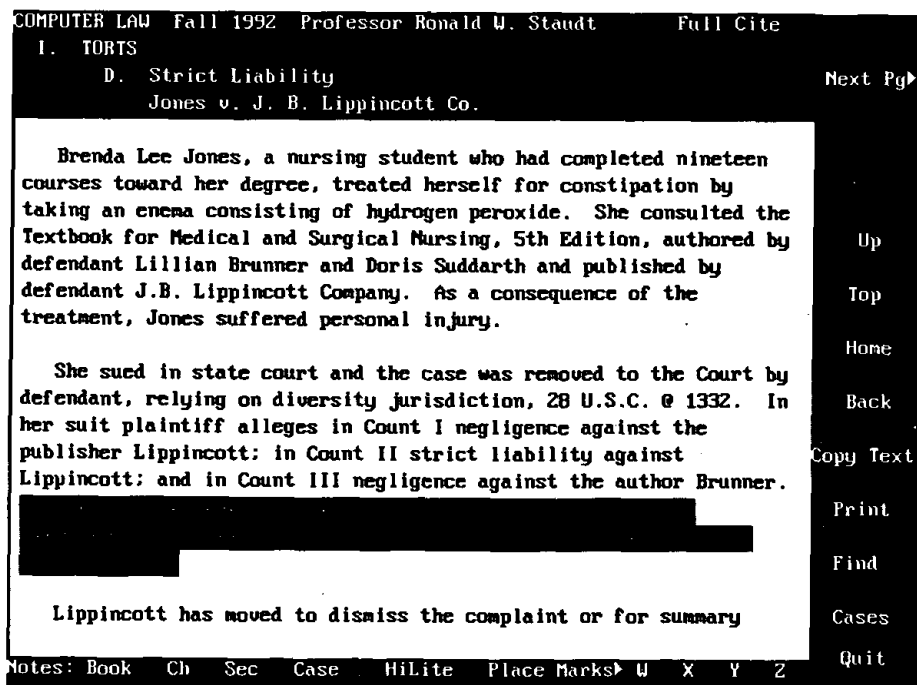
This screen is the listing of the contents of Chapter I, Torts. Notes buttons on the bottom row point to both the Book notes and to a separate note pad for this chapter, called "Chap." In the top right corner of the screen is the NEXT button that rotates to the next chapter.



The contents of Section D of Chapter I are listed on this screen. The numbered square buttons to the left of each item in the list will jump to the full text of that case or reading. At the bottom of the screen a "Sec" button appears to offer students an area to take notes about the section. To the right of item 4 is a rectangular button titled "Fall 92 Project." This button links to the student analysis of this case.



This is the first page of the "Jones" case. The screen contains a button for a new note pad called "Case" located on the bottom row. The top of the screen shows the position of the case within the outline of the book.



At the bottom of the screen in the center is a button titled "HiLite." Using the mouse students can color the text or shade it. In this example, the last sentence in the second paragraph of page 1 of the "Jones" opinion has been highlighted.

COMPUTER LAW Fall 1992 Professor Ronald W. Staudt

IV. TORTS

D. Strict Liability

Jones v. J. B. Lippincott Co.

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◀Prev Pg

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Find

Cases

Quit

Judgment on the grounds that it has no duty to plaintiff with respect to the content of publications.

Author liability for errors in the content of books, designs, or drawings is not firmly defined and will depend on the nature of the publication, on the intended audience, on causation in fact, and on the foreseeability of damage. See, e.g. Demuth Development Corp. v. Merek & Co., Inc., 432 F. Supp. 990 (E.D.N.Y. 1977). Publisher liability, on the other hand, has more clearly defined principles and is therefore more easily determined. If a publisher serves the function of publishing the contents of an author, other than one of its own employees for whom it would be liable under the doctrine of respondeat superior, it has no duty for the contents. See Lewin v. McCreight, 655 F. Supp. 282 (E.D. Mich. 1987); Demuth Development Corp., supra; Alm v. Van Nostrand Reinhold Co., 480 N.E. 2d 1263 (Ill. App. Ct. 1985).

In this case, the plaintiff urges that Lippincott became author or co-author by its activities in the publication of Brunner's book and therefore Lippincott has author liability.

Notes: Book Ch Sec Case HiLite Place Marks▶ W X Y Z

This is the second page of the "Jones" case. As the "Next Pg>" button or key is pressed, the text is replaced horizontally to give the impression of a turning page.

Jones v. J. B. Lippincott Co. Table of Contents 1/1

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Chapter 1 The Problem of Software Products Liability

Chapter 2 Theories of Tort Liability

Chapter 3 Vendor Response

Chapter 4 Conclusion

Chapter 5 Bibliography

One of the student projects by Joleen Willis investigated the analogy between books and software for the purpose of finding strict liability for injury caused by defective computer programs. This is the top page of the project. Clicking on the "Fall 92 Project" button shown in Picture 4 displays this page.

Jones v. J. B. Lippincott Co.		Section 1/1
Chapter 2	Theories of Tort Liability	Howe
Section B	Products Liability	Top
Section 1	Strict Products Liability	Up
Section a	General Trends	Back
Section b	Analogy to Information: Books and Charts	Prev
Section c	Software Cases	
Section d	Software Exceptions	

This screen shows some of the deeper structure of the Willis project nested four levels down. If one of the topics on this screen is selected, the user sees a series of text screens written by the student to explain the law in this area.

