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**COMPUTER LITERACY AND COMPUTER APPLICATIONS
IN ENGLISH STUDIES**

by

JOHN KEITH GILBERT

B.A. (Honours) (English). Simon Fraser University, 1987

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
MASTER OF ARTS
in the Department
of
English**

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Abstract

This thesis discusses computer literacy as it applies specifically to the field of English studies and presents a plan for a computer-based "English Scholar's Workstation". It is concluded that computer literacy is becoming one of the skills necessary for competence in the field of English studies. Computer literacy is discussed in relation to print literacy and using literacy theory as it has been applied to print and computer literacies. Computer-based technologies and their current and potential applications in the field of English studies are discussed in relation to the English Scholar's Workstation. The following computer based technologies are discussed: hypermedia, electronic communications and file transfer, computer-assisted text analysis, computer-assisted composition instruction, electronic data management and storage, presentation and desk-top publishing, and scanning and optical character recognition. The English Scholar's Workstation is a hypermedia-based software centre running on a computer or network of computers and linking various computer hardware, software resources, and data resources.

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Preface

Since roughly my last year as an undergraduate, I have experienced an acute problem with the organizational structure of my essays. Although I have always found an adequate line on which to arrange those little groups of marks on paper, writing the essay has been fraught with indecisions and rejections of connections, asides, and explanations I would have liked to have made. My rejoicing at the closure of an essay has usually been tempered by serious doubts as to whether or not I said anything near what I really wanted to say. Lately these feelings have coalesced into a dissatisfaction with the limitations imposed by traditional modes of written exposition. In oral exposition these limitations reflect the limits of human memory; in writing they are further complicated by the limits of a two-dimensional writing surface and the time it takes to acquire further two-dimensional-surface-based documents and move from one to another. Certainly writing has in some senses augmented human memory, but the dimensional and chronological barriers imposed by it remain limits.

Hypertext and hypermedia, made practical by contemporary computer technologies, have moved those limits much farther away. An author can now create alternate structurings of a single document, and provide therein explanations, asides, and connections that a reader could choose to view or not. Yet for this thesis I am still required to present my ideas on paper. It is somewhat frustrating to be writing about this technology and not be able to demonstrate its use, and there are several places in the text where it would have been very useful to put hypertextual links to explanations, examples, and sources.

If I had been allowed to present this paper as a hypermedia document

rather than a paper document, I would have presented some of the documents I have made reference to and selected from in their entirety and embedded buttons to take the reader to the relevant sections. Wherever convenient I have incorporated blocks of material from secondary sources rather than paraphrasing or describing these sources. Paraphrase or description, where it is not used to save volume over or intentionally distort the original, results from the unavailability to the reader of the original material; it is largely a matter of convenience. Given the ease of reproduction of electronically transmittable material, it is often easier and more precise to display the original or selections from it than it is to paraphrase or describe. Displaying the original also reduces the inevitable distortion resulting from hermeneutic manipulations of the text, since it is neither necessary for the writer to interpret the text for the reader or to prove that he/she understands the text.

Chapter I. Introduction

The concerns of this thesis fall into two main categories: the use of computerised information technology to facilitate all phases of English scholarship on a practical level, and the more theoretical aspect of how extensive use of that technology might affect interactions among English scholars and between English departments and the communities they serve. This second of these categories is of interest largely because of its ideological or political dimension.

In her "Presidential Address 1990: On Differences", Catherine R. Stimpson, the current president of the MLA, sees computer use along with multiculturalism as promising "to invigorate literacy and our belief in the word" (406). Unfortunately, an MLA presidential address is not the place to go into a lot of detail, and Stimpson does not expatiate on her claims for the computer's role. Nonetheless, her statement does give a certain legitimacy to the use of the computer in English Studies, letting us know that it has "arrived".

There are two broad approaches to the relationship between computers and literacy. One deals with the effect that widespread computer use might have on *print* literacy. The other aspect deals with *computer* literacy; that is skill in using computers themselves and understanding of and ability to articulate the uses of computers and their implications. Despite the increasingly common use and extensions of Graphical User Interfaces (GUI),¹ print literacy is still a prerequisite of doing any extensive or

¹ Graphical User Interfaces use various combinations of icons, menus and pointer-controlling devices such as mice or trackballs, to command or control the computer, as opposed
footnote continued >

productive work with computers.

The analogies between print literacy and computer literacy go deeper than a superficial metaphorical connection. The notion of “functional literacy” applies to both. Deborah Keller-Cohen refers to functional literacy as the possession of the literacy skills necessary to function in a modern society (7). In her examination of literate practices among credit union members and employees, she concludes that many people read only as much as they think necessary to accomplish a specific task or function in a particular job role (20). Using this model we could view functional computer literacy as the possession of only sufficient skill in using and understanding computers to accomplish specific tasks or groups of tasks. For example, one might only be able to do basic word processing and file management with a rote memorization of the procedures necessary. Shirley Brice Heath, in her examination and comparison of the literate practices of three related communities, finds that the more instrumental and context-bound the use of reading and writing, the greater are the limits on the users’ ability to succeed academically and to move up the social scale (343-369).

Where individuals are only functionally literate—using only enough reading and writing as is necessary to accomplish certain tasks—they are less likely to be able to apply literate practices to new tasks and to learn new literate practices for new situations. So we might see an English scholar who is only functionally computer literate doing little more than word-processing papers, not transmitting written text electronically or managing the large amounts of data that are commonly being manipulated

to the primary use of command keystrokes, command lines, and embedded commands.

electronically in other disciplines. While this scholar may be expanding the knowledge or boundaries of her discipline in traditional ways, she may not be doing it with the speed she otherwise could using the abilities of electronic information management; she may not be disseminating her insights and discoveries as widely, effectively, or efficiently as possible and thus may be limiting the dialogue that would involve her work; she may not be contributing to the evolution of the techniques of her discipline; and she may be limiting the effective relevance that her work might have for her social environment.

In his introduction to *The Social History of Language*, Peter Burke discusses the use of language and literacy as an indicator of community membership (3ff). If we view technologies as analogous to languages, we can see that the use, refusal to use, or mode of use of these technologies can also be viewed as an indicator of community membership. The use of current information and computer technology by scholars of English, and collectively by English departments, is a factor in determining both the scholars' and the English departments' place in the larger community of the university and the yet larger community of society as a whole, since both the university and society in general are making extensive and increasing use of computer technology. Some of the issues involved in this question of membership and perceived membership include the relationships, as mediated by the use of computer and information technology, between scholars of English and English departments on the one hand and other communities they are either a part of or interact with on the other; the transfer of ideological and methodological assumptions and procedures between the communities and its relationship to what is constituted as knowledge that goes along with the use of computer and information technology; and the possibility of

ghettoization of English studies as a “low tech” enclave within the university.

In *The Domestication of the Savage Mind*, Jack Goody discusses the issue of the “way in which modes of thought have changed over time and space” (1-2). He notes that this issue has largely been discussed in terms of a binary we/they division often distinguished as scientific thought versus magical or mythical thought. At least since the Romantics, Anglo-American literary studies have largely defined themselves in opposition to the scientific mentality. However, in the twentieth century there have also been continuous efforts to re-establish literary criticism as a science (Seamon 1989, Kristeva 1986). These efforts have often been founded on the application of linguistics to criticism and to composition theory. More broadly, the rise of literary theory in the past twenty-five years has often involved a shift towards a scientific style of argument requiring references to verifiable evidence, citations of authorities, and a clearly articulated critical methodology. Current computer and information technology has become a critical tool in scientific endeavour and in the manipulation and transmission of information generally. As such, the technology is important to branches of English studies that are in the forefront of current modes of thought.

Although the movement from traditional writing and printing technology to electronic printing and storage of text may not seem as profound as the movement from orality to literacy, the two movements are to some extent analogous. The way we communicate and store our thoughts and communications has a profound effect on the way we perceive and think about the world :

Many of the features we have taken for granted in thought and expression in literature, philosophy and science, and even in oral discourse among literates, are not directly native to human existence as such but have come into being because of the resources which the technology of writing makes available to human consciousness. (Ong 1)

Computer and electronic information technology is being increasingly used in the composition, storage, and communication of both primary and secondary textual material. As such, the technology is becoming an increasingly important condition of the environment in which texts exist and come into existence. The more deeply embedded in human culture and consciousness the new computer and information technologies become, the greater will be their effects. As scholars of texts and the conditions surrounding them, being familiar with the technology is a factor in maintaining the epistemological relevance of our discipline to the contemporary world.

Despite what some scholars might claim about the role of study in their individual lives, the act of studying is not as natural to humans as breathing, sleeping, or eating. The ability to study is dependent on a technology. Study as "abstractly sequential, classificatory, explanatory examination of phenomena or of stated truths is impossible without writing and reading. Human beings in primarily oral cultures, those untouched by writing in any form, learn a great deal and possess and practice great wisdom, but they do not 'study'" (Ong 8-9). The technology of writing augments human consciousness and allows us to study our environment by preserving the thoughts, methodologies, and feelings of others in a way that memory alone can not. Similarly, increased communications abilities, vast artificial memories, and exponentially increased speed of implementation of repetitive analytical tasks and subtasks will probably greatly alter our ability to study and understand our environment.

Whenever new technologies of manipulating words and thoughts—writing, printing, and computers—have become available, similar criticisms have been directed at them. They have been accused of destroying memory and enfeebling the mind by relieving it of too much work (Ong 79-80). True, these technologies have reduced the need to remember vast amounts of raw data and many simple relationships; but we have found much more work in manipulating and articulating more and more complex relationships among data, and we work at higher and higher levels of relationship. We move from data, to relationships and principles, to metarelationships and metaprinciples. As Ong says, one problem with criticizing the technologizing of the word by writing, print, or computers is that, to effectively criticize, we must use the same technologies [or greater] that we are criticizing (80).

As well as being criticized for promoting sloth, the written text has been criticized for being inherently untrustworthy and stubbornly resistant to questioning. When asked whether it is or ever has been involved in a given relationship with another text or with certain social or political movements, a written text says just so much and then resists incriminating itself any further. Electronic storage and hypermedial organization of texts will make the relationships between texts much easier to investigate and document. In discussing the credence given to written text versus oral testimony, Ong argues that while present-day literates generally assume that written text has more authority than orally passed down and presented evidence, earlier, less literate cultures believed the opposite. He argues that “(W)itnesses were *prima facie* more credible than texts because they could be challenged and made to defend their statements whereas texts could not”; this was also one of Plato’s objections to writing (96-97). While it remains true that texts

themselves are not sentient and thus cannot argue, the more related texts that are available and the easier it is to show those relationships, the easier it is for someone to argue for the importance or veracity of those texts. Hypermedial linkage between electronically stored texts makes relationships between texts very easy to retrieve and present. As evidence to support an argument, the relationships between texts is as important in English studies as it is in legal disputes.

Computer technology does in part facilitate a linear advance in the shift from orality to print literacy, but it moves in other directions as well. Computer technologies used in the production and analysis of texts may change the very way we perceive texts. It may change our assumptions about what kind of thing we think a text is. Ong makes an interesting point about the finality or closure and intertextuality of printed texts:

The printed text is supposed to represent the words of an author in definitive or 'final' form. For print is comfortable only with finality. Once a letterpress forme is closed, locked up, or a photolithographic plate is made, and the sheet printed, the text does not accommodate changes (erasures, insertions) so readily as do written texts. By contrast, manuscripts, with their glosses or marginal comments (which often got worked into the text in subsequent copies) were in dialogue with the world outside their own borders. They remained closer to the give-and-take of oral expression. The readers of manuscripts are less closed off from the author, less absent, than are the readers of those writing for print. The sense of closure or completeness enforced by print is at times grossly physical. A newspaper's pages are normally all filled—certain kinds of printed material are called 'fillers'—just as its lines of type are normally all justified (i.e. all exactly the same width). Print is curiously intolerant of physical incompleteness. It can convey the impression, unintentionally and subtly, but very really, that the material the text deals with is similarly complete or self-consistent. (132-133)

Computer generated and stored text is much less "complete or self-consistent" than printed text. It is much more easily changed. Depending on the storage medium, an author or authors of a text can easily enter a file and make changes as fast as they can type or even faster—faster for example if a global search and replace is used to change all or certain occurrences of a word or phrase to another word or phrase. A given version of a text can

still be preserved unchangeably however if it is stored electronically on a WORM. (Write Once Read Many) or Read Only disc. With hypermedial organization of electronically stored text, and especially in the case where the readership can author links, mass-distributed, electronically stored and distributed texts are once again easy to annotate and gloss in such a way that subsequent readers get the benefits of such additions. Pre-electronic print gave rise to the issue of intertextuality where as much as a text arises out of lived experience it also arises out of a consciousness of print-mediated organization of experience (Ong 133). Electronic text makes the creation and investigation of intertextual links easier and hence potentially richer. Masses of text can be rapidly searched for occurrences of words, phrases, or concepts for analysis or to find texts to refer to in newly created primary texts.¹ Actual chunks of texts can be copied and pasted into other texts, unchanged or reworked. Although novelists like Thomas Pynchon and others are already well known for intentional, obvious, creative thievery without the necessary use of computer generated or stored text, the process is much easier now. Given that it is much easier, it is likely to become much more common. The more common it is to treat text as violable, not closed, not final; the more common it will be to challenge the authority and the authorship of text.

In this thesis I want to argue that competence or literacy in English studies includes literacy in the use of computers and related contemporary information technologies; to present the technologies and techniques

¹ The more I deal with notions of intertextuality in general and electronically mediated manipulation of text in specific, the less sure I am of the distinctions between primary and secondary texts.

involved in computing for English studies; to discuss the future direction of computing in English studies. In order to be considered a competent or literate English scholar one has to be able to do more than take a text and articulate it in a sophisticated manner. A competent English scholar has to have a certain level of research skills: for example to search relevant bibliographies of secondary texts for a given topic; to keep up a certain level of correspondence with other specialists in her particular field. A competent English scholar also has to be able to produce a manuscript of a certain degree of legibility.

In the recent past, producing a manuscript has meant either being able to type or getting someone else to type for you. Currently very few scholars are unable to produce word-processed manuscripts, and more and more scholarly journals are requiring that hard-copy submissions be accompanied by electronic files of the submission. A basic level of scholarly literacy now includes the ability to produce word-processed text,¹ and just as many scholars have owned their own typewriters, many scholars now own their own computers. Corresponding with others in your field has meant being able to compose and produce a letter of adequate standards and use personal telecommunications technology, the telephone, for direct communication. For indirect communication it has meant publishing in the relevant journals. Producing letters now often involves word-processing,² and personal

¹ The argument that you just have to be able to get someone to word process your text for you is not really relevant, since the point I am making is not whether an individual can somehow manage to avoid developing the skill but that word processing is a skill that is becoming accepted as one of many others that is basic to the discipline.

² Where the personal touch is appropriate, hand-written letters still fill a certain niche. The changes in available technologies for transmitting written or printed text perhaps even further accentuates the form-related messages of hand-written letters.

telecommunications is increasingly involving electronic mail networks which not only carry one-to-one texts but one-to-many texts from informal lists to formal, refereed electronic journals. The more common this becomes, the more proficiency with electronic mail technology will become part of basic scholarly literacy. When it comes to research, the ability to search through the MLA and like bibliographies has certainly been part of basic English scholarly literacy for some time. The MLA bibliography is now available and very frequently used in electronic versions on-line via dial-up access and as a CD ROM (Compact Disk Read Only Memory) publication. Again, using this resource in electronic form is becoming a part of basic English scholarly literacy. As an English scholar should be able to use a concordance, soon an English scholar will be expected to be able to use electronic concordances as well as searching and concordancing software when needed.

Computer technologies are not only changing the way we work with our subject matter; they are changing the way we work with our colleagues. There is an increasing trend in both the academic and business communities towards collaborative work on projects and individual documents. Obviously, as tasks get larger it can take more people and a wider variety of skills to complete the tasks. Computer technology and electronic communications are well suited to facilitating this kind of interaction; indeed the larger and more complex a project is, the more difficult it is to complete without computer assisted interaction. This phenomenon is often referred to as interpersonal computing (IPC) and software specifically designed for it is often referred to as groupware. IPC is rapidly becoming common in both the academic and business communities, and computer hardware and software companies are developing resources to

support and encourage IPC (Fisher 27-29).

Barring strong formal, traditional, or ritual constraints, the ability to use new and more efficient and/or effective technologies to accomplish given, similar, or related tasks or procedures becomes part of the basic level of competence or literacy in a community as the community sees value in it and increasingly uses it. And as defined communities usually overlap with, subsume, and are subsumed by other communities, technologies and levels of competence or literacy also partake of similar relationships among communities. As certain levels of computer literacy become necessary for the world at large or subcommunities like the business, legal, or scientific worlds, they also flow over to the community of Humanities scholarship.

Chapter II. Hypermedia and English Studies

One of the new computer technologies that is likely to change our relationship with texts is Hypermedia. Hypermedia is a computer-based system in which textual, graphic, video, and audio elements are linked nonlinearly and can be restructured by the author.¹ This organization is provided via a window on a computer screen containing data which has multiple links to other on-line data. Hypertext² is a subset of hypermedia interlinking only textual material; it “allows authors or groups of authors to *link* information together, create *paths* through a corpus of related material, *annotate* existing texts, and create notes that point readers to either bibliographic data or the body of referenced data.” (Yankelovich and Meyrowitz 18) In practical use, and because of questions about just what constitutes a text, the terms hypermedia and hypertext are often used interchangeably. In this thesis I will use the term “hypertext” when referring specifically to computer-supported written material which may contain static graphics. I will use the term “hypermedia” for structures which may contain written material, static graphics, animated graphics, video, and/or audio material.³

Hypermedia-linked data can exist on storage media in the computer workstation where the user is working, the network to which it is attached,

¹ Here is another traditional distinction which becomes less clear with changing technologies, the distinction between author and reader or audience. If the user/reader of a hypermedia document is given the ability to create further links between data or to add data, as discussed below, then she becomes not simply a user/reader but to some extent a coauthor.

² The term “hypertext” was coined by Theodor Nelson. See Nelson 1987

³ For a discussion of a hypermedia project integrating video sources see Friedlander 1990.

or anywhere in the world that the workstation can communicate with. As computer communications develop, where data exist "physically" begins to lose its importance, if not its meaning.¹ A given datum could be linked to a definition, an explanation, or an expansion, textual or otherwise, resident in the computer's memory or on its data-storage device; data residing on large-capacity storage on the local network; or a distant data base such as the MLA bibliography on-line service.

Network-based hypermedia is to paper-based information technology as telecommunications to today's transportation technology. With paper-based information technology the user and the hard copy information have to be brought to the same physical location using surface or air transportation such as aeroplanes, boats, trains, trucks, cars, buses, feet, etc. Whether the distance involved is a ten-minute walk to the library on campus or a trip to a distant archive in another country, getting to the source of the materials or otherwise acquiring them is likely to require time for transportation that would usually be better spent studying the materials. With hypermedia-based documents and currently-available information technology, that information could be presented on screen at the click of a button and printed, if desired, at the click of another button or cut and pasted into a document that the user is creating with a few more simple hand movements. It is like the difference between taking a bus to the airport, a plane to Heathrow, and then more surface transport to Oxford to dig around in the libraries; or stepping into a matter-transmission booth and appearing

¹ Data become significant, in the form of information, where they are perceived: in the "virtual" data structures of the computer screen. See also Ronell 1989

somewhere in Oxford near the desired library on the other. The technology for sharing data across networks is already available and virtually all major Western research institutions are linked via electronic networks such as the Internet. However, there are some limitations yet to be overcome. Perhaps the simplest involves the time it will take for a substantial portion of literary works and data to be made available in electronic form (see section III below). Another limitation involves technological problems of sharing media other than text over electronic networks (Yankelovich 134).

The modern notion of hypertext began in 1945 when Vannevar Bush envisioned a non-computer-based hypertext system, a 'memex' device for storing books, records, and communications, forming trails through the documents, and rapidly retrieving information in the documents. (Bush 1945 101; Yankelovich and Meyrowitz 18) This, in part, inspired Brown University's early hypertext text editing system developed in 1967 and 1968 (Negroponte; Yankelovich and Meyrowitz 16). Research continued through the mid 1980s at Xerox's Palo Alto Research Centre on a sophisticated hypertext system (Yankelovich and Meyrowitz 18), and in the spring of the 1986-7 academic year Brown began implementation of their system, called Intermedia, in the classroom (Beeman et. al. Executive Summary 3). In 1987 Apple Computer released the first widely available hypermedia authoring environment, HyperCard, providing it free with the purchase of a Macintosh computer, and hypermedia started to become a part of the general public's awareness. In 1989 Intermedia was released for general distribution. Other similar hypermedia authoring environments, such as Supercard, Plus, Guide, and Hyperpad have also been released for the Macintosh and other microcomputers. Various academic, commercial, and public-domain data products using these authoring environments are

rapidly appearing. As would be expected, their quality and utility varies. They range from simple flat data documents to interactive children's stories to sophisticated arrangements of multimedia data.¹

The Intermedia system developed at the Institute for Research in Information and Scholarship (IRIS) at Brown University is one of the most ambitious implementations of a hypermedia-based scholar's environment. As its assessors say:

Intermedia is defined by its designers as "a multimedia hypertext system for research and education." As we discovered in our investigation of its development and use at Brown, Intermedia also proved to be a method of organizing and presenting ideas, a method of communication, and a philosophy of research and teaching—all of which were facilitated by advanced computer technology. (Beeman et. al. 1)

If one of the main professed aims of a university education is to develop in students an ability to think critically, multicausally, nonlinearly, or pluralistically, traditional pedagogies and use of university resources create some obstacles to the achievement of this goal.

Many logistical difficulties face the instructor in this pursuit. First, students typically lack the knowledge base that serves as the critical foundation for pluralistic thinking. Second, students and instructors meet at disjointed, infrequent intervals. Third, the material in a course of instruction must be laid out in a lineal fashion, piecemeal over the course of several months. Fourth, the material is disjunctive: lectures, readings, exercises and examinations are all sprinkled throughout the semester in which the course is taught. Finally, students themselves are left to interrelate this disjunct material the best they can largely by themselves. The proof of their success usually lies in their performance on examinations, which all too often become the most meaningful integrative exercise they undertake in the course. Every

¹ A simple "flat" data document consists of data and links between them as in an encyclopedia which has notes pointing to related data for a given entry. A hypermedia document loses its flatness as it gains functions such as computer-aided assistance for the user, the ability to track and record the user's movement through the document, automatic or computer-prompted modification of the contained data, and the ability for the user to add further links among the document's data or between documents. For a survey of current hypermedia theory and application in the humanities and further discussions of hypermedia see Barret 1988 1989; Delany and Landow 1991; Nelson 1987.

instructor feels mixed happiness and sadness when, as often happens, he or she hears from students: "I didn't really know what this course was about until I wrote the final exam." (Beeman et. al. 4)

I would add to this that a further impediment to students' development of pluralistic thinking is the frequent unavailability of necessary resource materials. An obvious case would be a secondary source for a student's essay not being available in the library, making it difficult or impossible to follow a line of argument as far as it should be followed for a given level of sophistication. More subtly, the fact that a student has to go all the way to the library and/or search manually through the large volume of textual material in the library or even in just a given book or journal largely limits a student's ability to follow multiple lines of investigation, or even one line of investigation in its subtle variations. Insights are sometimes very fragile things, and having to postpone the development of an insight, especially in its nascence, because one can't find further resources to feed it can often lead to its death. It is no wonder that academic libraries sometimes seem to be underutilized by undergraduates and that those undergraduates find it difficult to think nonlinearly. The two facts are related in that it takes remarkable mental faculties or powerful lineal organization to make available instantaneously the insights and bits and pieces that a sophisticated argument is created from. Electronic data libraries and hypermedia research and teaching tools can go a long way towards reducing the limits on students' abilities to follow their investigations and develop their arguments.

Against this, it might be argued that having a computer search for you prevents you from encountering those bits of information that often lead to valuable serendipitous discoveries. I would counter with two arguments.

One is that, despite our illusions of intellectual freedom, it is often more important to complete the task at hand than it is to start another investigation; electronic searching can greatly speed up the completion of that task so a new investigation can be started all the sooner. Two, those tantalizing bits often show up in the returned data anyhow. The computer does not hide information; with most search procedures it merely selects data according to the search criteria input by the user and then tells the user where the data was found. A word search will show the user the context surrounding the word which the user is free to examine more closely or not. A search of hypermedia-organized material will not only show the immediate surrounding text as context, but it will also show whatever links to further text or other media the hypermedia author(s) or users have included. During more detailed reading of the indicated sources, the user is quite as likely to encounter the serendipity-inspiring data. In effect, what the computer has done is to give the user a further degree of freedom. She can use the data supplied in the search as sufficient, go poking around in the areas from which the search has provided data and which suggest profitable investigation, or anything in between. Rather than narrow down a researcher's probable field of inquiry, the ability to search electronically provides rapid indications of potentially rich data sources. (See p. 31 below for discussion of a sample search of *Moby Dick*.) So, with computer assistance one still has the choice of completing the task at hand or following other promising trails; but with computer assistance the scholar can more quickly finish the task at hand and then easily follow other promising trails. It is even possible to have the computer create a log of one's activities so it is easy to mark and find those trails.

George Landow, the primary developer of the English studies aspect of

Intermedia (*Context 32*), develops this point in his rationale for hypermedia as a pedagogical tool. His primary goal for Intermedia was “to create an expansive source of extraliterary, contextual knowledge which would mediate between student preparation and classroom discussion” (Beeman et. al. 40). Landow believed that if instead of relying on the instructor and class time for instruction in data surrounding the text, students could come to class with a base of this knowledge, they could “critique the literature from an established contextual foundation” and the instructor could concentrate on helping them through this process (Beeman et. al. 40).¹ These contextual sources would be applied along with textual sources to issues raised in the literature studied to develop the multicausal reasoning skills necessary to advanced scholarship. Landow explains what he means by multicausal reasoning in his course syllabus:

If this course has one central idea, it is that no literary phenomenon—no work, part of a work, or idea about one—can ever be explained by a single fact. All literature. . . is multi-determined, by which we mean that multiple causes impinge upon each fact. Dickens may write a particularly great novel in a certain way because, 1) he needed money, 2) he worked out his own psychological problems in writing it, 3) he confronted and challenged past and contemporary novels and novelists, 4) he wished to convince his readers to think about the world in a certain way—and so on. All are explanations, and they don't conflict with one another. (Beeman et. al. 41)

Landow believed that contextual information was of vital importance to the development of intellectual sophistication, but that two obstacles often interfered: “Either students don't have enough background or they don't

¹ While print materials could contain much of the same information as hypermedia-based sources, excepting video and audio resources, the difficulty of gathering all the resources in a single convenient location and the inability to create the links available via hypermedia might make it less likely that the students would have practical access to the same amount and relation of data as available via hypermedia.

know what to do with their knowledge if they have read a lot" (Beeman et. al. 41). Instead of the traditional, inadequate method of spoonfeeding students, Landow sought to nurture a "community of discourse" in which students refined their analytic skills by devising their own interpretations of assigned readings and criticizing those of their classmates" by using *Context 32* as a method for mediating between student preparation and the discussion process (Beeman et. al. 41).

Context 32 was not intended to replace any single component of the English literature survey course that existed before *Intermedia*, but it was expected to reduce the amount of time spent on presenting background material in lecture by functioning as an electronic encyclopedia. As Landow says:

If they could find this [background information] for themselves on the computer, we could spend more time in class having them make connections and talk about the work.... So, again and again, the point of this is to provide the various contexts which have not been present in the classroom or even in their textbooks. (Beeman et. al. 42)

So, as well as serving as simply an information source this approach frees the instructor from the roles of "ultimate source of knowledge in class" (Beeman et al 42) allowing him to guide discussion and allowing students increased responsibility for guiding their own learning processes.

In addition to providing information *Context 32* also provided a model for understanding the connections between information and multiple causality. By following their own paths through primary sources, literary analysis, and background material, students would begin to see new patterns of relationship among writers, works, and their social, historical, and technological environment, ideally learning habits of sophisticated critical reasoning in the process. These connections and habits of analysis would

then be brought to class discussion and, of course, to the student's written work.

Chapter III. Machine-Readable Text and Computer-Assisted Text Management.

Another group of computer technologies that can greatly assist a literary scholar's or student's ability to deal with increasingly large amounts of texts and the relationships among them are machine-readable texts and computer-assisted text management. For a computer to assist text analysis or assist in managing text, the computer must be able to read the text. Most, if not all of the computer-based technologies here discussed are based on the ability of the computer to encode and recognize text. For the scholar of English though, the notion of machine-readable text has special emphasis on literary and critical texts that are readable and therefore analysable and manageable by computer. In her article "Text Management Software," Sue Stigleman "presents a taxonomy of software for retrieving and manipulating text" (5). She divides text-management software into five categories: text retrieval, text database managers, bibliography formatting, hypertext, and text analysis. As she suggests, the proliferation of electronic text and the increasing availability of primary texts in electronic form is creating a need for software that can handle large amounts of text.

Stigleman provides the following reasons for specialized text-management software's advantages over database software:

First, while typical database entries do not vary greatly in length, and database software's field structure often reflects this, text entries may vary from a phrase to many pages. Text-management software usually has variable length storage.

Second, most text-management software is better suited to handling repeating values, e.g., multiple authors and keywords, than typical

database software.

Third, text-management software can generally handle larger entries than database software. Text-management software is beginning to add support for mass storage media such as CD-ROMs (Compact Disc Read Only Memory).

Fourth, some text-management software provides multilingual support, a feature that is less common in database software.

Fifth, some text-management software has search features well suited to finding synonyms and variations in capitalization, spelling, and word forms. Again this feature is much less common in database software.

Sixth, text-management software generally has much more flexible search techniques, the heart of text management, than database software. Text-managers can search for precise or imprecise matches to words or phrases, employ Boolean operators (and, or, not), and search for words in varying proximity to each other.

In a field such as English studies, multilingual support and fuzzy searching can be very useful. When dealing with literature we must be able to handle data concerning literary connections across languages. And when searching single or multiple texts or secondary materials, fuzzy searches make it easier to search for ideas expressed in various word forms.

Software in Stigleman's first category, text-retrieval software, searches for words or phrases. The more useful and powerful of this category can do Boolean and proximity searches with two or more words or phrases. Other options include the ability to search varieties of file types created with different programs (e.g., database, hypermedia, word processing) and save the found text with a user-defined amount of context to a file along with information such as the file, location in the file where the text was found as

well as halting so the user can view each find. One obvious use for English studies is to search groups of texts for expressions of the same or similar ideas or stylistic/linguistic patterns.

Category two, text-database management software is used to create files or databases of text entries of various sizes. The primary distinctions between text-retrieval software and text-database management software are that text-database management software has the capability for data entry by the user while text-retrieval software does not and text-database management software is limited to search and retrieval from its own files while text-retrieval software typically can search files created by other programs. Because the sources that text-database management software searches are usually smaller than that of text-retrieval software, text-database management software usually functions much more quickly than text-retrieval software. Text-database management software is used for organizing and relating textual data rather than simply finding text. The uses for text-database management software in English studies include databases of reminders, letters, research subject text, research notes, bibliographic material, course material etc. Text-database managers may be relational or nonrelational. Relational databases allow linking of different records so a change in one record is reflected in those other records linked to it.

Bibliography-formatting software, the third category, is in part a subset, or at least related to text-database management software. Bibliography-formatting software is used to create a database of citations in which a bibliographic entry need only be input once but can be transformed into a variety of formats, depending on the needs of the moment. This software usually has the ability to store notes with each citation. The ability to have

an efficient and effective database of annotated citations and resources is of obvious utility to English studies.

The fourth category of software, hypertext/hypermedia software is described in detail elsewhere in this paper; briefly, it allows the interconnection of textual and other data in such a way that users can follow a predefined path through the data or create their own path depending on their interests.

The last category of software that Stigleman mentions is text-analysis software, a loose collection of software that performs either concordancing, coding, or statistical analysis.

Concordancing software can generate lists of words in text, from a list of all words to words selected by some criteria, e.g., nouns, names, prefixes. Some of this software allows annotation that can be used for such things as translations, phonetic transcriptions, grammatical categorisation, intonation, rhythm, etc.

Coding software allows the user to assign codes to sections of text for later retrieval. For example, a piece of text might be coded for subject matter or because it is related to another topic where neither the subject or related topic are mentioned explicitly. Although search software is becoming more sophisticated and faster and thus performing some of the functions of coding software, coding software still has some advantages: for example, if the topic or related subject of a section of text was marital relations but no linguistic variant of the word "marry" was present, coding software could still retrieve a reference but search software would fail if it was instructed to search for those linguistic variants. An emergent standard in the Humanities is the Standard Generalized Mark-up Language (SGML). SGML allows electronic text to be marked with tags or descriptions which

can then be searched or sorted electronically. For example, speeches in a play could be tagged so that we could retrieve all the speeches by a given character. As Michael Sperberg-McQueen, an authority on SGML, says, "SGML is a (means of defining) markup languages. Markup languages are used to mark characteristics of text for storage or interchange, or to guide processing by systems which have been told (separately) what to make of the markup and what to *do* when they see it." (Sperberg-McQueen 14 February 1990).

Statistical-analysis software counts textual components such as unique words, frequency of specific words or word variants, or word distribution throughout the text. In general, text-analysis software can be very useful in literary and linguistic analysis of texts to do such things as examining an author's or even a group of authors' themes, or to compare texts of unknown or disputed authorship to texts of more certain authorship for patterns which might help determine authorship. Another use of text-analysis software that Stigleman doesn't mention specifically is to compare different editions of a text. The user takes two different editions and compares the two electronic files for textual differences. The software can detect such differences between files as spelling, punctuation, or the presence or absence of blocks of text. As text-management software and software that is not specifically text-management oriented (e.g., database) increase in sophistication and flexibility (generally termed "power"), the present trend for more of the functions of these various categories to appear in individual software packages will continue.

In *Computation Into Criticism*, J.F. Burrows provides an example of how electronic text analysis can be used to further the ends of literary criticism. Burrows argues that one-third to two-fifths of the contents of most prose

texts are neglected, consisting of what are usually seen as “harmless drudge” (1) words by textual critics, words such as ‘to’, ‘that’, ‘for’, ‘all’, ‘the’, ‘of’, ‘I’, and ‘not’. As Burrows says:

The neglected third, two-fifths, or half of our material has light of its own to shed on the meaning of one novel or another; on subtle relationships between narrative and dialogue, character and character; on less direct and less limited comparisons between novels and between novelists; and ultimately on the very processes of reading itself. (It seems likely, too, that the evidence of the very common words can enhance our understanding of the connections between the language of literature and the ‘natural language’ of more everyday discourse: I have scarcely entered upon that phase of my research and it forms no part of the present study.) The evidence of the very common words bears, at times, on questions hotly contested in the critical and scholarly controversies of recent years, reinforcing received opinion on one point or indicating its deficiencies on another. At other times, the evidence increases our understanding in areas where literary criticism has seldom found firm ground. My chief object, however, is much less to show how the evidence favours one doctrine at the expense of another than to show that exact evidence, often couched in the unfamiliar language of statistics, does have a distinct bearing on questions of importance in the territory of literary interpretation and judgement. (Burrows 2)

For example, Burrows uses computer-based concordances and statistical-analysis software to compare the incidence of words in the dialogue of different characters in Jane Austen. The following table is a simple example of what is generated:

TABLE 1. Differences of Incidence: Four Words in Three Idiolects

	Catherine	Henry	Isabella	Mean ¹	Mean ²
the	16.34	35.29	25.81	24.61	26.45
of	15.91	29.92	17.32	20.71	23.69
I	56.68	24.56	52.86	43.69	38.75
not	26.99	12.69	19.62	19.12	16.14

Mean¹: overall incidence in dialogue of *Northanger Abbey*

Mean² overall incidence in dialogue of Jane Austen’s six novels (Burrows 3)

What this table demonstrates is that there is a dissimilar distribution of words which might be expected to display a similar distribution among different characters. As for the significance of such analysis, Burrows says:

However narrow the linguistic function of words like these, it is evident that if, as is indeed the case, disparities like these are typical of the language of Jane Austen's major characters, the effects must colour every speech they make and leave *some* impression in the minds of her readers. Even for the most attentive novel-reader, such an impression need not—and seldom does?—consist in a definite recognition that someone is peculiarly given, for example, to the use of 'I' and 'not' and has little recourse to 'the' or 'of'. It would ordinarily consist in an awareness, however inarticulate, of the larger implications—grammatical, semantic, psychological, social—that are marked by such peculiarities. Statistical analysis of the peculiarities of incidence makes it possible to approach the whole penumbra of 'meaning' in a new and fruitful way.

From no other evidence than a statistical analysis of the relative frequencies of the very common words, it is possible to differentiate sharply and appropriately among the idiolects of Jane Austen's characters and even to trace the ways in which an idiolect can develop in the course of a novel. (Burrows 4)

Burrows goes on to point out that this kind of analysis is useful in studying the development of characters, their similarities and differences as compared with each other, and their changes in speech and behaviour when involved in different sorts of interactions with each other.

The simplest form of electronic analysis of text and probably the most often used is searching for word roots, words or phrases. As a practical experiment on Melville's *Moby Dick* (which I happened to be reading), I searched for words relating to the issue of whiteness. I first typed up a list of synonyms for words often associated with whiteness or paleness, then used a thesaurus program to look for rough synonyms and related words. I then began the search using the program *GOfer* which allows Boolean searches for groups of up to eight words or phrases at a time. During the search I added a few more words to the list that I noticed showing up on

screen associated with the words I was currently searching for. The list of words and word portions is as follows:

alabaster	bloodless	colour	haggard	milk	snow
albin	chalk	cream	hoar	pale	stain
anaem	chaste	fade	ivor	pall	wan
anem	clean	fair	lifeless	pure	wax
ash	clear	frost	light	puri	white
blanch	color	gaunt	lime	sallow	yellow

I set the options on *GOfer* to save to disk each find with the five lines of text either side of it. The resulting file is much too large to print here, but as an example see Appendix A for a portion of the finds for “pall” which will give pallor, pallid, appall, etc. The search for these words or portions of words, if done without the help of a computer would take minimum of months if not years. The initial search for the above thirty-six words or word portions took less than one half hour including determining them and typing them into *GOfer*.

Of course the work doesn't end here. Certain words like “ash” and “wan” show up as elements of other words where they are irrelevant for the purposes here. One possible next step would be to identify examples of situations where this occurs and redesign the search to avoid as many as possible of such occurrences. It is not as simple as setting a whole-word option on a search because the search would miss occurrences such as ashen or waning. Another approach would be to research for occurrences of the words identifying which forms occur and then make another list of all those forms and research for just those. Alternately the irrelevant finds

could be identified and deleted with their surrounding text. Once the user has determined just what is relevant and what is not, she can begin whatever analysis of the relevant passages she intends.

If this search procedure was being used as part of a discovery process rather than identification of passages for an already-identified purpose, the computer's text analysis capabilities could still be useful. The user could use software to take the file(s) resulting from the search(es) and list them according to frequency of occurrence. This might result in identification of unusually frequent occurrences of certain words in relationship to the searched-for words.

Chapter IV. The English Scholar's Workstation.

New technologies for working with texts could be integrated in a hypermedia-based environment that would support most of an English student's or scholar's research and analysis. This "English Scholar's Workstation" is not a rigid formula for how scholars and students should use computers in their endeavours; rather it is a package of related technologies designed to assist and meet as many of their needs as possible. Here I will first describe the organization of the English Scholar's Workstation and the technologies it gathers together; then I will conclude with some thoughts on the synergistic effect of combining so many resources in a single environment.

An English Scholar's Workstation can be defined as an individual or "desk-top" computer, able to access textual resources, and equipped with a battery of text-handling programs. To take advantage of current possibilities, such a computer should have the power of a true workstation rather than just a "personal computer." At the time of writing, a workstation will have the following minimum features:

Central processor running at 15 million instructions per second

8 MB of Random Access Memory

100 MB hard disk

Large-screen, high definition monitor

Graphical Interface (GUI)

High-speed connection to local and wide-area networks

Ability to run the UNIX operating system and support multi-tasking

Although this may seem to some like unnecessarily powerful or exotic hardware, there are often times when I push similar configurations to the limit. English scholars using networked computers will often find themselves working on a paper or article while needing to search or run an analysis of a large textbase, possibly a remote text base which they are connected to via a network, and wishing to send a related query via e-mail. When you are hot on the trail of an idea or insight, having to wait for one task to be completed and then quit various programs and sever various network connections before starting the next task can result in significant cooling of the trail. Speed and memory are necessary to accomplish this sort of multi-tasking (running several programs concurrently); and a large screen is needed to display the windows, so the user can keep track of all the processes running concurrently. UNIX also provides native text analysis functions that are less commonly available with other operating systems.

Software features of the ESW would include multi-tasking and the ability to handle large text-files. Experience with hypermedia suggests that it could be used, on an ESW, to integrate "off-the-shelf" and custom software in an over-all structure consisting of a number of levels. Given that computer-based information technology frees the conceptualization of intratextual and intertextual relationships from the physical restrictions of paper's two dimensions, and in general the physical fixed form of the book, the metaphor used to describe the structure of the software is bound to be a problem. Figure 1 represents the first or entry level of the ESW, as a system of satellites where each location and node is surrounded by and linked to other locations and nodes. For example, in one dimension a user could move linearly from the nineteenth century, to Anne Brontë, to *Agnes Grey*,

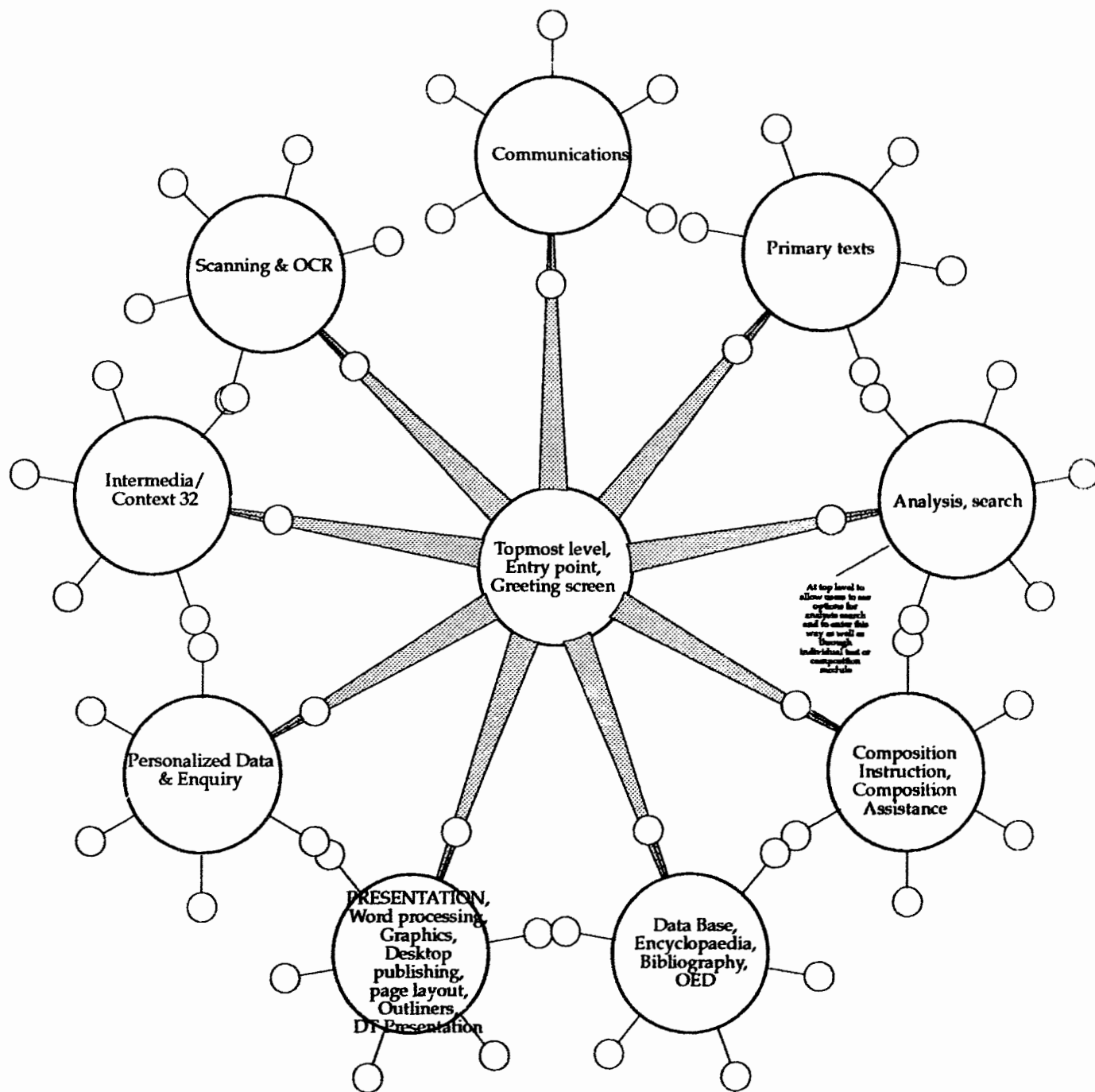


Figure 1.

to analysis or criticism of *Agnes Grey*. Or a user could move laterally from any node to a related node at a similar logical level, e.g., from Anne Brontë to Emily or Charlotte Brontë or from *Agnes Grey* to *The Tenant of Wildfell Hall*.

This satellite structure is designed as a navigational aid for the user so that she will have some idea where she is in the overall body of data. I prefer to use a satellite metaphor as opposed to a tree-diagram metaphor because of the connotations of two-dimensional limits associated with a tree diagram. A tree diagram even removes one dimension from the tree it is supposed to be a metaphor of.

With hypermedia we can also move from a given node to another node that does not conveniently fit into a two-dimensional logical hierarchy, e.g., from a given word or phrase in a text we can move at the touch of a button to a related word or phrase in a text that was written before or after, to a passage in the same or another text that is related thematically or ideologically, to an audio recording of that passage or an audio pronunciation in the case of a foreign or archaic word, to a video presentation of the word and context as in the case of drama, to a definition or explanation of an obscure word or obscure implications of a word in a specific context, or to a graphic representation of an unfamiliar object to which the word or phrase might refer. Obviously, these different possible destinations stretch the limits of a two-dimensional metaphor.

A user sophisticated in hypermedia navigation will be able to by-pass this organizational structure and go directly to wherever she chooses. Hence, the most appropriate metaphor and the one I would hope the next generation of computer users will be comfortable with is a four-dimensional metaphor.¹ As a generation of users grows up with hypermedially-organized

¹ For an introduction to the fourth dimension and current theories surrounding it see Rucker.

information from their early educational years on, they will be more used to moving from a selection of data to another selection of data that fits in more than one logical relation to a given text they are interacting with. The problem is then how to conceptualize this complex logical relation in spatial terms, since it is probably nigh impossible not to attempt doing so to some extent. A three-dimensional metaphor eventually becomes inadequate. If you can jump from one data location to another metaphorically distant without following a known route between them, how do you reconcile the fact that these two loci can seem be in more than one relation to each other at the same time? Obviously we know that relationships among information are not bound by the apparent physical laws of the three physical dimensions that we are most familiar with, but what I am trying to deal with, and what the users of the ESW and other complex hypermedia systems are and will be trying to deal with, is an organizational metaphor for complex data structures. One could simplify it, and a simple version of the system is necessary for unsophisticated users; but simplifying things increases the difficulty of working in the direction of understanding the complexity of the infinite relations existing among the data within the field loosely defined as English Studies.¹

Here is a another aspect of the problem. If you look at the hierarchical satellite metaphor for hypermedia organization and take the defined entry point, the greeting screen (or any other point for that matter), you can move out along one of X number of links to other nodes to another node that has another choice of X number of links to other nodes and continue this

¹ There is a similar problem with all the particles in the cosmos.

process. Given that the nodes or bodies of data they are associated with do not necessarily get smaller the farther away you get from your original node or point of departure, you soon run out of metaphorical space,¹ unless the links between nodes and datum are hugely long. The links, being near instantaneous, certainly do not *feel* hugely long. So, if a user wants to jump to a location without following the predefined organizational or logical route, she must be able to fold or collapse her metaphorical space in a number of different ways and step across the fold through the fourth dimension. If we cannot do that, we are facing either a very simplistic understanding of the relationships between chunks of data or a “black box”² in terms of these relationships. Neither case facilitates a deeper understanding of either English studies or human knowledge. In the case of a simplistic understanding the scholar may be left with just that: a simplistic understanding and severe limitations on her career as a scholar. In the second case she may be left with the links within her understanding of English studies being mediated largely by the black box and not much of an understanding as a result.

What are needed then are several different, but related organizational metaphors for several different levels of sophistication. We need two-, three-, and four-dimensional metaphors to assist those desiring or needing

¹ If you are going to use a metaphor for navigational purposes and to foster some understanding of an unfamiliar concept like hypermedia, you might as well be as consistent as possible with it. If the user is making an analogy between a body of data and a three-dimensional space and thinking of moving through three-dimensional space from one group of data to another, the user can run out of metaphorical space in which to imagine these data.

² A “black box” refers to a situation where we know the input and the output of a process but we do not understand the actual functioning or steps of the process by which the input is transformed into the output.

this sort of metaphor for orientation.

The satellite structure of function and data locations and nodes is arranged according to a compromise between their logical hierarchical position and the frequency with which they will be visited. There is also occasionally some ambiguity concerning a given function's or data document's logical place in the hierarchy, depending on a user's perspective. For example, on one occasion a user would go through a data base node to get to a resource such as the MLA Bibliography which would contain specific data. On another occasion a user would want to go directly to a personalized, individual, or user-created data document. Thus, nodes leading to databases in general and to a list of particular database documents might arguably belong at the same level.

Entry Level

The standard entry point will contain a greeting screen representing the next level of possible destinations consisting of nodes leading to facilities for dealing with communications, primary texts, analysis and search, composition instruction and assistance, databases, presentation, personalized data and enquiry, Intermedia and Context 32, and scanning and optical character recognition. Each of these nodes then contain further and generally more specific destination nodes and/or facilities.

Of the nine nodes at the entry point—communications, primary texts, analysis and search, composition instruction and assistance, databases, personalized data and enquiry, presentation, Intermedia and Context 32, and scanning and optical character recognition—six deal with traditional aspects of literary analysis and the other three serve related functions. Literary analysis is not a continuous process. We do it for a given period of

time, leave it to do other things in our lives, and then come back to our analysis. Even here it is not quite this simply quantified. While cooking or eating meals or travelling we are often thinking about our projects or reviewing events in our reading such as Katje's ritualized disciplining of Brigadier Pudding in *Gravity's Rainbow*. When we more or less leave and return to our analyses we often withdraw and enter at different stages or subprocesses in the larger process of a given project. The ESW is meant to reflect those subprocesses and stages.

Since literary analysis is not a completely solitary function, the communications node facilitates the communication with others participating in the community described by its literary knowledge, the communication which is an important primary function in the pursuit and creation of that literary knowledge. The primary texts node contains the primary texts which are arguably near the centre of literary analysis and thus deserve a similar position in the ESW metaphor. The textual analysis node contains the software for the textual analysis and searching within texts or groups of texts which is often done and redone many times and at many stages of a given project. The database node is for the results of search and analysis which are often entered into a database or filing system of some sort. Resultant personalized documents may be repeatedly modified and worked from, so the user may want to group them around nodes of their own for immediate access. The results of a project or stages of a project are often if not usually presented to members or potential members of the community that does literary analysis. This presentation most often takes the form of written texts such as articles and books, and oratory such as lectures, seminars, and conference presentations but it could be a full-blown multimedia presentation involving any of the text and oratory as well as

graphics, video, and audio media. Hence the presentation node will contain the software to prepare and present these materials.

The functions of the remaining three nodes do not fit conveniently into the same category. Composition instruction and assistance is related to but certainly not dependent on or subservient to literary analysis. It is necessarily involved with the presentation of the results of literary analysis but is also a study or group of studies in its own right. Another node contains Intermedia with its subset, Context 32, which is a hypermedia project and application from which some of the inspiration for the ESW was drawn. Scanning and optical character recognition are very important utilities for the reproduction of textual and graphic data useful at most stages of the analytical and instructional process and are contained in their own node.

Communications and Virtual Classrooms

E-mail

The communications node will connect to local and wide-area electronic mail (e-mail) facilities. At present, such e-mail networks are often separate, requiring different software to operate. Local e-mail is usually restricted to a local network of microcomputers (i.e., a small group of micros within walking distance of each other) while nonlocal e-mail is routed through a mainframe computer to a mainframe terminal, or individual or networks of mini or microcomputers connected to the same mainframe computer or to another mainframe computer. However as available software technology improves, the distinctions between local and nonlocal e-mail are decreasing.

The local e-mail connections would be within the local network, e.g., the

English department, and will primarily consist of moving around data originating in the department or locally distributing data which originates outside the department. For example, a faculty or staff member could send out announcements, personal mail, or requests for information to any other individual or group of individuals with access to the network.¹

Nonlocal e-mail may be defined as moving between the local network and destinations outside that network. Outside the network may be locations within the institution, within nearby institutions, or around the world.

Computers in private offices and in the computer laboratory of the English department at Simon Fraser University are now being connected to the high-speed communications wiring or backbone of the university. This allows for very fast transfer of large amounts of data within the university and between sites on BCNet such as Simon Fraser University, the University of British Columbia, and the University of Victoria. Sharing files between sites or printing directly to a printer at any other site now becomes a very simple and quick process.

E-mail began as a way of sending messages between users on computers; the messages typically had to be typed in before transmission and were limited in length. Such systems started coming into common use on university campuses in the early nineteen-nineties. There has been rapid development in this mode of communication and a related mode, "file transfer", between computers. The current state-of-the-art e-mail system is "NeXT mail" for NeXT computers. "NeXT mail" is an integrated system for

¹ Bitnet and Internet, the main large-scale networks that connect academic institutions, are effective for all of North America as well as most of Europe and into the Middle East.

transmitting, in message form, any or all of the following: text messages, graphics (such as a digitised picture of Thomas Pynchon), files, programs, and sound messages.¹ While e-mail can obviously carry most data a user might want to put into the system its two main official functions will be the transmission of administrative and academic data, although there is certainly nothing preventing one from maintaining academic connections in the form of a message to one's old thesis adviser at Oxford inquiring as to the variability in quality of the Guinness at his local. Administrative data might take the form of grades, scheduling, class composition, etc. via the local network, or it might be a request for admission requirements or program structure from another institution in another country. Academic data might be exchanged via a link to a database residing on a central server,² one-to-one via individual users, or through forums or mailing lists—again these may be local or international. Such data might be books, articles, or just informal discussions. Paul Delany and I collaborated via e-mail extensively with George Landow, co-editor with Paul of the book *Hypermedia and Literary Studies*, and with some of the contributors to the book. Such electronic collaboration greatly speeded up certain phases of production of the book which was taken to electronic, camera-ready copy right in our office in the English department at Simon Fraser University, using a Macintosh Iix

¹ Transmitting graphics for display in an e-mail document can be a problem at present if different computer systems are involved because of the different graphics standards involved. Graphic documents or documents containing graphics can be transmitted however using file transfer protocols and encoding and decoding procedures.

² A central server is a data storage device, e.g., a large hard disk, that can store data for and be accessed by all computers on the local network. It may even be made available to computers connected more distantly than the local network.

computer and page-layout software.¹ Over an electronic network students can collaborate on an essay within the computer lab² or faculty can collaborate on papers and books on different continents. Turn-around time for a document to be transmitted between North America and Britain, read, and transmitted back again with changes or comments can be as little as several hours. In the English Department at Simon Fraser University, Professors Paul Delany and Alan Rudrum have set up forums via e-mail and encouraged one-to-one e-mail so that a class, professor, and teaching assistants can easily exchange queries, information, and opinions. A given forum can be structured for any range of member participation or topics.

Conferencing

Nonlocal conferencing systems have an even greater potential for increasing the efficiency of academic exchange. Such forums vary in formality, academic quality, and degree of editing, but they provide a speed, breadth, and wealth of academic interaction far outstripping the traditional methods of communication available before the widespread use of computers. A refereed electronic journal is similar to a refereed printed journal in formality and quality of subject matter; the difference lies in the

¹ For a discussion of electronic books, electronic libraries, and electronic book production see the articles by Yankelovich et al., "Reading and Writing the Electronic Book", and by Yankelovich, "From Electronic Books to Electronic Libraries: Revisiting 'Reading and Writing the Electronic Book'" in Delany and Landow, *Hypermedia and Literary Studies*.

The page-layout software used was PageMaker 4.0 by Aldus Corporation.

² There are a great variety of opinions and study results on the value for writing instruction of student collaboration and conferencing on computers. For a sampling see Batson 1988, 1991, Cooper and Selfe 1990, Fowles 1990, Schriner and Rice 1989.

shorter time it takes to get from the contributor's desk to the subscriber's desk. An edited list like *Humanist* will generally be less formal, consisting of queries, responses, newsletters, notices, discussions among members and the like with occasional formal papers. An unedited list like *MBU-L* will generally be less formal still containing the same sorts of material as an edited list but containing also informal comments, quips, and sometimes even short messages from one individual to another. Some forums or lists often have membership requirements while others are open to anyone with access to the network.

Anyone with appropriate access to the computer network and who fulfils the criteria for membership as defined by the administrator(s) of a forum or list can join a forum. For some however, this wide access might result in more e-mail than they are prepared to deal with. Two ways to deal with this are either to use a piece of software that will filter incoming mail according to criteria, e.g., by subject, keyword, or sender, or to store all the mail from a given forum or list so that those interested can search it at their inclination using search software. It is a simple matter for any individual user to archive their personal e-mail and store it on disk for use in the office or at home.¹ Most forums/lists are run automatically to varying degrees, and virtually all of them archive the messages that have been distributed. One can send a message to the listserver to obtain either a list of the archived material or the archived material itself if one knows the name of the archive file. A listserver is, at the most simple level, a piece of software that receives a message sent to a forum/list and resends it to the members of a

¹ I have been archiving on a microcomputer all the messages to and from *Humanist* since May 1989.

forum/list as defined in an electronic file. It can be set to automatically perform a number of other functions as well, such as adding new members in response to requests sent by those potential new members, deleting members at their request, and creating and managing archives. The listserver function is actually performed by listserver software at a number of different sites on a given international e-mail network such as Bitnet.

The largest of these systems is NetNews, which links computers worldwide. NetNews has a hierarchical structure of conference groups; overall, it handles more than 100,000 contributions per week, with an emphasis on technical computing issues. There are many other conferencing groups on Bitnet and Internet. As a representation of the range of e-mail forums relating to English and the Humanities in general, I will discuss seven international forums that I have subscribed to. The first, *Humanist* is oriented towards exchange of information in any of the Humanities with an emphasis on the applications of new information technology for the Humanities. The content of a given exchange often has nothing to do with technology as a subject, but may be a request for data or sources for data. (See Appendix B for a sample of queries and responses from *Humanist*.) *Humanist* is edited at present by Elaine Brennan & Allen Renear, at Brown University, and membership is largely restricted to graduate students, faculty, researchers, and staff of educational institutions. The second forum, *English* is oriented towards, as the name would suggest, the subject matter of English and its interaction with new information technology. It is edited at present by Tom Ryan from the English Department of the University of Texas at Arlington and membership is restricted, similarly to *Humanist*.

Another forum, *Literary* is dedicated to topics of a generally literary nature, including manuscripts of literary works sent by the authors to the

mailing list for the member's consumption. Like the fourth e-mail forum, *SF Lovers* which is dedicated to discussions of Science Fiction, *Literary* is quite informal and membership is unrestricted.¹

After reading occasional communication about Thomas Pynchon and his works on other lists, I made queries on various lists to determine whether or not there was a forum or list dedicated to him and his works. There was not, so after communication with Stuart Moulthrop, a Pynchon scholar (see below), I started one. It is resident on our mainframe computer at Simon Fraser University. We do not have listserver software under MTS at SFU, so I run the list manually, as it were.² *Pynchon* is unrestricted and informal. Most members are from the US with some from Canada and others from Ireland, England, and Israel. Started in February of 1990, membership took less than one month to reach fifty and now sits at one hundred and five (fall 1991). About one hundred and eight contributions have been posted to the list. To let the world of pynchophiles know about the list *Pynchon* I announced it in various other lists and forums and in the printed publication *Pynchon Notes*. Message frequency varies from several a day (rarely) to none for weeks. The silence is usually broken by a request for information, an insight someone wants to share or discuss, notice of a Pynchon-related event, or a new member announcing her membership in the group. Given that membership to *Pynchon* is unrestricted and not formally edited, I

¹ As a minor example of the available technology, while writing the original draft of this document on my microcomputer, I accessed the above information by signing on to the mainframe e-mail facilities and reading the e-mail documents containing the needed information.

² This involves adding and deleting members myself from the mailgroup. The list is composed of a mailgroup and a list of remote addresses. I first list a member's name and e-mail address and then add his name to the membership list for the group, *Pynchon*.

feared that traffic might establish a pattern of either being primarily trivial and unsophisticated, or esoteric to the point of inaccessibility to someone not steeped in both critical theory and Pynchon lore. Luckily, such was not the case. Certainly, not every message will be of interest to every member, but, as I hoped, much of it is accessible to Pynchon readers with an undergraduate level understanding of literary criticism, and some of it is of interest to those steeped in both critical theory and Pynchon lore. *Pynchon* has already been used to gather information for advice on and approaches to the teaching of Thomas Pynchon to be used for both a course which that member was teaching as well as an article on the teaching of Thomas Pynchon that he was preparing; for discussions of Pynchon's literary technique and ideological and other content; for dissemination of information concerning articles and reviews; and for sharing of Pynchon trivia and apocrypha. A printed medium would be unlikely to serve such diverse functions.

The sixth forum is *MBU-L*, also referred to as MegaByte University. Selected messages are also compiled and e-mailed in *Computers and Composition Digest*. moderated by Robert Royar <R0MILL01@ULKYVX>. This forum is primarily dedicated to discussing computer applications and composition instruction which includes such things as composition theory and practice generally, computer communications and e-mail, and the political and social implications of computer use in education. The discussions vary widely in formality from very informal, light-hearted exchanges principally between individuals through requests for research information and sources, to much more formal theoretical discussions. As of 31 December 1990, Volume 5 Issue: 37, *Computers and Composition Digest* had a circulation of 133 individuals at 22 sites.

The *MBU-L* list is owned by Fred Kemp <YKFOK@TTACS> and the traffic contains daily discussions among people who are in the forefront of the field of computer use in English studies generally and American rhetoric and composition theory in particular.¹

The seventh forum is *Arachnet*. The notice I initially received concerning the forum referred to it as "A Loose Association of Electronic Discussion Groups for Scholars in the Humanities and Social Sciences", and explained its purpose as follows:

The number of ListServ and other discussion groups devoted to the humanities and social sciences is growing rapidly. As more scholars come on-line, the size of these groups, the diversity of material they have to offer, and their total number are all bound to increase. Arachnet has been established to provide a loose confederation and common forum for the editors of these groups so that they may share experience and resources easily without having to accept any kind of restriction on their manner of operation. As an editor, moderator, or owner of such a discussion group, you are invited to join Arachnet.

Technically Arachnet is an ordinary ListServ list, Arachnet @ VM.EPAS.UToronto.CA, running on an IBM mainframe at the University of Toronto (Canada). Since the group is quite new, we have no definite programme, but the editors offer its facilities for largely non-technical discussion, e.g. of editorial policies and techniques or issues of design. In addition, the editors plan to use Arachnet's file-server to contain a comprehensive and detailed directory of its member groups, which for each will list a description of the group, its characteristics, and lists of files it holds. Other ideas are welcome. (Conner Dec. 13 1990)

This list is a special-interest list with membership restricted to members of a specific community, the community of editors or controllers of lists and forums. That the list is designed "to provide a loose confederation and common forum for the editors of these groups so that they may share experience and resources easily without having to accept any kind of

¹ There is a certain amount of confidentiality involved in the conditions of membership in *MBU-L* which precludes my revealing the members of the list without permission from the individuals involved. While it is not an impossible task to post a message to the list and request such permission of the members, it is impractical.

restriction on their manner of operation” contrasts with the image many still have of the computer as a “big brother” device for control or manipulation of society. The group having no definite programme, but the editors suggesting discussion “of editorial policies and techniques or issues of design” underlines the new and evolving nature of electronic communications. This notice also suggests that the difference in nature between electronic forums and discussion groups on the one hand and more traditional print-mediated group interchanges may result in different policies, designs, and issues. *Arachnet* is coedited by Willard McCarty and Patrick Conner at the University of Toronto.

Electronic forums and electronic mail also make it easy to establish associations and collaborations which would be less convenient to establish and as a result less likely to become established. For example, in November 1989 I received information from Stuart Moulthrop at Yale concerning the publication of a new novel by Thomas Pynchon. I had contacted Stuart about other Pynchon-related material which he had notified *Humanist* about. In his response, he passed to me information that Harold Bloom had gotten directly from Pynchon and related to Stuart Moulthrop. On *Humanist* and other electronic forums it is generally the convention that in responding to something on the forum one sends the response to the list for dissemination to the membership as a whole if it is of interest or appropriate for the membership as a whole or one sends it directly to the author of the query if it is not deemed to be interesting or appropriate for the whole.¹ Intense

¹ The Ayatollah Khomeini's decree of a death sentence on Salman Rushdie for his novel *Satanic Verses* generated a good deal of traffic on the *Humanist* network and on other networks as well. In some cases the traffic was allowed to continue because it was of interest to the group as a whole. However the then editor of *Humanist*, Willard McCarty, decided to censor direct

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one-to-one correspondences are often spun off from forum communications.

Electronic forums and e-mail not only increase the efficiency of communication in general but reduce the impact that differences in position in the academic hierarchy have on communication. While some correspondents sign their communications indicating their position or status many do not.¹ With "marks of rank" being less evident, responses to queries or statements on various forums tend to be appropriate in their sophistication to the sophistication of queries or statements rather than being tailored to what the individual responding thinks is appropriate for the author of the message given her academic status. I speculate that this freedom from rank-dependent rhetoric is also encouraged by the fact that even if rank is evident, the anonymity of distance greatly reduces the immediate political importance of the rank. No matter how egalitarian we academics pretend or try to be, differences in academic position do effect both our willingness to communicate with each other and our expectations concerning the value and sort of information we might receive from each other. Forums organized by discipline and topic(s) and electronic mail go a long way towards putting more emphasis on evaluation of the content of a communication and reducing value judgements related to academic status. This is not to say that academic status is not relevant. That the information I received came from a conversation between someone of the status of Harold Bloom and Pynchon himself increases my faith in its accuracy.² A

discussion of the affair while allowing discussion of his act of censorship.

¹ Where this sort of signature occurs it is most often of the form, Jane Doe, Professor of English, X University, Location X, the purpose seeming to be to communicate academic institutional affiliation. It much less frequently takes the form, Jane Doe Phd., Dr. Jane Doe, or even includes degree status.

² I acknowledge, however, that there is reason to believe that Pynchon has a tendency to
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large part of the point here is that as a Master's student I would be very unlikely to be in possession of the given information which is of great value to me without the speed, coverage, and political leveling influence of electronic communications.¹ John Quarterman argues that computer mediated communications (CMC) are useful for bypassing hierarchies, while acknowledging that this aspect of CMC may be a problem in certain circumstances:

One reason for the popularity of CMC is that it can be used to reach people directly without going through established bureaucratic hierarchies. This is a source of concern to some people. Some well-known computer scientists do not have electronic mail addresses because they do not want junk mail. Business executives don't want hierarchies bypassed in their companies because they like the way they are set up. Executives worry that electronic mail systems will be used for nonbusiness purposes or to reach people who would not otherwise be available. In fact, most business computer systems are used for business, just as most business telephones are. Executives who worry about frivolous use of computer communication systems probably don't understand their potential value in company morale.

Eventually, most CMC may be controlled by governments, just as telephones are in most countries of the world today. Whether that would mean less anarchistic access by computer remains to be seen. (Quarterman 40)

Virtual Classrooms

Rapid electronic communications also allow for the creation of *virtual classrooms*. A virtual classroom is created by software rather than boards, bricks and reinforced concrete, and is defined by common interests and goals rather than a set of space/time coordinates. Communications in a virtual classroom are asynchronous, meaning that they are spread out in time. This has the advantage that a class member can sign on and

equivocate.

¹ For further discussion of social or political leveling issues of electronic communications see D. Langston & T. Batson, "The social shifts invited by working collaboratively on computer networks: The ENFI Project" in C.V. Handa (Ed.), *Computers and community* (pp. 140-159); and Marilyn M. Cooper and Cynthia L. Selfe "Computer Conferences and Learning: Authority, Resistance, and Internally Persuasive Discourse", *College English* 52 (1990): 847-869.

participate when it is convenient for her to do so. This way a student's learning is much less constrained by space and time; a student is not prevented from joining a class because of scheduling conflicts or the need to hold down a job while going to school. Another advantage of asynchronous communications is that the student or instructor has time to more carefully think out and structure her queries and responses than she would with the need to reply immediately as in a classroom setting. A few moments and/or the time to retrieve a reference can make for a much more useful communication. Taking this time with spoken communication in a classroom discussion can lead to a student interjecting a comment which is now much less relevant to a conversation that has moved on. Also, where in a physical classroom setting it is difficult to carry on several profitable discussions at one time even with several different sets of participants, let alone the same specific subgroup of participants, with a class communicating asynchronously via computer several discussions can easily run concurrently. And with a written record of the discussion it is much easier to keep track of the discussion and refer more specifically to previous statements.

Electronic communications in a virtual classroom also allow for collaborative teaching and multi-institutional degrees (Hiltz, Shapiro, Ringsted 37). As students need not be in the same place or at the same time, neither do instructors. Courses can be offered that benefit from the special skills of several instructors who cannot be at the same location or who otherwise could not give a class benefit of their combined skills. Similarly, graduate courses and programs which require specialists from different universities are now easy to offer (Hiltz, Shapiro, Ringsted 49-50).

Among the obvious advantages of a virtual classroom over traditional

distance education by snail (surface) mail are speed of communications between the students and instructor and speed and frequency of communications among the students. Such rapid, frequent, and convenient communications overcome problems of lack of interaction and lack of interconnection associated with traditional distance education. Another advantage, a very practical one, is that while almost all other kinds of communication cost the user money, academic computer communication is typically free to the user. Why it is so widely available free of charge to those at academic institutions is not immediately apparent.

E-mail can easily and inexpensively maintain communications unlikely with other technologies. For example, it can maintain connections between a conference and anyone else who cannot be there physically. At the 1989 *Inkshed*¹ conference, *Inkshed VI: Power, Politics, and Pedagogy*, copies of the papers and daily synopses of the proceedings were sent to Russ Hunt² in England and he returned contributions and comments for dissemination to the group. He received these communications in time to make responses that contributed and were of value to the group. He and members physically present at the conference reported that the e-mail link did allow for a significant feeling of connectedness between him and the group at the conference as well as accomplishing the fact of communication and conference interaction between them. Such contact could not be maintained by traditional print-mediated or postal service technologies

¹ *Inkshed* is the newsletter of the Canadian Association for the Study of Writing and Reading.

² Russ Hunt was a usual attendee at *Inkshed* conferences whose presence was missed. The conference organizers wished to try e-mail as a means retaining some of his presence at this particular conference.

because of the time involved and would be unlikely to be maintained by telephone because of expense and the nature of oral communications.¹

Another increasingly common use of e-mail is for electronic journals such as *Offline* and *Postmodern Culture*. *Offline* is edited and distributed by Robert A. Kraft of the University of Pennsylvania and deals with such Humanities computing issues as “the need for reliable information, for accessible electronic texts and data with which to work, for easy transfer capabilities to permit individuals to work independently on their own microcomputers, and for appropriate multilingual display systems for screen and printer” (*Offline* 22). *Postmodern Culture*, as the name suggests, is dedicated to the discussion of issues relating to postmodernism and is edited by Eyal Amiran of the English Department of North Carolina State.

An electronic journal has a much, much shorter turnaround time than a printed journal, allowing scholars to keep that much closer to the cutting edge of English studies research. Edward M. Jennings (EMJ69@ALBANYVMS.bitnet) and Allison B. Goldberg (AG6742@ALBANYVMS.bitnet) from the department of English at the State University of New York, Albany, have transmitted via the e-mail mailing list *Literary* the following suggestion for “a refereed electronic journal for discussing relationships among electronic media and ‘texts’ of all sorts.” From this quotation, you can see some of the issues that face the new medium and also the specific topics the particular journal might discuss.

¹ There are now emerging technologies of teleconferencing which combine transmission of voice, video, text, and graphics. They are not yet practical in part because they depend on further hardware and software advances. In any event they offer much more than simple oral communications.

Electronic texts in the humanities are not yet generally considered academic "publications." They are not likely to be taken seriously in the course of deliberations about tenure and promotion. This can be attributed, in part, to a latent, unchallenged premise—a default assumption—that ideas aren't quite real until they have been printed and bound and received in the mail. Another factor may be the reputation for informality that computer networks have usually sought, and gained. Perhaps most restraining, though, is awareness of how pushy it would be to put forward "ideas" whose merit remained unacknowledged by one's peers.

But an edited and refereed "paperless" journal, one devoted to electronic texts and the implications of the medium, would stand a good chance of acquiring legitimacy even if (and perhaps because) it appeared principally on-line. What's more, network communications ought to permit speedy exchange of submitted texts; reading, critiquing, revising and distributing ought to happen faster than with paperbound media. We are proposing such a project.

Here are a few of the subjects we imagine might be discussed on the screens of a forum called *BIT.TXT* or *NET.TXT*. Please imagine each of these "headings" and listed items intersecting with other items and headings to generate other subjects.

MEDIA: digitized information: visual, audial, alphanumeric; disks, CDs, networks; micros and minis and mainframes (including parallel processors, neural networks); hypertext, relational databases, spread sheets

GENRES: essays, fiction (interactive, aleatoric...), drama, ethnography, criticism, memoranda, committee writing, satire

SUBJECTS: education (distance learning, collaboration ...); cultural evolution; intellectual history; futurology; semiotic and information theory; technology and literature and theory and criticism; index/filter/categorization/abstraction approaches to overloads of information

PROFESSION/DISCIPLINE: role of journals; marginalizing of technophiles; pedagogy; psycho/socio/eco implications of it all ...

We are looking for people interested in participating in all parts of such a project, as possible contributors, referees, or subscribers (who would receive announcements of "articles" that have been reviewed and are available for distribution). (26 Oct. 1989)

Contemporary information technologies could have a profound impact on the traditional notion of the academic 'grand tour' necessary for a complete education. It is less necessary to go to a major research library or a great scholar for enlightenment; much more information can now come to us at the "virtual information environment" of our work-stations. Rather than have to go to a different university to complete a further degree because of the specialists in a given area at that university, a graduate student could have daily e-mail exchanges with given professors as easily and perhaps more easily than if the student had to find the professor for a face-to-face discussion. It is possible, indeed likely, that a specialist in a popular area would be swamped with e-mail; but this problem is easily overcome by

setting filters with the e-mail software that would filter out all messages except those in categories defined by the user. It need not be the case that those messages filtered out are simply refused or destroyed. The user could set various folders or categories into which the software would sort messages allowing the user to tackle messages in order of importance.¹

Although this sort of e-mail arrangement between a grad student and a professor/specialist in a given area might on the surface sound somewhat informal, that certainly need not be the case. The student and professor need not let physical distance affect the formality of their relationship. The main difference, likely to be seen by some as a disadvantage, between an e-mail arrangement and the student actually being physically resident at the specialist's home university would be the less frequent face-to-face contact between the two. An advantage to the e-mail arrangement would be that all communication between student and professor could be filed for future reference by either, thereby saving a good deal of the sort of wasted time often spent getting confirmations of spoken information, references to sources, etc. Also, given the rapidly increasing availability of machine-readable texts and the fact that virtually all serious academic work is now being produced by word processors and so is in machine-readable, such academic work is thus—potentially, at least—easily transmittable electronically, further decreasing the turn-around time for exchange of data. For example using e-mail and electronic file transfer, a student could get a

¹ A similar sort of call screening is coming into common practice where people with answering machines are using them to screen calls even when they are available to answer the phone. Telephones can also now display the number of the caller on a screen so that you can answer calls from a given number or not. Calls are often answered or returned according to a priority of importance. See also the discussion of information agents elsewhere in this dissertation.

professor's latest paper more quickly from across a continent or half-way across the world than they could across the city without e-mail.

It might be argued that the supposedly impersonal nature of electronic text communication inhibits the development of the sort of collegial environment that fosters intellectual or academic ferment. It is true that where such a collegial atmosphere exists it greatly helps intellectual or academic endeavour; but e-mail and conferencing are not impersonal in the sense that they inhibit the development of a collegiate environment. Rather, e-mail communications greatly increases the feeling of the size of the academic community one has access to and number of individuals in the immediate academic environment. To some extent the feeling of collegiality that exists between e-mail users is probably due to the fact that they are bound together by the use of the new technology as well as the subject matter they are communicating about. They may be members of the community of teachers or scholars of composition as well as members of the community of users of e-mail.¹

Information Agents

Given that e-mail can also be used for automated linkup and communications with textual databases, there is the potential for receiving an enormous amount of text. One way of dealing with the potentially

¹ In this example I am thinking particularly about *MBU-L*. They go beyond a feeling of collegiality all the way to a feeling of family membership. At the risk of sounding nonacademic, I must say that there is a feeling of warmth and familiarity among many of the interchanges, even the conflicts, which I have not experienced or heard of in any other large group interchange.

overwhelming amount of textual and other material generated by both the availability of machine-readable texts and electronic mail is through the use of *information agents*. An information agent is a software-based entity that can be programmed to check for information according to criteria set by the user. The information agent can be activated manually, that is activated by the user to perform once each single time the user wants a check made or activated to work automatically and report back to the user via e-mail or through entries into a file.¹ In "From Electronic Books to Electronic Libraries: Revisiting 'Reading and Writing the Electronic Book'", Nicole Yankelovich explains information agents as follows:

Full-text searching is crucial, but in a large, ever-changing information environment, full-text retrieval alone is not enough. People need some mechanism for keeping abreast of new and modified information. For example, a graduate student investigating motifs of wandering in works by American or British women writers should not have to issue a query every day to discover if any new writings have been added to the Women Writers collection. Instead, it would be much more time-efficient for the student to ask an information assistant or agent to run the query once a day and report back whenever relevant additions appeared in the collection. Likewise, an information agent might keep collaborators aware of each other's activities. For example, researchers who collectively work on the Women Writers Project need to know what documents or links have been created or updated since their last session and by whom.

A number of researchers have done interesting work in the area of agents.² Most of this

¹ We can now have our own electronic "Bunter" in this restricted domain. As noted by Delany in "Hypertext, Hypermedia and Literary Studies: the State of the Art" (49) "[i]n Chapter 5 of Dorothy L. Sayers' *Whose Body?* Bunter performs a similar service for Lord Peter Wimsey, scanning the morning newspapers and marking passages relevant to Wimsey's current case."

² C. Kamila Robertson, Donald L. McCracken, and Alan Newell, "The ZOG Approach to Man-Machine Communication," *International Journal of Man-Machine Studies* 14 (1981): 461-488; Donald L. McCracken and Robert M. Akscyn, "Experience with the ZOG Human-Computer Interface System," *International Journal of Man-Machine Studies* 21 (1984): 293-310; W. Bruce Croft and L. S. Lefkowitz, "Task Support in an Office System," *Transactions on Office Information Systems* 2 (1984): 197-212; A. R. Kaye and G. M. Karam, "Cooperating Knowledge-based Assistants for the Office," *Transactions on Office Information Systems* 5 (1987): 297-326; K. Crowston and T. W. Malone, "Computational Agents to Support Cooperative Work," *Technical Report WP 2008-88*, Sloan School of Management, MIT, Cambridge, MA, 1988; R. E. Kahn and V. G. Cerf, "The World of Knowbots," Draft report, Corporation for National Research Initiatives, 1988; and K. Lai, T. W. Malone and K. Yu, "Object Lens: A
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work, however, requires that users specify a set of rules governing the behaviour of agents. Another approach, which we find preferable, involves designing agents that operate in conjunction with interactive applications with which users are already familiar. In the case of the graduate student looking for wandering motifs, he or she could use an application such as our Document Search tool to search for occurrences of "wander, ramble, stray, excursion, recluse, vagrant." As usual, the application would provide a list of documents ranked according to their probable relevance to the search request. If the result list proves interesting, the student would then *register* the query with the information agent, specifying how often it should be run and how the results should be communicated. When new results became available, the agent would generate electronic mail indicating that new material has been located, or the agent might generate a FAX with the actual list of documents. To review the new material most effectively, the student will probably want to interact with the results in their "native" environment, in this case the Document Search application. (Yankelovich 136-137)

Although it may be a long time, if ever, before computers can function with anywhere near the flexibility or ability to recognize serendipity that humans are capable of, the potential of such an information agent to expand the resources available to a scholar could be matched only by human assistants that are beyond the reach of most scholars.

Primary Texts

The primary-texts node will index documents in a variety of ways: chronologically, by author, by genre (e.g. novels), and by category (e.g. subject "webs"). The destinations available from this node will be represented as literary time-periods, the next level destination being a time frame, e.g., the eighteenth century. Included will be an alternate button which will bring up a list of all of the specific authors and texts available on the computer system. These texts will, of course, be in machine-readable form allowing the user to search the texts for words, phrases, concepts, etc. The texts will be searchable either individually or in varying combinations up

'Spreadsheet' for Cooperative Work," *Transactions on Office Information Systems* 6 (1988): 332-353.

to and including all those available.¹

Each chronological-period node will then branch to the individual authors of that period. Each individual author included will show links to a “web” which will be a hypermedia-linked and organized compilation of some or all of the following resources:

- the author’s texts
- biographical material, a textual and graphical (where available) selection
- bibliographical material, a selected list of bibliographic references for some of the main secondary works dealing with the author’s life, body of work, individual works, etc.
- a selection of relevant secondary material such as literary criticism or literary background, or discussions of connections to other literary, artistic, scientific, social, or philosophical works, schools, or movements
- graphic material associated with the author and his works such as Hogarth’s drawings for *Tristram Shandy* or graphic works inspiring or inspired by a given work
- video resources such as Shakespeare’s plays, a movie version of *Tom Jones*, or animations of the main action or individual scenes in literary works
- audio resources such as readings of literary works or music associated with a work, author, or time period

¹ See the discussion of computer-assisted textual analysis in “Chapter III. Machine-Readable Text and Computer-Assisted Text Management.”

Unfortunately, the technology is not yet available for computer simulations of the smell of Shakespeare's or Dickens' London or the physical sensations of Smollett's *Roderick Random*. The English National Opera's production of Prokofiev's "The Love of Three Oranges" with scratch and sniff patches on the back of the seats was at least a step in the direction of providing increased sensory experience for the appreciation of art.

Some of the individual-author subunits may resemble the hypermedia unit for *Joseph Andrews* (Delany and Gilbert 287-298). *Joseph Andrews* was originally designed as a largely self-contained unit rather than as a grouping of nodes in a much larger system, so the main differences between it and a primary-text node in the English Scholar's Workstation would involve the movement of some functions such as some communications, database, and secondary-source data closer to the entry point.

An individual-author subunit in the *Context 32* section of *Intermedia* such as the Dickens unit (see Figure 1) is somewhat similar to that proposed for an individual-author subunit in the ESW. The ESW will have links to biographical and bibliographical data and the author's individual texts. In *Context 32* the user is shown all the documents linked to the "Dickens Overview," such as those concerned with Dickens' literary relations (Landow 87-89). The Dickens section of *Context 32* has been released as a commercial product, *The Dickens Web*:

The Dickens Web is a sample IRIS Intermedia web, a conceptually linked collection of materials pertaining to Charles Dickens, his novel *Great Expectations*, and many related subjects such as Victorian history, public health issues, and religion. With the *Dickens Web* you can examine hundreds of documents about this author and his world, following connections between timelines of Dickens's life, biographical essays, contemporary illustrations from his novels, and essays about his influence on other writers. (IRIS 1)

In the near future we will have access to a very large corpus of English literature in machine-readable form. We might have our own copies in a department or university library, or we might be able to access them via an information service. With an electronically searchable corpus of literature and future increases in speed and memory capacity of hardware we might search, in a very short period of time, any given portion or all of it for a phrase, an approximation of a phrase, a group of words, two or more words occurring within an arbitrarily specified limit of words, just a single word, or a word root. For example, given a discourse analysis problem with a defineable set of parameters, a scholar could search all extant texts from American prose fiction writers from 1850 to 1900 for a particular sort of grammatical construction and then examine the grammatical constructions for significant distinguishing factors in relation to potentially significant differential variables, such as sex, between the authors.

Via communications networks, a greater number of literary scholars could have access to each other's work and to new secondary texts in a much shorter time than is now practical with present publication and communications practices.

Machine-readable texts themselves are rapidly becoming available. Within the next five years most major English texts not currently encumbered by copyright should be available in machine-readable form. One very important electronic text is of course the OED.

The...New Oxford English Dictionary, issued in paper in 1989, now is matched by the one-gigabyte electronic edition of text plus index, a constantly maintained database that can be searched very rapidly with software designed at and now marketed from the University of Waterloo OED centre by Open Text Software. The software is actually two interdependent programs, PAT and LECTOR, which together allow people with powerful PCs employing the UNIX and other operating systems to search and display information such as Shakespeare's use of the word "nature", in context, with definitions and cross-references provided. (Flannagan 1990)

The *OED 2* is also planned for release in CD ROM version for late 1991 or early 1992. Other electronic text projects include the planned British National Corpus, "which will be an enormous database, over 100 million words, of contemporary British usage, a cooperation between OUP [Oxford University Press] and Longmans, the University of Lancaster and the British Library" (Flannagan 1990) and the "International Corpus of English" project coordinated by Sidney Greenbaum, University College London. (Johansson 1990). Two central locations for obtaining electronic versions of literary texts are the Oxford Text Archives at Oxford University and the Centre for Computer Analysis of Texts (CCAT) at the University of Pennsylvania. *Humanist* and other e-mail groups also carry frequent requests for and offers of individual machine-readable texts that have been input either manually or via scanner and OCR software.

That such effort is being put into providing machine-readable texts by such prestigious institutions, is further evidence that computer-assisted textual analysis is going to become a standard procedure in English studies. If that does become the case, a scholar of English who does not have the necessary skills to participate is not going to be able to carry out the same sort of analysis. That scholar will then to some extent lack competence or literacy skills in the field of English scholarship.

Analysis, Search

The analysis and search node will contain software for analysing machine-readable texts, not just primary works but a scholar's own essays. Here there may be considerable overlap between analysis and composition

assistance. At the most mundane, but nonetheless important, level, whether it be with primary or secondary text or one's own work, the ability to search a text for a quotation or another particular piece of text can save a lot of time and frustration.¹ On a more sophisticated level, software like *Gofer* and *Sonar* can do complex Boolean searches for words or phrases on a number of texts at a time. For example, with *Gofer* one could search for the occurrence of word or phrase *X* or word or phrase *Y* within one hundred and thirty-seven words of word or phrase *Z* through the entire works of Graham Greene and have the program save to disk the selections plus 20 lines either side.

Composition Instruction and Assistance

There are a number of different composition-instruction and composition-assistance programs in existence, based on mainframes, minicomputers, and different microcomputer systems. Their usefulness is widely variable, partly because composition instruction is multi- or perhaps even preparadigmatic. A composition-instruction or composition-assistance program may fit very well with one instructor's pedagogy or methodology and be seen as the spawn of Satan by another.

This type of software runs from simple spell checkers through some highly questionable grammar and usage checkers that, at their worst, incorrectly or over simply apply rules that are not universally agreed upon

¹ The availability of *The Oxford Dictionary of Quotations* in digital form on the NeXT computer may well increase the general aura of erudition of many documents composed thereon.

across or even within genres, to some useful computer-assisted composition-instruction programs such as PROSE for the Macintosh and IBM systems. Even capabilities that are not specifically designed for composition assistance can prove useful, such as the voice-messaging capabilities of the NeXT. *PROSE*, Prompted Revision of Student Essays, allows instructors to embed comments in word-processed, electronic copies of student essays. The student provides the instructor with both a printed copy of her essay and an electronic copy on disk or via the network. The instructor then opens the electronic copy of the student's essay with the instructor module of *PROSE*, and embeds appropriate comments in the essay. The comments are of several types, including prewritten comments that are linked to grammatical exercises for common sorts of errors. Given a word-processor file, an instructor could add in anything she wanted. The comments would then be a part of the text of the file (as in "student's text instructor's comments student's text"). This method quickly results in text that is difficult to read and edit. With *PROSE*, the passages of text that are commented on are delimited by markers (such as "►01" for comment number one). The student then retrieves her essay, views the comments—by, in the case of a Macintosh computer, clicking on the marker, opening a window containing the comment—and responds appropriately, perhaps submitting a rewrite. She may delete the comment. On the NeXT computer, voice messaging can be used to embed icons in a student's word-processed document which, when activated, play stored voice comments from the instructor. Student responses to the use of this voice technology in English composition at Allegheny College indicated that the students felt the voice commentaries were more helpful and personal than written comments. This student perception alone, aside from its objective truth

status, is likely to have a positive effect on the students' learning. (*NeXT on Campus*, Summer 1990)

These composition assistance and instruction capabilities could easily be built in to a module for the ESU, which could also serve as a stand-alone unit. In terms of its academic content, though, it could be much broader in scope. Dr. J Giltrow, an instructor in composition and literature at Simon Fraser University, and I are now in the planning stages of a HyperCard-based composition-instruction workbook as a potential adjunct to composition courses at Simon Fraser University's. This application is similar in some respects to a combination of *PROSE* on the Macintosh and the voice messaging capabilities of the NeXT. The application may either be based upon or work in conjunction with Dr. Giltrow's text *Academic Writing: How to Read and Write Scholarly Prose*. It would contain hypermedially-linked writing exercises, examples, and explanations. The students would be able to compose their essays directly on screen within text fields. Given that at some stage some of the students may want printed copies of their essays to edit manually, the application would contain clickable, screen button-based report generators for printing. The instructor would be able to take a student's HyperCard stack and insert into the essay on the card both voice and text comments that can be linked to appropriate exercises, examples, or explanations. Among the advantages of voice comments is that they can more quickly give extensive instruction than can be given in writing. And both voice comments and comments in a text field separate from the field containing the student's essay can be much more extensive and detailed than those in the limited space of the margins and between the lines of a student's printed essay. One obvious advantage to both voice and electronic text comments is that they are not obscured by hasty and perhaps even

scrawled handwriting. The greater the student's ease in deciphering the instructor's comments, the greater the chance of her attempting to respond appropriately to the comments and learn as a result. A rough working core of the application has already been scripted and the remainder of the programming side of the project is relatively simple.

Another approach to using computers to assist the teaching of writing is being taken in such projects as the ENFI (Electronic Networks for Interaction) project. Classes meet in computer-networked classrooms and do much of their communicating by typing via computer. Aside from the obvious advantage to hearing-impaired students, studies indicate that this type of communication results in greater retention of material over oral communication (Batson 1988 1991, Fowles 1990).

Data Bases

A computer database is not only an efficient way to organize research material and make it available for others' use, but it is as well as a useful administrative tool. Dr. Carole Gerson, an instructor and researcher at Simon Fraser University, is working on a woman writers biographical project. Her database plan for the project is a good example of database use for English studies. She will be compiling detailed biographical, bibliographical, and geographical data on woman writers and entering it into a computer database. (See Appendix for Dr. Gerson's database plan.) Dr. Gerson is at this moment of writing further designing the database and defining the fields in anticipation of the reports¹ to be generated from it.

¹ A database is a file or group of files containing information organized in categories. The
footnote continued >

The following is part of Dr Gerson's explanation of the purpose and expected use of this database:

One of the most important reports will in fact be a published biographical reference guide on early Canadian women writers (i.e. a book). ...

I will be using the women writers database to discover and describe some of the biographical patterns consistent with literary activity (defined as the production of books of fiction and poetry) among English-speaking Canadian women before 1940. The database will help me determine some of the following: The relationship between marriage and literary activity; between motherhood and literary activity (writers seem to have been disproportionately childless compared to the general population); between religious affiliation and literary activity; between literary activity and social class (defined by fathers' and husbands' occupations). I will be able to distinguish between Canadian-born and foreign-born authors, and to determine which writers come from literary families. I also wish to discern links between women writers (who was friends with whom), connections between writing and other artistic activity (many creative writers seem to have been musicians, for example), and the significance of membership in professional organizations (principally the Canadian Women's Press Club and the Canadian Author's Association). Of particular interest are the other work and careers of literary women: as teachers, nurses, librarians, farmers, ministers' wives, etc. It will also be possible to sort authors by genre, audience (e.g. those who wrote for children), publisher, and place of publication (e.g. who published in the U.S. and why).

Once all this material is databased, it will be available to researchers in any area. While I see it being useful to librarians and archivists, and to those working in Canadian history, literature, and sociology, it is hard to anticipate all potential users. Someone working on Canadian women's history will be able to acquire data on a particular group such as middle-class immigrants, or ministers' wives, or teachers, or residents of Toronto, for example. The information on education (schools, universities, and degrees) will assist a researcher working on a particular institution. It will be possible to trace members of the Canadian Women's Press Club or the Unitarian Church. Or a local history project will be able to find many people who lived in a certain city, or were born there or died there. Genealogical researchers will find information on particular individuals. And those working on the literary history of Canada will have access to details of publishing history, such as the activity of a particular press, and to basic reference materials on a particular author. An important feature will be the compiling of references to archival records on each author; this will serve a variety of researchers in many fields. (Gerson 1990)

Where Dr. Gerson's database will contain mainly primary data, another sort of database which contains data which directs one to other data is the *MLA Bibliography* with which we are all familiar as a hard-copy publication

categories of information, such as "address", are defined in terms of one or more fields or containers of information. For example the address can be composed of the subcategories such as street address, town, province, country, and postal code. A given database can automatically select predefined portions of its data and combine them with predefined text and/or graphics (with some databases such as those easily createable with HyperCard, audio or video data could also be combined) to generate a number of different reports.

and which now is available in CD (compact disk) data format with quarterly updates and/or as a dial-in service. The *MLA Bibliography* has been available as a dial-in database for some years, saving enormous time as compared to poring over the great paper-based tomes.¹ If one is looking for works on a given subject it is much more time-efficient to let a computer do it at electronic speeds and then let the human mind work on the results with the intuitive and analogic sorts of reasoning that the computer may never be able to approach. It is also easier to keep an on-line service and CD up to date. If deemed appropriate, an on-line service can be updated constantly on a minute-to-minute basis. CDs are also much cheaper to produce than books of the sort of the *MLA Bibliography*, so they are likely to be updated more frequently and have a wider distribution among smaller institutions. And, like other electronic databases, the *MLA Bibliography* can be installed on a network and accessed from diverse locations within such a small time period that it appears to be serving multiple users at the same time.

Individual department profiles can also be stored in an electronic database and used for the usual purposes, only more rapidly. Such a database with frequently updated individual specialties or interests (long or short-term and updated accordingly) could also be linked to electronic forums, lists, or news services for electronic sifting in order to provide the user with a greater range of data than she would otherwise have access to. Such data would also be presented more conveniently for inclusion into various documents than if in a paper-based format, so it would much more likely get used.

¹ Not that I do not appreciate tomes. There is little more magical than a great tome, especially if it is bound in leather. The problem is that poring over tomes is time consuming and occasionally hard on the wrists.

Presentation

The most ubiquitous mode of formal presentation for the English scholar is the written essay. In terms of contemporary information technology this means word processing. Although the essay and word processing will probably remain the mainstay for the foreseeable future, it is not the only new computer-based technology available to assist English scholars in presenting material to fellow students and faculty. We now also have access to simple-to-use yet sophisticated-in-function static and animated graphics software; desktop publishing software for blending graphic and textual data in essays, pamphlets, or books; desktop presentation software for screen presentations involving text, static and animated graphics, audio, and video data; and outlining or, as it is often referred to, thought processing software. With such resources, a scholar/student could produce a hypermedia-based presentation on a work of drama, for example, with built in links to selections from a video of a production of the work. Similar things could be done with audio resources for a reading of poetry or a movie rendition of a prose work.

Personalized Data and Enquiry

This node is to some extent a convenience feature. It will lead directly to a scholar's various types of documents and database files. This node is in this close position so that a user will not have to travel first to a node representing a particular function, e.g., word processing, databases, OCR, to open word-processing or database files that represent an in-process or

completed document or project. This node will also allow for convenient, individually-meaningful or idiosyncratic organization of a scholar's own documents as well as convenient access to them by having them grouped in a single location¹ or linked hypertextually.

Intermedia/Context 32

This next node will link to some of the Context 32 material from Brown University as described above.

Scanning and Optical Character Recognition

The Scanning and Optical Character Recognition node will lead to facilities for scanning graphic and textual data for inclusion in a scholar's work or for analysis. Optical character recognition (OCR) software translates scanned graphic images of text into machine-readable documents which can then be word-processed or analysed by computer. Scanning and OCR is one way of producing machine readable texts. Given a clean copy to be scanned, this method is much quicker and generally more accurate than typing the material. With the addition of document comparison software, several editions of a work can be compared electronically for differences in wording

¹ Here again we run into a problem of spatial metaphors. The actual physical location of the files is not very relevant. What is relevant is the apparent location in terms of the organizational metaphor used and also how quickly a scholar can get files open and get from one to another.

and punctuation. (See section on machine-readable texts and electronic text analysis.)

ChapterV. Conclusion: Building a Computerised Work Environment

A computerized work environment might be likened to a kitchen and its set of implements and ingredients or a workshop and its contents. A kitchen has its recipe books, the cook's notes, basic raw ingredients, spices, as well as measuring, mixing, and cooking implements. The cook with his knowledge and previous experience of cooking takes all these resources and uses them to create a dish. A worker in wood might take her manuals and patterns, some maple, a saw, chisels, a lathe, glue, and screws and create a chair. Similarly, a scholar would use the English Scholar's Workstation to research, analyse, produce texts, and prepare lectures. But, just as as cooks and woodworkers differ in skill and commitment, so will scholars vary in their exploitation of the battery of electronic tools that are now at their disposal. I will describe how a scholar with relatively high involvement in computing might go about a typical piece of work in the near future; and then conclude with suggestions about more advanced techniques that may become available in the medium-term, within a five- to six-year horizon.

A view of a scholar's activities with the ESW might go like this. The project could be to produce a conference paper and article on Angela Carter. From *Humanist* or a more area-specific electronic list she learns of a conference on British women novelists; using e-mail she registers for the conference, sends in an abstract, and discusses it with the conference organisers. She assembles preliminary materials from a file in the Personalized Data and Enquiry node that she has already started. Next she might go to the Primary Texts node to examine a part of Angela Carter's *Heroes and Villains*, or she might use software in the Analysis and Search

node to look for occurrences of some particular word, phrase, or grammatical construction in *Heroes and Villains* or other works by Carter. Next, or even while a document is being compiled by the search software, she might go to the Database node to search the MLA bibliography for other articles on a particular aspect of Angela Carter or for critical work by Angela Carter herself. From the MLA bibliography's on-line catalogue or CD she assembles, by cut and paste, the list of references for her own article. She might also wish to use the Communications node to send an e-mail message to a distant colleague to discuss the paper she is working on or to ask for information relating to it. The information our scholar receives will be added to the paper she is word processing in the Presentation node. This or other word-processed documents might eventually become part of a book or journal edition that our scholar is preparing using desktop publishing software also via the Presentation node. Such a book or journal might also require the use of the Scanning and OCR node to scan in graphics or to scan hard-copy text and turn it into machine-readable text with OCR software. The completed article will be submitted on disk or sent via electronic file transfer to a journal.

In the medium term, some of the activities just described will be supplemented by artificial intelligence or expert systems that can track and learn a literary scholar's practices in order to analyse, improve, and/or assist them.¹ It is not at present, and may never be, possible for computers to perform more than a simplified simulation of some of the processes of the

¹ Expert systems are a form of Artificial Intelligence (AI) software that allow the knowledge of a domain expert to be saved and applied in computer form. AI is a collection of techniques that allow computers to simulate—in some degree—the human mind, human intelligence, or perhaps more specifically human reasoning processes (Frenzel 6). A domain expert is a person with strong knowledge of a particular subject area.

human mind. But AI techniques go a step beyond what most users presently require computers to do. Conventional computer software¹ processes data by applying to a problem or task an explicit step-by-step process, an *algorithm*, which leads to a solution or resolution. Given a functional program and the data and barring computer failure, the computer and software completes the task or solves the problem. But AI uses symbolic processing, rather than simple data-processing techniques, applying an inferencing engine to a knowledge base which contains facts and interrelations about a set of objects, actions, and processes. The inference engine takes external inputs such as statements about or definitions of a problem and then explores the knowledge base through a process of searching and pattern-matching, often with continuing input and refinement of the process by a human user(s). An initial search and match may then be reapplied to further searching and matching etc. to form a chain which simulates a reasoning process. The result(s), in a "restricted domain"² at least, can be functionally equivalent to the result provided by a human expert working on the same problem. Like a human mental process and unlike conventional data processing, an AI process may not be able to come up with a solution, a possibility which I find particularly endearing (Frenzel 6-10). Rather than just present information from a subject area, an

¹ Conventional that is in 1991. AI software may become very common on personal microcomputers in the near future and thus itself become conventional. AI development is moving rapidly, and workstations with the processing power, processing memory, and data storage capacity to implement AI are on the verge of being affordable by the average user.

² A restricted domain refers to a limited area of data and a limited set of manipulations of that data—for example, the rules for assessing income tax. At present computers cannot make the range of associations within the wide range of seemingly unrelated data that the human mind can.

expert system presents and simulates the techniques typically used in that area to make sense of and interrelate that knowledge. As well as expert systems AI techniques are used for such things as natural language processing (NLP), speech recognition, computer vision, robotics, computer assisted instruction (CAI) and computer assisted research.

An expert system within the ESW could be implemented with a HyperCard-based expert-system shell, HyperX, which uses XCMDs and HyperTalk scripting to provide HyperCard with expert systems functions (Evans).¹ Even without a built-in expert system, the ESW is designed to facilitate literary analysis not only by providing electronic access to information and communications but also by attempting to reflect in its structure a model of the processes a literary researcher goes through.

HyperCard can already track and display the path taken through a corpus by an operator. This tracking ability may provide insights into the empirical methods of literary scholars, as well as insights into the differences between the empirical methods of sophisticated and unsophisticated scholars. These insights might provide the basis for an ESW-based expert system. With these sorts of abilities and with insights into successful research strategies combined with a convenient control centre for analysis, communications, and text production, a sophisticated "computerized research and presentation assistant" is a viable objective for the mid-1990s.

The spread of such techniques within the community of scholars will be

¹ An XCMD is an external command for HyperCard (some other programs can use XCMDs as well) which uses a piece of code written in another computer language, such as C, Pascal, or assembly language, which extends HyperCard's capabilities. For more information see Goodman 1987 or Bond 1988. HyperTalk is the scripting language used by HyperCard. For more information see Goodman 1987.

promoted by the "demonstration effect" of seeing how successful and useful the techniques are in the hands of colleagues who are advanced users. Local area networks and department computer laboratories will help to make the techniques more visible; consultants who have skills both in computing and in humanities disciplines will raise the general level of computer literacy within workgroups. In consequence, that majority of scholars of English who have now embraced word processing and own their own computers will use those computers in more sophisticated ways as machine readable texts, English studies related data resources, textual analysis software, and electronic communications networks and special-interest discussion groups become more available and accessible. It will become for most scholars in most cases easier, more effective, and more efficient to use computer-based resources and facilities than to rely primarily on earlier technology. It follows then that familiarity with and skill in using computer-mediated resources will become part of the basic competence or basic literacy that an English scholar will be expected to have. That basic computer skill or literacy will likely be a perhaps small but none-the-less necessary part of the membership criteria of the community of scholars of English and on a larger scale part of the membership criteria of the community of scholars as a whole.

Appendices

Appendix A

Find for "pall" from *Moby Dick*

What: pall¹

File: Jody's 20:Texts:melville.mob

Lines: 889 - 899 brothers. He might take a fancy to mine--heavens® look at that tomahawk. But there was no time for shuddering, for now the savage went about something that completely fascinated my attention, and convinced me that he must indeed be a heathen. Going to his heavy grego, or wrapall, or dreadnaught, which he had previously hung on a chair, he fumbled in the pockets, and produced at length a curious little deformed image with a hunch on its back, and exactly the color of a three days' old Congo baby. Remembering the embalmed head, at first I almost thought that this black

File: Jody's 20:Texts:melville.mob

Lines: 1813 - 1823 "'I am a Hebrew,' he cries--and then--'I fear the Lord the God of Heaven who hath made the sea and the dry land®' Fear him, O Jonah? Aye, well mightest thou fear the Lord God %then® Straightway, he now goes on to make a full confession; whereupon the mariners became more and more appalled, but still are pitiful. For when Jonah, not yet supplicating God for mercy, since he but too well knew the darkness of his deserts,--when wretched Jonah cries out to them to take him and cast him forth into the sea, for he knew that for %his sake this great tempest was upon them; they mercifully turn from him, and seek by other means to

File: Jody's 20:Texts:melville.mob

Lines: 1873 - 1883 and listen as you listen, while some one of you reads %me that other and more awful lesson which Jonah teaches to %me, as a pilot of the living God. How being an anointed pilot-prophet, or speaker of true things, and bidden by the Lord to scound those unwelcome truths in the ears of a wicked Nineveh, Jonah, appalled at the hostility he should raise, fled from his mission, and sought to escape his duty and his God by taking ship at Joppa. But God is everywhere; Tarshish he never reached. As we have seen, God came upon him in the whale, and swallowed him down to living gulfs of doom, and with swift slantings tore him along 'into the

File: Jody's 20:Texts:melville.mob

Lines: 5983 - 5993 before awful Ahab. Now, Ahab and his three mates formed what may be called the first table in the Pequod's cabin. After their

¹ Symbols like ® and % are used in this text to represent formatting characteristics like italics that were presumably not available on the computer on which this electronic text of *Moby Dick* was originally input.

departure, taking place in inverted order to their arrival, the canvas cloth was cleared, or rather was restored to some hurried order by the pallid steward. And then the three harpooneers were bidden to the feast, they being its residuary legatees. They made a sort of temporary servants' hall of the high and mighty cabin. In strange contrast to the hardly tolerable constraint and nameless invisible domineerings of the captain's table,

File: Jody's 20:Texts:melville.mob

Lines: 7131 - 7141

ife, in the wonderfulness and fearfulness of the rumors which sometimes circulate there. For not only are whalemens as a body unexempt from that ignorance and superstitiousness hereditary to all sailors; but of all sailors, they are by all odds the most directly brought into contact with whatever is appallingly astonishing in the sea; face to face they not only eye its greatest marvels, but, hand to jaw, give battle to them. Alone, in such remotest waters, that though you sailed a thousand miles, and passed a thousand shores, you would not come to any chiselled hearthstone, or aught hospitable beneath that part of the sun; in such

File: Jody's 20:Texts:melville.mob

Lines: 7425 - 7435 set on edge, for a pursuit so full of rage and wildness as the bloody hunt of whales. Gnawed within and scorched without, with the infixed, unrelenting fangs of some incurable idea; such an one, could he be found, would seem the very man to dart his iron and lift his lance against the most appalling of all brutes. Or, if for any reason thought to be corporeally incapacitated for that, yet such an one would seem superlatively competent to cheer and howl on his underlings to the attack. But be all this as it may, certain it is, that with the mad secret of his unabated rage bolted up and keyed in him, Ahab had purposely sailed upon

File: Jody's 20:Texts:melville.mob

Lines: 7478 - 7488 man's soul some alarm, there was another thought, or rather vague, nameless horror concerning him, which at times by its intensity completely overpowered all the rest; and yet so mystical and well nigh ineffable was it, that I almost despair of putting it in a comprehensible form. It was the whiteness of the whale that above all things appalled me. But how can I hope to explain myself here; and yet, in some dim, random way, explain myself I must, else all these chapters might be naught. Though in many natural objects, whiteness refiningly enhances beauty, as if imparting some special virtue of its

File: Jody's 20:Texts:melville.mob

Lines: 7668 - 7678 their bailiff in the market-place® Nor, in some things, does the common, hereditary experience of all mankind fail to bear witness to the supernaturalism of this hue. It cannot well be doubted, that the one visible quality in the aspect of the dead which most appals the gazer, is the marble pallor lingering there; as if indeed that pallor were as much like the badge of consternation in the other world, as of mortal trepidation here. And from that pallor of the dead, we borrow the expressive hue of the

shroud in which we wrap them. Nor even in our superstitions do we fail to throw the same snowy

File: Jody's 20:Texts:melville.mob

Lines: 7669 - 7679 Nor, in some things, does the common, hereditary experience of all mankind fail to bear witness to the supernaturalism of this hue. It cannot well be doubted, that the one visible quality in the aspect of the dead which most appals the gazer, is the marble pallor lingering there; as if indeed that pallor were as much like the badge of consternation in the other world, as of mortal trepidation here. And from that pallor of the dead, we borrow the expressive hue of the shroud in which we wrap them. Nor even in our superstitions do we fail to throw the same snowy mantle round our phantoms; all ghosts rising in a milk-white

File: Jody's 20:Texts:melville.mob

Lines: 7671 - 7681 supernaturalism of this hue. It cannot well be doubted, that the one visible quality in the aspect of the dead which most appals the gazer, is the marble pallor lingering there; as if indeed that pallor were as much like the badge of consternation in the other world, as of mortal trepidation here. And from that pallor of the dead, we borrow the expressive hue of the shroud in which we wrap them. Nor even in our superstitions do we fail to throw the same snowy mantle round our phantoms; all ghosts rising in a milk-white fog--Yea, while these terrors seize us, let us add, that even the king of terrors, when personified by the

File: Jody's 20:Texts:melville.mob

Lines: 7677 - 7687 expressive hue of the shroud in which we wrap them. Nor even in our superstitions do we fail to throw the same snowy mantle round our phantoms; all ghosts rising in a milk-white fog--Yea, while these terrors seize us, let us add, that even the king of terrors, when personified by the evangelist, rides on his pallid horse. Therefore, in his other moods, symbolize whatever grand or gracious thing he will by whiteness, no man can deny that in its profoundest idealized significance it calls up a peculiar apparition to the soul. But though without dissent this point be fixed, how is

File: Jody's 20:Texts:melville.mob

Lines: 7736 - 7746 of long lacquered mild afternoons on the waves, followed by the gaudiest and yet sleepest of sunsets? Or, to choose a wholly unsubstantial instance, purely addressed to the fancy, why, in reading the old fairy tales of Central Europe, does "the tall pale man" of the Hartz forests, whose changeless pallor unrustlingly glides through the green of the groves--why is this phantom more terrible than all the whooping imps of the Blocksburg? Nor is it, altogether, the remembrance of her cathedral-toppling earthquakes; nor the stampedes of her frantic seas; nor the tearlessness of arid skies that never

File: Jody's 20:Texts:melville.mob

Lines: 7752 - 7762

ima, the strangest, saddest city thou can'st see. For Lima has taken the white veil; and there is a higher horror in this whiteness of her woe. Old as Pizarro, this whiteness keeps her ruins for ever new; admits not the cheerful greenness of complete decay; spreads over her broken ramparts the rigid pallor of an apoplexy that fixes its own distortions. I know that, to the common apprehension, this phenomenon of whiteness is not confessed to be the prime agent in exaggerating the terror of objects otherwise terrible; nor to the unimaginary mind is there aught of terror in those

File: Jody's 20:Texts:melville.mob

Lines: 7834 - 7844 whiteness, and learned why it appeals with such power to the soul; and more strange and far more portentous--why, as we have seen, it is at once the most meaning symbol of spiritual things, nay, the very veil of the Christian's Deity; and yet should be as it is, the intensifying agent in things the most appalling to mankind. Is it that by its indefiniteness it shadows forth the heartless voids and immensities of the universe, and thus stabs us from behind with the thought of annihilation, when beholding the white depths of the milky way? Or is it, that as an essence whiteness is not so much a color as the

File: Jody's 20:Texts:melville.mob

Lines: 9540 - 9550 from the mast-heads of one ship to those of the other; yet, those forlorn-looking fishermen, mildly eyeing us as they passed, said not one word to our own look-outs, while the quarter-deck hail was being heard from below. "Ship ahoy! Have ye seen the White Whale?" But as the strange captain, leaning over the pallid bulwarks, was in the act of putting his trumpet to his mouth, it somehow fell from his hand into the sea; and the wind now rising amain, he in vain strove to make himself heard without it. Meantime his ship was still increasing the distance between. While in various silent ways the

Appendix B
Examples from Humanist

ENGLISH/PHILOSOPHY PROGRAMS

Date: Tue, 03 Sep 91 20:01:42 CDT
From: Charles Ess <DRU001D@SMSVMA>
Subject: grad programs in English/Philosophy

On behalf of a student -- who already has a M.A. in English, as well as B.A. in English -- I wish to request information on doctoral programs which allow for combining philosophical studies with literary studies. In particular, she is not interested in analytic philosophical approaches, but approaches which are, directly or indirectly, supportive of cultural criticism, PLUS literary studies emphasizing recent theories which also involve cultural critique. She's excited about people such as Foucault, LaTour, some of the French feminists, etc. -- but she also sees the need for grounding cultural critique in philosophical analyses. (I would commend to her critical theory, among others, but I'm not sure of a graduate program which includes such a topic.) Suggestions and recommendations would be appreciated. Greetings to all who find themselves starting up yet one more semester... Charles Ess
Drury College Springfield, MO 65802

Date: Wed, 4 Sep 91 08:05 EDT
From: "Tom Benson 814-865-4201" <T3B@PSUVM>
Subject: Re: 5.0302 Qs: English/Philosophy Programs

Charles Ess asks on behalf of a student about programs allowing combination of English (with theory) and Philosophy. It might be worth checking out the programs at Penn State University, where there are strong programs in both fields; try contacting Prof. Wendell Harris, Dept. of English, Penn State, Burrowes Bldg., University Park, PA 16802; in Philosophy, try Prof. Irene Harvey, Dept. of Philosophy, Penn State Univ., Sparks Bldg, University Park, PA 16802. Penn State also offers an excellent interdisciplinary PhD program well adapted to such students; for this, contact Prof. Joseph Kocklelmans, Dept. of Philosophy, Sparks Bldg, Univ. Park, PA 16802.

Tom Benson Penn State (2) -----
---19---

Date: Wed, 04 Sep 91 11:23:07 BST
From: stephen clark <AP01@liverpool.ac.uk>
Subject: Re: English/Philosophy Programs

If UK graduate programs are acceptable, try Warwick University. Alternatively, Essex University, or perhaps Kent.

Stephen Clark Liverpool

Date: Thu, 5 Sep 91 9:35:17 EST
From: raskin@j.cc.purdue.edu (Victor Raskin)
Subject: Re: 5.0302 English/Philosophy

In connection with Charles Ess' question on graduate programs in English and Philosophy I must plug my own institution, especially since it is not my program and the colleagues involved are not netters. Purdue's English and Philosophy is a high-powered Ph.D. program operated jointly by the Departments of English and Philosophy. The admissions are quite competitive. On the English side, it's a bunch of theorists led by Vincent Leitch and the philosophy side is dominated (in the good sense) by Calvin Schrag. Write to either of them in the Departments of English or Philosophy, respectively, at Purdue University, W. Lafayette, IN 47907, USA, Tels.: (317) 494-3740 ENGL or (317) 494-4276 PHIL. Fax: (317) 494-3780 (ENGL). I would be happy to relay e-mail to either Vince or Cal as well. --

Victor Raskin
English and Linguistics

raskin@j.cc.purdue.edu Professor of
(317) 494-3782

MIGNE

Date: Thu, 29 Aug 91 18:29:18 CST
From: (James Marchand) <marchand@ux1.cso.uiuc.edu>
Subject: Franklin Vulgate

This is, I hope, not a commercial, but I have been using for sometime the Franklin hand-held Holy Bible, King James Version, and it is a godsend. I can instantly look up any passage or any wording, for example: "bowels" "compassion" and get immediate response, and I can use any number of search criteria. The point to this posting is: I would like to try to persuade them to put out a Vulgate in this form, which would really be a godsend (pun intended second time also). Write me if you think this is a good idea, and I will contact them. If we get this and Migne too, Medieval Studies will be smoking. Jim Marchand

Date: Wed, 4 Sep 1991 08:48 EST
From: "Paul J. Constantine, Yale Univ. Library"
<CONSTANTINE@YALEMED.BITNET>
Subject: Re: 5.0300 Rs: Mauthner; French Grammar; Vulgate (3/42)

Regarding Jim Marchand's plea for an e-text of Migne, Chadwyck-Healey is advertising a cd-rom and tape version of the Patrologia Latina. It is not cheap--the cd-rom version, on 4 disks, is ca. \$60,000. I imagine that Chadwyck-Healey can provide brochures to interested parties. Paul J. Constantine Yale University Library

Date: Wed, 4 Sep 1991 20:48:51 -0400
From: mccarty@epas.utoronto.ca (Willard McCarty)
Subject: Migne on CD-ROM

Migne on CD-ROM sounds at first like a godsend to medievalists and others, but I wonder. How reliable are the texts Migne used? Why did the CD-ROM publisher not go to those texts rather than copy Migne, who presumably introduced errors? Is there any evidence that small libraries may prefer the CD-ROM, however expensive, to the requisite books?

Our scholarship once rested on the sometimes faulty memories or incomplete knowledge of memorious giants. In the near future will it rest on large, flawed electronic corpora?

Willard McCarty

Date: Thu, 05 Sep 91 16:52:51 CDT
From: "C. M. Sperberg-McQueen" <U35395@UICVM>
Subject: Re: 5.0307 Rs: Migne; BCE; English/Philosophy

On Thu, 5 Sep 1991 17:29:46 EDT Willard McCarty said: >Migne on CD-ROM sounds at first like a godsend to medievalists and others, >but I wonder. How reliable are the texts Migne used? Why did the CD-ROM >publisher not go to those texts rather than copy Migne, who presumably >introduced errors? ...

>Our scholarship once rested on the sometimes faulty memories or >incomplete knowledge of memorious giants. In the near future will it >rest on large, flawed electronic corpora?

Migne's great publishing enterprise was a cultural event of the first magnitude, and has deeply affected the way subsequent readers have approached the authors he printed. One reason for reproducing Migne, and not Migne's sources, is that for the last 100 years and more people have been reading Migne's editions, and not his copy texts. If we care about the life of texts within a culture, Migne is important flaws and all, and somewhat more important, probably, than most of his copy texts (which actually, as I'm sure Willard knows full well, are a very mixed bag as viewed by today's scholarship). If one is interested in the best modern critical editions of the authors in PL, one should be reading newer critical editions, where they exist. The catch is that last phrase, since mostly newer critical editions do **not** exist.

The Migne CD ROM will be irremediably 'flawed' if one judges it as an attempt to provide access to the newest scholarly opinion about patristics, just as Migne is flawed if judged by that standard. (Oddly, though, no one seems to be unhappy that Kraus or whoever is still reprinting Migne, the way some are unhappy about the CD-ROM.) But it is in fact merely an

attempt to put onto CD-ROM a collection which is both (a) an important cultural event in its own right and (b) still an indispensable tool -- albeit a dangerous one, I am told -- for many areas of study.

Let me raise my hand and say right out that when the Chadwyck-Healey project was merely a gleam in Eric Calaluca's eye, I told him that Migne could be regarded either as defining a genre or collection of texts (in which case his editions are immaterial and a 'new Migne' of exactly the same texts in different editions would be appropriate), *or* as a publishing event which took place in the 19th century and which produced a particular collection. As a medievalist with a long-standing interest in problems of text criticism, I said it would be crazy to take the first view in a CD-ROM of Migne's PL. If you want a CD-ROM of patristic texts, then take the best editions you can. But if you say you are making a CD-ROM of *Migne*, then you damn well better be reproducing Migne, because otherwise how the hell am I going to prove that X or Y or Z was quoting from Migne's edition rather than From Watenpuhl's edition of 1544 (as his footnote claims). A CD-ROM that purported to be 'Migne' but actually reproduced some other set of editions would be, to my way of thinking, far more flawed, because far less clear about what it was doing, than the simple and straightforward project undertaken by Chadwyck-Healey, which will do what it purports to do.

So if you want to know what idiots are responsible for C-H's decision, here I am. I did not make the decision, it not being mine to make, but I think it is the right decision. I'm made more comfortable by the knowledge that the rest of the editorial board, who know a lot more about patristics than I do, all agree with it as well. But I won't hide behind the skirts of patristic scholars; what I say is that to reproduce an important source is a good deed, not a flawed one. Charlton Hinman did more for Shakespearean text criticism than most critical editors, and Chadwyck-Healey will do more for patristics, as well as all the other fields where PL is used, by reproducing Migne than by waiting another fifty years for better editions.

Michael Sperberg-McQueen, University of Illinois at Chicago (2) -----
-----117---

Date: Fri, 6 Sep 91 16:26 EST
From: FZINN@OBERLIN.BITNET
Subject: Migne

With regard to the availability of patristic and medieval Latin texts on CD-ROM, there is much to be said about the CETEDOC "Electronic Data Library" with the Cetedoc Library of Christian Latin Texts on CD-ROM. One of the benefits of the International Conference on Patristic Studies in Oxford, England, was the demonstration of this disk and associated software by Paul Tombeur of CETEDOC and several representatives from Brepols. I plan to post more information on this over the weekend. Just let me say now that for me at least the software and CD-ROM offer "everything you always wanted" and perhaps a bit more. This is it. As the CETEDOC/Brepols brochure says-- "Providing a future for the past." (There is perhaps one

thing better than the CD-ROM-----hearing Paul Tombeur's enthusiasm as he gives a demonstration!)

More to come on this topic.

Grover A. Zinn, Jr. FZINN@OBERLIN

Date: Wed, 11 Sep 91 17:09:28 METDST
From: Harry Gaylord <galiard@let.rug.nl>
Subject: On Migne

<flame> The question about Migne is complicated. It was an important publishing event which has influenced scholarship ever since, and not all to the good. Pere Migne made a list for a publishing project both for Latin and Greek. Then he got a copy of an edition for each work and handed it over to printers to reprint. The criteria which he used in deciding which edition to copy would be an interesting research paper. In any case the text in PL and PG is only an inferior version of the edition which Migne's printers copied. Many new and improved editions of works have appeared since PL. The largest collects of these are those of CC in Belgium and CSEL in Vienna. There are many others spread out among other publishers. It would not be a paltry thing to draw up the list of editions which should be included in a similar project today, though there are modern bibliographies from which one could start. This is in fact what scholars most need as a tool. Yet having drawn up such a list, one would have to obtain the permission

from authors and publishers to put them on CD-ROM. It should not be called Migne, but it should include all the works which are included in Migne as well as those published for the first time since PL appeared. I understand that Chadwyck-Healey tried to get permission from the Belgian and Austrian publishers of the series mentioned and well as Edition de Cerf for Sources Chre´tiennes, but were apparently unsuccessful. Chadwyck-Healey has now decided to publish Migne on CD-ROM sec. This is a far less interesting project mentioned above and by Willard. In the meantime CETEDOC has announced its plan to publish its collection of Latin texts on CD-ROM, see the announcement on Humanist, Vol 5, No. 0664.

Dated 31 Oct 1990. One difference between the two projects is that Chadwyck-Healey has announced it will be using the TEI tags for coding. We do not know what method of encoding is being used by CETEDOC. The thing that worries me as a scholar is that my university librarian may get the Chadwyck-Healey advert and think, Ah, I need that because it is the standard work in the Medieval reading-room. The librarian hasn't noticed that all the scholars who know what they are doing order up other editions from the stacks when they are doing their study. The librarian will pay the high price for this obsolete instrumentarium and will not have the funds when scholars come requesting the better product when it comes available. It is a sad thing that not everyone working in medieval studies keeps up to date with text editions. Those who do not are the ones who always and only

consult Migne. Of course, in many cases it doesn't matter. But in many it does. Having Migne on CD-ROM and the better editions not will only perpetuate the wrong use of Migne. If I want to see what the readings are for a passage are, I need in the following rank: 1. the best edition whether it be modern or pre-Migne 2. the pre-modern editions 3. Migne's edition. If I am studying the history of the use of Migne or how mistakes live on even after they are corrected, a not uninteresting subject, I need all 3 of the above. </flame> Harry

Date: Wed, 11 Sep 91 15:47 EST
From: FZINN@OBERLIN.BITNET
Subject: Forthcoming Brepols CD-ROM

This is being posted on HUMANIST and ANSAX-L as a contribution to inform members of those lists about the Brepols/CETEDOC CD-ROM of Latin patristic and medieval authors. I have no intention of starting a discussion concerning the relative merits of this collection of texts vs. the collection being presented in the Chadwyck-Healey CD-ROM of Migne. Michael Sperberg-McQueen has posted a very good note on HUMANIST concerning the Migne CD---his point about doing Migne and not Migne's sources is excellent. There is a place for both of these CD-ROMs in our world. I should also supply the standard disclaimer that I have no vested interest in the Brepols/CETEDOC CD-ROM. I just hope to be a user!@

At the recent International Conference on Patristic Studies held in Oxford, England, representatives from Brepols and CETEDOC demonstrated the CD-ROM of the CETEDOC Library of Christian Latin Texts. According to the brochure at the conference, this CD-ROM (which contains about 21 million words of text) includes: (1) "almost all" of the 250 volumes now available in the Corpus Christianorum, Series Latina, and Continuatio Mediaevalis; (2) the complete corpora of Augustine, Jerome and Gregory the Great, with works not yet edited in CC being taken from the "best editions available in other collections" and destined to be replaced by CC texts when available; (3) some texts not yet published in the CC, for example the Etiymologiae of Isidore of Seville.

The demonstration of the CD-ROM and associated software by Paul Tombeur of CETEDOC was convincing, to say the least. The program (which runs on an MS-DOS machine) makes extensive use of windows to provide an elegant, easy-to-use, and convenient interface. Searches are defined through a combination of "fill in the blanks" and "check on the list" moves. Searches are very fast, due to the fact that the texts are already indexed on the CD-ROM. Pop-up windows provide a complete list of authors in the database for selecting "authors" for search (or you can enter authors individually); the same is true for titles to be searched. For specifying words for searching, truncation and wild cards are provided, as well as searching by word ending (e.g. -aliter). Boolean operators are provided for searches. (These apparently work for occurrences within sentences, but not for

simultaneous occurrences that are not within the same sentence. Sentence generally means what we mean today, but in the case of a very short sentence, the context searched is a bit "broader", so I was told.)

The results of the search (i.e. references, words in their contexts, etc.) can be saved on a diskette or directed to a printer.

The program runs on IBM PC/XT/AT machines or compatibles (hard disc not required but recommended). An IBM AT is recommended, with a CD-ROM drive with controller card and MS-DOS CD-ROM Extensions 2.0 or higher.

Although I have not been a heavy user of CD-ROM search and retrieval programs, I must say that the interface designed for this application and the various help/information windows make this an elegant and easy-to-use program in comparison with the other programs that I have used. (The screen presentation uses English, French or German as the language, with switching between them possible. The color display is rather nice, too.)

The announced date for "publication" is November 1, 1991. Now for the expensive part of the news: This CD-ROM is not inexpensive, but then we all know that Brepols publications are not inexpensive either! There are several categories of pricing. The cheapest is for those who place a standing order for future updates of the CD-ROM (every 2 years, with a minimum of 25% new material) and who also subscribe to the TPL---the price is 75,000 BEF; for "CD-ROM standing order" folks who don't subscribe to the TPL the price is 94,000 BEF. IF you do not subscribe to future updates of the CD-ROM the prices are 100,000 BEF and 125,000 BEF for the two categories described above. Second copies to the same institution are half-price, as are CD-ROMs purchased by persons whose institutions have purchased the CD-ROM.

All in all, this looks like a superb tool for scholars in all areas of patristic and medieval studies. The various microfiche thesauri published by Brepols make searching the works of authors possible, but the range and convenience of searching (especially with Boolean operators) are both expanded with the CD-ROM. I certainly look forward to searching the works of Gregory the Great right now and the works of various twelfth-century authors as they are added to the data base. It certainly would have been easier to locate the source of a passage from Augustine quoted by Hugh of St. Victor if this database had existed last spring (or if I had access to the microfiche thesaurus for Augustine)! In Oxford, as I looked at the results of one search, I had the momentary feeling that one could be overwhelmed by the data. However, I would rather deal with the flood than not have it available!

This has been rather long. I hope it proves useful to some, if not all. Again I provide the standard disclaimer---I have no relationship to Brepols, the project, etc. If you want a brochure or further information I assume you

could request one from Brepols. The address is Baron Fr. du Fourstraat 8, B-2300 Turnhout, Belgium. Tel: 32-14-41.54.63. Fax: 32- 14-42.89.19.

Grover A. Zinn, Jr. Oberlin College FZINN@OBERLIN

Date: Fri, 13 Sep 1991 14:07 CST
From: ELIASON@GACVAX1.BITNET
Subject: Re: 5.0315 E-Patristics

The question of the value of Migne is even more complicated than the discussion of E-patristics has let on so far. Scholars use the texts in Migne for different purposes and for different reasons. If you are studying Augustine's thought, you obviously want the edition which best represents "what Augustine actually wrote." If you are studying how a Bernard uses Augustine, you want the edition which represents "what Bernard actually read." These are two different "best" editions. Neither is likely to be Migne. My point is only that ranking the relative authority of editions is a tricky business, that an editor's trash is sometimes a scholar's treasure. Those who have to make decisions about allocating thin resources for expensive electronic editions face a genuinely difficult dilemma.

Eric Eliason ELIASON@GAC.EDU

(2) -----46----

Date: Fri, 13 Sep 91 12:14:54 MST
From: Dan Lester <ALILESTE@idbsu.idbsu.edu>
Subject: Re: 5.0315 E-Patristics (2/156)

On Thu, 12 Sep 1991 13:59:45 EDT you said: >Date: Wed, 11 Sep 91 17:09:28 METDST >From: Harry Gaylord <galiard@let.rug.nl> >Subject: On Migne > The thing that worries me as a scholar is that my university librarian >may get the Chadwyck-Healey advert and think, Ah, I need that because it >is the standard work in the Medieval reading-room. The librarian hasn't >noticed that all the scholars who know what they are doing order up other >editions from the stacks when they are doing their study. The librarian >will pay the high price for this obsolete instrumentarium and will not >have the funds when scholars come requesting the better product when >it comes available.

As a librarian, I hope that you will GO TODAY to your liaison librarian, or the acquisitions librarian if you don't have a departmental liaison, and let him/her know your feelings. Hopefully the library would not make such a major commitment of funds without consulting the appropriate faculty, anyway, but we all know the dangers of assuming! So, all who have strong feelings on these or related library matters (of which I personally know next-to nothing), talk to your librarians so that they will make the best expenditures of their limited dollars... the expenditures which will most benefit you and your students.

dan

***** * Dan Lester Bitnet: alileste@idbsu * Associate
University Librarian Internet: alileste@idbsu.idbsu.edu * Boise State
University * Boise, Idaho 83725 You can be sure these ideas are
my * 208-385-1234 own; no one else would have them.

Date: Tue, 17 Sep 91 11:12:23 +0200
From: Timothy.Reuter@MGH.BADW-MUENCHEN.DBP.DE
Subject: Migne

The Migne debate so far has been very interesting, but in my view a bit hard on old JPM and his practical uses. One might note first the reversal for editions of the old tag about manuscripts: it's not recentiores non deteriores but for editions vetustiores non deteriores. In other words, there are some none-too-wonderful editions in CSEL, CC and CCCM as well. Besides which, what is available in these newer series is, except perhaps for one or two (admittedly major) authors, only a fraction of what is in Migne.

All that doesn't deal with the question of accurate texts; but I think this is being overplayed. It's true that occasionally JPM got hold of an earlier edition which was lousy, and also that sometimes his printers made things worse (though if the first edition is the basis that should not be too much of a problem). Nevertheless, what is there is by and large what should be there; my experience is that modern critical editions give you a greater feeling of security, not a different text. I may get some wrong information (either as suppressio veri or as suggestio falsi) by running a search program on a CD-ROM of Migne; but that is trivial compared with the wrong information I will inevitably get, since I do not possess a photographic memory, if I do not have access of this kind to the Migne corpus at all. As a corpus, the choice of Migne makes good sense; it is very substantial, reasonably coherent and uniform, and widely available. This last is an important point: once you've used CD-ROM to locate interesting points you can then go to the texts themselves easily and read the contexts, using Migne. If the precise wording of a passage is really critical to your argument you might then want to look it up in a reliable critical edition (if you're lucky and there is one), as you should no doubt do in any case later, when preparing for publication; if it's really of crucial importance you might decide not even to put your trust in recent editions, but to go back to the mss. instead - accuracy and reliability are always relative to what you happen to be doing. But you don't normally need to be held up by edition snobbery while doing your thinking!

No one has yet asked the really critical question, which is: how accurate is the CD-ROM of Migne going to be as an electronic transcription of Migne?

The risks there seem to me to be much higher than the risk that JPM doesn't give you Augustine or Jerome quite accurately; and it's perhaps here that BREPOLS/CETEDOC have the edge, since they can use their own typesetting tapes. We are after all talking about 216 volumes at an average of about 1200 columns, each containing rather more text than a page of a modern edition - say 1000 MB at the least for "pure ASCII", with only line feeds and form feeds and spaces and no other mark-up. If that is done within a reasonable time with no more errors being introduced than were introduced at the stages of (a) the pre-Migne edition and (b) the Migne reprint it will still be a remarkable and worth-while achievement - and it will make the later creation of richer and more accurate e-texts easier, just as Migne and early critical editions have made later critical editions possible.

Timothy Reuter MGH Munich (2) -----
-----23-----

Date: Tue, 17 Sep 91 09:34:35 MST
From: Skip <DUSKNOX@IDBSU>
Subject: Re: 5.0320 Rs: More on Migne (2/55)

Having Migne is a hundred times better than having nothing. As another person pointed out, there are a score of different uses to which such a collection could be put, including providing an invaluable resource for students of language. I did my master's thesis from the MGH and was delighted and overwhelmed at having such a resource.

Working scholars know, or should know, the limitations of whatever critical edition they use. I'd hate to see librarians put off by overly narrow, needlessly negative comments.

ELLIS 'SKIP' KNOX Historian, Data Center Associate Boise State University
DUSKNOX@IDBSU.IDBSU.EDU

Appendix C
Woman Writers Biographical Project
Data Outline

Published Research guide (Book) and Database

current explanation only

DATABASE ONLY

RESEARCH GUIDE ONLY

1. Surname, firstname
2. Cross reference: see surname, firstname *major entry to be under best known version of name, irrespective of phase it represents of author's life*
3. Birth name: as full as we know, surname last
4. Pseudonyms: a) pen names FLAG MALE OR FEMALE
b) VARIANTS OF REAL NAME
5. Birth date: day month year NOTE IF QUESTIONABLE
6. Birth place: region or town; province; country if not Canada
7. Death Date: day month year NOTE IF QUESTIONABLE
8. Death Place: region or town; province; country if not Canada
9. CAUSE OF DEATH
10. Father: firstname, surname (life dates)
11. Father: occupation
12. Mother: firstname (maiden name) surname (life dates)
13. Mother: occupation
14. First Marriage: date, place; or Unmarried
15. Second Marriage: date, place
16. Third Marriage: date, place
17. First Husband: name (life dates) DEATH DATE FLAGGED *TO ALLOW EASY NOTATION OF WIDOWHOOD*
18. Second Husband: same as first
19. Third Husband: same as first
20. First Husband: occupation(s)
21. Second Husband: occupation(s)
22. Third Husband: occupation(s)
23. Children: list names (life dates) (Mrs.) *husbands full or last name for married daughters*
24. Other Writers in Family: name; relationship
25. Religion
26. **DESCRIPTIVE PARAGRAPH (MEMO FIELD?)**
27. EDUCATION: DISTINGUISHED HOME, INSTITUTIONS (INCLUDING LOCATION), DATES, DEGREES, OTHER VAGUE BITS OF INFORMATION
28. TRAVEL: PLACES, DATES; ALLOW FOR UNCERTAINTY
29. PAID WORK: PROFESSION
30. UNPAID WORK: (INCLUDING CLERGYMAN'S WIFE) VOLUNTEER)

31. RESIDENCES: PLACES, DATES; ALLOW FOR UNCERTAINTY
32. OTHER ARTISTIC ACTIVITY
33. Significant literary awards: prize: date *allow up to 4*
34. OTHER LITERARY AWARDS
35. Major Literary Organizations: CAA, CWPC, etc.—note major executive positions and dates
36. OTHER CLUBS
37. LITERARY FRIENDS
38.

	B o o k s	F L A G	J U V E N I L E
a) Poetry	title.	place:	publisher's date
b) Fiction	title.	place:	publisher's date
c) Drama	title.	place:	publisher's date
c) Mixed	title.	place:	publisher's date
e) Autobiography	title.	place:	publisher's date
f) Other	title.	place:	publisher's date
39. **SELECTED PERIODICALS CONTRIBUTED TO: TITLES ONLY**
40. PERIODICALS: ALLOW FOR MUCH DETAIL, IN A STANDARD BIBLIOGRAPHICAL FORMAT, UP TO SEVERAL PAGES OF INDIVIDUAL ITEMS
41. **SIGNIFICANT ARCHIVAL SOURCES: UP TO 4 INSTITUTIONS**
42. ARCHIVES: AS COMPLETE AS POSSIBLE: DETAILS OF INSTITUTION, NAME OF COLLECTION, SIZE; NOTE MATERIAL IN PRIVATE HANDS (NAME INDIVIDUAL AND ADDRESS)
NOTE DIARIES
43. **SELECTED RESOURCES: UP TO 6 BIOG. AND BIB. ITEMS, STANDARD BIBLIOGRAPHICAL FORMAT**
44. RESOURCES: EVERYTHING, INCLUDING CRITICISM, IN A STANDARD BIBLIOGRAPHICAL FORMAT; UP TO SEVERAL PAGES
45. MEMO FIELD FOR MISC. OTHER DETAILS (SUCH AS FIRST PUBLICATION)
46. INFORMANT: NAME AND ADDRESS

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