# The Socio-Technical Humanities: Reimagining the Liberal Arts in the Age of New Media, 1952-1969.

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## Abstract

This dissertation is a study of the aims, interests and rationale underlying the endeavors of a distinct group of humanists who sought explicitly to guide the meanings, uses and developing customs and habits of new educational, informational and computing technologies in the 1950s and 1960s. In particular, this study examines and historicizes the emergence of a new cadre of humanists in this period--"socio-technical humanists," as I have labeled them, who advocated for a new kind of humanities made socially relevant and publically engaged via this hands-on intervention with new media technologies. Ultimately, socio-technical humanists laid the groundwork for humanists' contemporary engagement with digital formats. Yet, because histories of early humanities computing have been fixated on more recent eras--since the rise of personal computing and the Internet--socio-technical humanists of the 1950s and 1960s have remained invisible to analysts and commentators on the "digital revolution" the "digital humanities," and the "crisis of the humanities." This dissertation seeks to recover that lost history.

This study is based on an analysis of published scholarly discourse, conference proceedings, personal and organizational papers and reports from the U.S. Office of Education. It lies at the nexus of three separate scholarly literatures: 1) the history of academic humanities; 2) the history of early humanities computing; and 3) and new media studies. The history of the academic humanities, while a topic of great concern in recent years, has been singularly focused on humanists' efforts to incorporate new subject matter and materials into their research and curricula in the 1950s and 1960s and has thus completely missed the ways in which humanists struggled, in the same exact years, to integrate electronic technologies into the humanities enterprise. While histories of early humanities computing have examined the relationship between the humanities and technology in the post-WWII era, they have missed altogether the degree to which the arrival of audio-visual--television and the rapid rise of multimedia instructional systems in the 1960s--sat alongside computation in the minds of humanists as part of the same overall electronic threat to the printed page. Finally, while new media scholars have recently began to study how, in the past, new media have entered into established media ecosystems, they have failed to examine cases in which the custodians of an older media negotiate, openly, the terms by which an older media's associated habits of mind could or should be transplanted to the new media which they sought or were compelled to embrace.

Beyond these much-needed historiographical interventions, this dissertation offers a number of findings, each critical for a fuller understanding of the contemporary status and standing of the humanities today. First, humanists' engagement with the computer and multimedia educational systems in the 1960s played a significant role in pushing the humanities away from a mid-century culture of limited scholarly social responsibility and back towards a turn-of-the-century ethos of broad social engagement. Second, humanists' efforts to use new media to update their social relevancy and to bridge the gap between academia and the outside world goes back, not to the beginning of the Internet, as most scholars today would maintain, but to their widespread use of educational television in the mid-1950s. Third, humanities computing of the 1960s--the predecessor of today's digital humanities--was never limited to quantitative humanities research, but was, rather, from the very beginning, an effort to rethink the nature of the printed-page and, ultimately, a humanities-oriented effort to curb the information explosion of the 1960s by guiding the nature of an emergent electronic textuality.

Structurally, each chapter in my dissertation examines humanists' responses to a particular feature of electronic culture: In chapter one, its status as mass culture (television); in chapters two and three, its multisensory, associative and affective nature (multimedia); and in chapter four, its ability to be stored, retrieved, disseminated and processed as data (machine-readable text).

# Introduction

## I. Preamble

By looking at large-scale humanistic engagements with new media in the 1950s and 1960s, this dissertation examines humanists' intervention in what they saw as the potential migration of education, information and culture from print to electronic networks and from the codex to the screen in the first decades after WWII, an intervention analogous both to renaissance humanists' involvement in the migration of cultural authority from the scarce written page to mechanically repeatable text in the 15th century and to humanists' contemporary engagement with the migration of our cultural heritage to digital formats. Humanists' large-scale engagement with new educational, informational and computing technologies, an engagement which continues till today, emerged in these years, I argue, as part of a widespread, newly felt, sense of techno-social responsibility in the humanities—a kind of humanistic-oriented, technology assessment movement which sought to respond to the post-WWII information explosion and take up the reigns of electronic culture in a way that ran counter to the social sciences, educational technologists and the electronics and engineering communities. This movement saw the emergence of a new cadre of humanities scholars and educators who began to advocate for a new kind of humanities, one which was socially relevant, publically engaged and involved in efforts to guide the nature, uses, and meanings surrounding new media.

The purpose of this dissertation is to uncover, define, examine and historicize the emergence of this new cadre of humanists--"socio-technical humanists," as I shall call them-- in the 1950s and 1960s. In the process, this dissertation accomplishes six main tasks, each critical

for a fuller understanding of the contemporary status and standing of the humanities, especially as they relate to educational and computational technologies—those phenomena which today threaten to destabilize not just the entire humanities enterprise, but all of higher education. First, by examining the emergence of the socio-technical humanities in the 1950s and 1960s, I offer a much-needed corrective to contemporary histories of academic humanities which fail entirely to examine the role technology played in shifting humanists towards broader social engagement in these years. For the humanities in general, I argue, new media functioned like new subject matter and materials in these years; both allowed humanists to speak more directly to student's experience of a rapidly changing world. Second, I establish a four-part scheme for understanding the "crisis in the humanities" from the end of WWII to the present, delineating four distinct, but related crises, each with its own set of values and emphases. Third, by looking at humanists' engagement with educational and computational technologies in the first decades after WWII, I seek to amend histories of early humanities computing by showing the degree to which they must ultimately be located within the larger history of humanists' efforts to come to terms with *all* those features of an electronic world which potentially destabilized print-culture; in particular, the degree to which the audio-visual, as constituted by multimedia educational instruction, and most of all, television, sat alongside computation in the minds of humanists as part of the same overall electronic threat. Fourth, by looking at humanists use of "new" media, I seek to add to new media studies a unique case study, one in which the custodians of an older media negotiated, openly, the terms by which it's associated habits of mind could or should be transplanted to the new media which they sought or were compelled to embrace. Finally, by looking at a moment in the history of the humanities nearly analogous to the contemporary situation--a moment of crisis and crossroads, a moment in which new technologies were both

seen as a total threat but also embraced as never before--I seek to say something about what it means to have "been here before." Looking at this prior moment for instance allows me to correct two major misconceptions regarding the humanities in general: the long-standing feeling that new technologies have always been seen, by humanists, as anathema to the overall aim and wellbeing of their enterprise and the notion that humanists have never been good at demonstrating their social usefulness.

## II. The Absence of Technology in Histories of the Academic Humanities

The history of the academic humanities, especially its challenges and trajectories since WWII, has become a topic of great concern in recent years. No doubt this increase is part of a larger moment of historical self-reflection in the humanities, a hallmark of the myriad books, articles, conference panels, online forums and blog entries that make up the contemporary "crisis in the humanities" literature. But alongside this literature a more intensive scholarly examination of post-WWII humanities has emerged, supported in large part by the Academy of Arts and Sciences' Initiative for the Humanities and Culture. Meant to address many of the same issues instigating current reflections on the humanities crisis, namely, the "new and increasingly complex challenges — political, cultural, technological, and financial — [that] are profoundly altering conditions for the humanities in the United States," the Initiative has sponsored a number of large-scale data collection ventures and reports surveying the current status of the humanities as well as historical studies on the evolution of the humanistic disciplines in the second half of the 20th century. The authors of this historical literature have been singularly focused on examining the ways in which the humanities renegotiated their boundaries in the

post-WWII era by incorporating non-western material, European social and cultural theory, popular culture and the histories and cultures of traditionally underrepresented groups into humanities' research and curricula.[1] Regrettably, these histories have completely missed the ways in which technology offered perhaps the greatest set of boundary issues for humanist in this period. After all, just as humanists struggled with the incorporation of popular culture or women's history in the years after WWII, they too spent a great amount of energy performing the boundary work--the self-reflection, public debate and institutional maneuvering--necessary to make concessions with and assimilate electronic and computational technology. Like these intellectual and cultural histories, my dissertation seeks a fuller understanding of the contemporary status and standing of the humanities by looking at the critical years of development in the 1950s and 1960s, but it does so by investigating their critical relationship to educational and computational technologies.

The 1950s and 1960s was a period of great social and cultural unrest. But it was also as a period of massive media innovation and upheaval. What's more, just as humanists were compelled to respond to larger social and cultural developments in American life in these years, they too were forced to come to terms with large-scale developments in non-print electronic media. Put another way, in the exact same years that *social history*, *cultural studies* and *feminism* were on the minds of many humanists, potentially destabilizing their field's methods and curricula and forcing them to respond to the demands of a new social and cultural environment outside academia, so too the *television*, *computer* and *multimedia systems* were potentially

[1] The central texts here are Hollinger, David A. Ed. *Humanities and the Dynamics of Inclusion Since World War II.* (Baltimore: Johns Hopkins University Press, 2006); Bender, Thomas and Carl E Schorske Eds. *American Academic Culture in Transformation: Fifty Years, Four Disciplines.* (Princeton, N.J.: Princeton University Press, 1998); *Daedalus*. Vol. 135, No. 2, Spring, 2006, On the Humanities; *Daedalus*. Vol. 138, No. 1, Winter, 2009, Reflecting On the Humanities.

destabilizing their print-nurtured, print-enabled and print-inhibited fields and forcing them to respond to the demands of a new media environment inside and outside the classroom. Electronic media of the 1950s and 1960s was, in its various manifestations, immersive, affective, associative, multi-sensory, non-linear, machine-readable and transferable over air waves, satellite transmission and electronic networks. It was everything that print was not. The 1950s and 1960s were the first years in which humanists endeavored to come to terms with these critical features of non-print electronic media and their direct bearing on the humanities enterprise. They were the first years when significant numbers of humanists began to admit that large-scale social forces were changing the way people engaged culture and information, and that to remain vital, they must help instill critical interpretative skills for these new modes of media engagement. These were the first years, that is, when humanists endeavored, on a large scale, to find a way to help guide new cultural and informational practices associated with non-print, electronic media and at the same time remain true to the traditional and perennially important aim of the humanities—the measured, contemplative and reflective engagement of cultural objects.

So how did humanists' engagement with new media force them to redraw the boundaries of their enterprise? I argue that it did so by forcing them into significant new modes of social responsibility. There are times when the dominant ethos in the humanities is one of limited social responsibility. At other times, the prevailing mood is more activist, advocating an expanded social role for humanities scholarship and education. The battle between these two ethos is, on one level, the story of the humanities from the late 19th century to the present. In nearly every period since that time there has been a movement in higher education which seeks to promote the humanities as critically and crucially related to the world outside the academy, to the "actualities of the real world." In every period too, there have been those who resisted such a purpose. In

some cases, the movement for utility is part of a larger emergent educational ethos which seeks to steer education in general towards real world skills. At other times the humanities are singled out as uniquely intractable in its resistance to being "applied" or "useful."

The responsibility to create quality citizens capable of critically engaging ideas, information and culture was a main feature of humanities promotion, or classical education, in the late 19th century. So too was the responsibility to impart moral and mental discipline and the responsibility to counter the technological, scientific and materialistic thrust of modern society by nourishing the value-oriented, philosophic, even spiritual side of individuals. But as humanities educators, in the first four decades of the 20th century, increasingly embraced their role as specialized, discipline-specific researchers and scholars, and in particular, as they began to adopt formalistic, analytical, sometimes positivistic, models of scholarship in the 1940s and 50s, they became less and less socially engaged . That is, they became less responsive to the needs and interests of the public, less likely to offer broad moral guidance and less apt to think of the humanities in general as serviceable to ends outside the academy. Of course such a story focuses only on the emerging dominant ethos in humanities scholarship and education towards specialized scholarship in these years. One can find in each of the first four decades of the 20th century, a number of scholars resisting specialization and advocating a wider social and cultural purpose to the humanities. But ultimately the dominant ethos in the humanities would not swing back towards wider social engagement until the humanities began to respond to social unrest in the 1960s.

In some ways, this is a familiar story. We know that the humanities opened its cannon and its doors, in the 1960s, to new texts and materials, to new subjects and students. The authors of the intellectual and cultural histories above have, in fact already examined many aspects of

this latter shift. Joan Rubin, Gerald Early and Roger Geiger, for instance, have tracked the ways in which humanists began, in these years, to reach out to a public beyond the university, how they addressed subject matter and material vital to the interests of a more demographically diverse student body and how they began to see themselves as responsible for providing a unified culture in postwar America.

What we don't know, and what this dissertation offers, is the sense of what role technology played in this swing back towards social responsibility in the humanities. For, just as addressing popular culture or feminists issues, for instance, in humanities instruction and scholarship in these years allowed humanists to speak more directly to student's concerns and experiences of the world and in turn expand their cultural purview and social charge, so too, humanists engagement with new media and technology directly expanded their sense of what charges, concerns and duties fell within the purview of the humanist both inside and outside the classroom.

Humanists' engagement with new media in the 1950s-1960s—their efforts to come to terms with their role and relevancy in an era of electronic culture—I argue, forced them into significant new modes of social responsibility: a responsibility to explore the relationship between new media and traditional print culture, to work toward a new form of *electronic literacy* and to intervene in, and humanize, the increasingly automated structure and networked transmission of knowledge. In short, the use of new media was a principal way in which humanists were compelled to address key contemporary issues in an era of rapid social-technical change. Indeed, two of the misconceptions about the humanities I hope to correct is, first, the enduring impression that the humanities have always, by and large, been averse to new technologies, and second, the notion that humanists have always poor at demonstrating "the

benefits the academic humanities confer on society," or put another way, have been poor at putting themselves "in play, at risk, in the world."[2] In the 1950s and 1960s, humanists did all of this; not only did they put themselves at risk in the world, and argue for a new kind of social usefulness, but they did so by engaging that phenomenon in human affairs which to this day, many within and without, assume is anathema to the humanities—technology. Humanists large-scale, hands-on engagement with electronic media in the years from 1952-1974, after all, found them caught up in endeavors rare for humanists in the first half of the twentieth century—endeavors to explicitly guide the uses and meanings of new media both within academia and society at large.

**III. The Absence of the Audio-Visual in Histories of the Digital Humanities**

Recent histories of early digital humanities have examined the relationship between technology and humanistic disciplines in the post-WWII era, but they have done so with a very limited scope of inquiry. Scholars such as Dolores M. Burton, Susan Hockey and Thomas Winter have ignored everything but the computer; more limited yet, they have focused only on the computer in humanistic research.[3] Most importantly, they have ignored completely the realm of electronic educational media (the cutting-edge of electronic culture)--instructional television, language and listening laboratories, teaching machines, programmed instruction, computer

[2] *Daedalus*. Vol. 138, No. 1, Winter, 2009, Reflecting On the Humanities, Pp 6.

[3] Burton, M. Dolores. "Automated Concordances and Word Indexes: The Early Sixties and the Early Centers," *Computers and the Humanities*, Vol. 15, No. 2 (Aug., 1981), pp. 83-100. Hockey, Susan. "The History of Humanities Computing," in *A Companion to Digital Humanities*. Schreibman, Susan, Ray Siemens and John Unsworth (eds). (Malden, MA: Blackwell Publishing, 2004). Winter, Thomas Nelson, "Roberto Busa, S.J., and the Invention of the Machine-Generated Concordance" (1999). *Faculty Publications, Classics and Religious Studies Department. Paper 70*.

assisted instruction, "electronic classrooms" and "electronic study carrels." In short, they have missed entirely humanists' responses to, and interventions in, the automation of information storage and transmission in education and society .

By looking at educational television in my first chapter, educational technology in my second and third chapters and early humanistic encounters with computing hardware and software in my fourth and final chapter, it is my aim to locate the history of early humanities computing within the larger story of humanists' attempt to come to terms with all the features of electronic culture—it's capacity to store, retrieve and analyze information (computers) as well as its capacity to impart information in a multisensory, immersive and associative fashion (multimedia educational technology) and its power to deliver information via the greatest mass medium in history to that point (television). In so doing, I have tried to put prophets of the electronic age focused on television and multimedia environments, scholars like Marshal McLuhan and Neil Postman, into conversation with prominent early computing humanists focused on the nature of literature as data, scholars like Stephen Parrish and Louis Milic, I have done so in order to show that, in the minds of humanists (and plenty of others), coming to terms with the mechanization of information via computers was ultimately part of the same effort to come to terms with information in audio-visual formats . Put another way, the computer was not the only vacuum-tube-based electronic technology of the 1950s and 1960s which threatened to destabilize print-culture and potentially the entire humanities enterprise. The television, and by extension multimedia educational systems, was just as destabilizing—and my dissertation has attempted to show that together, they constituted, in total, the new technology of the electronic culture with which humanists, both those focused on computing power and those focused on audio-visual formats, were forced to come to terms with.

**IV. The Socio-Technical Humanities**

Thus my dissertation charts the emergence in the 1950s and 1960s, of an as yet unnamed genre of humanities thinking—what I have termed the "socio-technical humanities." Socio-technical humanists, from the 1950s up to the present, have certain critical defining features. They are advocates and activists for the use and relevance of new media and informational technologies in the humanities. They emphasize humanistic technological interventionism, media literacy, the immersive benefits of electronic media for humanities instruction (what I am calling the "immersive humanities") and the necessity to move beyond print culture. They have an overriding belief in the power of technology to make the humanities relevant again and often focus on the need for the humanities to broaden their interests and appeal beyond the academy. Most importantly, they advocate, first, for a critically socially engaged humanities, and second, argue that the primary way for the humanities to be socially relevant and engaged is for its practitioners to be involved in guiding the nature, use, associated customs and habits of new media. That is, they endeavor to turn the threat of electronic media for the print-oriented world of the humanist on its head, by thinking through and rhetorically negotiating between the critical features of those new media as they relate to the printed page; by then embracing the critical features of those media for humanities research and pedagogy specifically; and ultimately, by advocating for a humanities-oriented intervention in the uses of, and practices surrounding, those media. In this way, the socio-technical humanities link both traditional and reformist principles of humanistic research and pedagogy to the use and critique of new media and information technologies.

Ultimately the central feature of the socio-technical humanities is this: they *defend* the humanities, *in times of crisis*, by linking what the humanities traditionally do, and *now need to do in order to remain relevant*, to the critical and hands-on embrace of these technologies. They are at the same time, and for the same reasons, the first to advocate the use of new media and the first to engage the terms of the humanities crisis in which they live. Thus, it can be said, that in doing so, the socio-technical humanities, have continually confronted, each in their own time, the terms of the humanities crisis in which they live head on. For since the 1950s, crises in the humanities have always been intimately linked up with the threat of electronic media—or more specifically, the eminent threat of a post print world, and questions concerning the role and relevancy of the humanities in that world.

Despite wide-ranging interest in the status of the humanities crisis today, no one has yet offered up an examination of the ways in which the terms of that crisis have shifted over time as humanists responded to social, cultural, economic and technical developments both inside and outside academia. My dissertation offers a four-part scheme for the understanding the crisis in the humanities from the end of WWII to the present. From the early 1950s to early 1960s, the dominant ethos of the crisis can best be described by invoking the title of C. P. Snow's famous 1959 Read lecture, "the Two Cultures." The crisis of the two cultures, as I call it, was a period in which humanists felt distinctly threatened by large-scale advancements in science and technology, and by the expansion of scientific authority in American politics and culture. In the mid-1960s to early 1970s, conditions changed. The unrest of the period made humanists' disengagement with major social issues more of an issue than their disconnect with science and technology. Within this period, which I call the crisis of engagement, the two sets of concerns came together and as such humanists' engagement with technology—especially educational and

computational technology on campus—became a vital way for them to become more socially engaged. In the mid-1970s through the 1990s, the humanities suffered what I call a crisis of confidence as enrollments plummeted and, most importantly, a conservative backlash within the humanities itself began a war over the meaning and mission of the humanities. Finally, from roughly 2000 to the present, in a period I call a crisis of power, humanists have become increasingly worried about the corporatization of higher education and its effects on their standing at colleges and universities.

While I focus on the emergence of the socio-technical humanities in the 1950s and 1960s, that is, within the first two periods of the overall post-war crisis, and then take up the contemporary situation in my conclusion, my dissertation reveals the ways in which the socio-technical humanities, have in each period, mobilized the language of crisis to advocate for the use of new media and technology. In doing so, I argue that the terms of their advocacy have thus, by and large, been dictated by the specific features of the humanities crisis in which they live and make the case that the socio-technical humanities have thrived most fully in those periods in which they have been able to successfully mobilize the language of crisis in their defense.

It's important to understand that in each of these cases there isn't a tidy causal line between humanists' engagement with new media and the expansion of their social role. In the minds of socio-technical humanists the two are not separate enough to be causally related. Socio-technical humanists did not decide to take an interest in television, multimedia systems and machine-readable text, and then, once involved, realize that they, or humanists in general, could or should expand their sense of social responsibility. Nor was it the other way around. They did not decide to be more socially responsible, look around for something to pertinent to be engage with, and then ultimately land on new media and informational technologies. For socio-technical

humanists, the two simply went hand in hand. To figure out the exact relationship between the traditional strictures of print culture and the emerging habits of mind associated with new media is to bring the humanities into the realm of social responsibility. Doing so automatically puts them in a place where they can, for instance, shape people's understanding of the function, meaning and viewing habits of new media, guide student's critical engagement with a rapidly changing, largely multisensory world and affect the nature of new electronic information networks. In other words, for the socio-technical humanist, trying to guide the nature of a new technology while it is still up for grabs, endeavoring to invert or subvert the use of new media by other practitioners and attempting to turn the threat of electronic media for the print-oriented world of the humanist on its head—that is, in total, trying to figure out the role and relevancy of the humanities in an era of electronic culture—is to push the humanities into larger social roles. Socio-technical humanists are advocates for both because they are, in a significant sense, indistinguishable.

**V. The Absence of Agency in New Media Histories**

If humanists' expanded use of new media in the first decades after WWII reveals something significant about the development of the humanities enterprise, so too, it tells us something about how the uses of and meanings surrounding new media are negotiated and formed in the first years after they emerge. From one perspective, my dissertation is an cultural history of humanists' engagement with new media; from another, it is a media history that examines one groups' attempt to come to terms with the emergent meanings and uses of new communications technologies at a time when they were socially un-fixed. In recent years, a

number of media scholars have become interested in recovering the contests that emerge over the meanings, uses and associated practices surrounding particular media in the first years after their emergence. Carolyn Marvin, perhaps the first practitioner of this brand of new media studies, argued famously in *When Old Technologies Were New: Thinking about Electric Communication in the Late Nineteenth Century*, that the use of electronic communications technologies of the late 19th century became occasions for contesting critical social issues—who should speak, who should be connected and who should be believed. More recently, scholars like Lisa Gitelman and the authors in her edited volume, *New Media, 1740-1915*, have become interested in recovering the "uncertain status" or "identity crisis" of given media at the moment of their emergence, a moment when, according to Gitelman, a media's "meaning--its potential, its limitations, the publicly agreed upon sense of what it does, and for whom--has not yet been pinned down."[4] Drawing on Rick Altman's notion of "crisis historiography," these authors show how media when they first appear on the scene, pass through a phase of identity crisis, a crisis only resolved after a negotiation between the nature of the new media and the established environment of representational methods and practices into which that media emerges. As an emergent set of technologies, electronic media of the 1950s and 1960s (television, education technology and machine-readable media) were conceptually un-fixed in the first years after their emergence.

How did humanists insert themselves and their own designs, uses and meanings for electronic media into this heady, but still open-ended, mix of theoretical and futuristic visions? And how did they do so while negotiating with both the established and shifting missions of the humanities enterprise? Missing from Marvin, Gitelman and others' accounts of the "newness" of

[4] Gitelman, Lisa and Geoffrey B. Pingree. Ed. *New Media, 1740-1915*. Cambridge, Massachusetts: MIT Press, 2003. Pg. xv.

new media is the sense of what is at stake when a particular group's long-standing enterprise hangs in the balance between the preservation of an older media, or rather, it's established method of engagement, and the adoption of a new media at a time when its meanings, uses and practices are still up for grabs. I argue that within this open-ended moment, humanists attempted, for their own survival, to re-assign essential features of an older, print-based, media engagement—select critical textual skills—to an entirely new electronic media environment. Also missing from these prior accounts of emergent new media is a sense of open contestation. Instead of focusing on the ways in which an "unthinking social consensus," as Gitelman puts it, ultimately shapes, or even governs, future uses of media, my story is one of open, articulated struggle for the meaning of new media. The difference is key. Marvin and Gitelman et al examine instances where tacit representational practices, customs and habits are negotiated and formed as new media are introduced. By focusing on academic discourse, my story instead emphasizes the fundamentally *intellectual* nature of media, and technology in general. Traditionally, we tend to think of the speculative end of human affairs—the arts, religion or even political institutions—as those phenomena by which humans think through their relationship to each other and to the rest of the world. Likewise, we tend to think of technology, largely, as the means by which people accomplish certain practical goals, typically those goals for which the technology is initially designed. But I want to emphasize the ways in which technologies, especially when they first emerge, are in a fundamental way, the most compelling means by which people think through humankind's relationship to critical features of the world—in my case, the relationship between human nature and the nature of information, culture and knowledge.

**VI. Don't Panic: The Humanities Have been Here Before**

Finally, in telling the story of humanists' engagement with educational and computational media in the 1950s and 1960s, my dissertation seeks to uncover and examine compelling past corollaries to today's situation and in general reveal the astonishing degree to which the humanities "have been here before." Today, new media is transforming higher education, and in particular, those sectors of it bound to print culture. In the last decade, educational technology and academic computing have developed at a rate only comparable to an analogous period of growth in the late 1950s and 1960s. The parallels are in some ways uncanny. The sudden rise of massive open online courses (MOOCs) in the last few years precisely parallels the abrupt growth of educational television in the 1950s and early 1960s, a format which looked and functioned quite similarly to MOOCs, and which were a response to parallel educational crises. Scalable, automated, online instruction now performs almost exactly as intercampus computer assisted instruction (CAI) was hoped to when it was first developed in the early 1960s. Artificial intelligence-driven, automated grading of student prose, a newly viable service widely discussed by educators in the last few years and the final vestige of automated education, began in earnest in the mid-1960s as well. Screen-based, multimedia educational technology was designed by educational system engineers of the 1960s to function essentially as present-day day interactive digital textbooks do. Even the availability of primary texts and lecture material online acts as the contemporary counterpart to the widespread vision of the "networked campus" of the 1960s. In general, many of the grand visions of educational technologists, administrators, educators and information systems specialist of the 1950s and 1960s are just now, in the last ten years, starting to come true.

Take for instance, the recent rise in major mergers and acquisitions between textbook publishers and software companies. In 2010, McGraw-Hill Education, for example, purchased Tegrity, a software company whose latest product automates the recording and subsequent on-demand streaming of college campus lectures. "The move supports a feature of the company's new breed of textbooks, called McGraw-Hill Connect, which lets professors embed their own video lectures inside one of the company's e-textbooks," Jeffrey R. Young reported in the Chronicle of Higher Education.[5]

> That same year Macmillan, another major textbook publisher, entered a partnership with Panopto, a competing lecture-capture company… In October, John Wiley & Sons, another major textbook publisher, bought a company called Deltak.edu, which helps colleges run online courses…Textbook publishers do far more than print books these days. The five biggest players in the textbook market have collectively invested more than a billion dollars in the past five years buying software companies and building technology-services divisions.

Young's report, "The Object Formally Known as the Textbook," was one of a number of articles to cover these mergers, to comment on the digitization of textbook material, and in general, to prophesize the end of print culture in higher education. Yet, this isn't the first time that a spate of mergers between educational publishers and software or electronics firms has signaled the end of print. Rewind and replay. The mid-1960s saw a rash of large-scale mergers,

[5] Young, Jeffrey R. "The Object Formally Known as the Textbook," *The Chronicle of Higher Education*. January 27, 2013.

acquisitions and joint ventures between the nation's leading electronics firms and publishing houses specializing in educational material. In 1964, IBM acquired Science Research Associates, a company specializing in programmed instructional materials while R.C.A. made public negotiations to purchase Prentice Hall, a large publisher of textbooks. Talks between R.C.A. and Prentice Hall fell through in April of 1965, but meanwhile a number of other firms were negotiating similar arrangements. In the summer of 1965, Xerox purchased American Educational Publications and in 1966, Litton Industries acquired the American Book Company, a publisher of elementary, high school and college textbooks and educational records. In that same year, Raytheon Inc. purchased D.C. Heath, another textbook concern and in March, R.C.A. ended up acquiring Random House, the largest of these electronics and publishing arrangements. Joint research ventures between electronics and publishing interests were also popular. In the fall of 1965, General Electric and Time Inc. formed a joint company, the General Learning Company, to produce educational materials, systems and services. The next year, Sylvania Electronics and the Reader's Digest Association announced a joint group to investigate the potential of electronic systems in education. Alongside these more conspicuous, large-scale transactions, other partnerships were being formed. By 1968, this "rash of mergers of 'hardware' and 'software' companies" included over one hundred new partnerships, signaling to many the end of the book as the definitive setting for information storage and transmission.[6] "Publishers are the people who can collect and present learning materials," George Haller, president of

[6] Sharpes, Donald K. "Computers in Education." The Clearing House. Vol. 43, No. 3, Nov., 1968. Pp. 135. Behrens, Carl. "Publishing Goes Electronic." Science News, Vol. 92, No. 2, Jul., 1967. Pp. 44.

General Electric, stated in a typical characterization of these mergers, while engineers "can do a better job of transmitting the material."[7]

As the principal guardians of print culture, humanists of the period were forced to come to terms with these potential shifts in the delivery of culture, information and education. Yet, many, if not most, humanists today feel certain that this is the first time they have had to deal with the potential *threat* or *opportunity* involved in the migration of culture from print to electronic formats. Take educational television of the 1950s and 1960s and today's MOOCs as another set of instructive corollaries. Humanists regularly talk today as though they only now have to reckon with the large-scale implications for print culture of the rising demand and use of massively broadcast, visually-oriented courseware. Yet from the mid-1950s to the early 1960s, as educational television surged, many humanists were compelled to engage the new medium, to adapt humanities content to televisual formats, and in doing so, to think through the relationship between new media (broadcast television) and the printed page. Likewise, educational television of the period reveals the longer history of humanists' effort to use electronic media to broaden their public appeal, to update their social relevancy and to bridge the gap between academia and the outside world. Even now, when it appears most relevant, humanists' large-scale engagement with television in the immediate postwar period remains a largely forgotten history.

Within the current moment of self-reflection in the humanities, one finds the near ubiquitous statement that only now, with the advent of the internet, does there exist a real opportunity to "broaden the humanities" beyond the academy and the k-12 classroom. "New digital media open opportunities for humanists inconceivable during the [1950s and 1960s]," asserted Edward L. Ayers, professor of history at the University of Virginia and co-creator of the

[7] Gilroy, Harry. "Newest Bookman Program the Future," The New York Times. May 27, 1966. Pp. 40.

digital-history website, Valley of the Shadow, in a special 2009 *Daedalus* issue on the status of the humanities, "Websites, lectures, and videos on popular humanities subjects attract millions of visitors from all over the world and all kinds of backgrounds ... Humanists enjoy a range of venues and audiences unimaginable to those who wrote for a few small magazines in the celebrated heyday of public intellectuals."[8]

The overall sense that humanists have only recently begun to embrace modes of popular culture as legitimate objects of investigation combined with the enduring impression that the humanities have always, by and large, been averse to new technologies has led to a view of postwar humanistic, and especially literary, intellectuality as based entirely in print culture--scholarly journals, monographs and little review magazines. Indeed, it seems almost counterintuitive that professors and teachers of English would widely embrace television as a unique medium for "literary experience" and actively broadcast their literary lessons across the nation at the exact moment when our most celebrated postwar literacy set, sometimes referred to as the New York intellectuals, was busy publishing countless diatribes against the new electronic medium in those "small magazines." Engagements with multimedia educational technologies and machine-readable textuality provided similar *fears* and *opportunities* for humanists in these years. Ultimately, these first engagements with electronic culture and computing are the crucial backdrop to present tensions and interactions between the humanities and digital technology and my dissertation clarifies current humanistic attitudes regarding technology in society, education and scholarship by looking at their development in the critical years of the 1950s and 1960s.

[8] Ayers, L. Edward. "Where the Humanities Live," *Daedalus*, (Winter), 2009. Pg. 33.

**VII. Plan of the Present Work**

Each chapter in this dissertation examines humanists' responses to a particular feature of electronic culture: its status as mass culture (television), its multisensory, associative and affective nature (multimedia) and its ability to be stored, retrieved, disseminated and processed as data (machine-readable text). As a media history, each chapter examines the ways in which humanists worked to come to terms with these features of electronic culture as they directly related to the traditional behavioral and intellectual habits associated with print media. As an intellectual history, each chapter examines the ways in which humanists' engagement with these features of new media allowed and or compelled them to redraw the boundaries of their field.

Chapter one looks at the ways in which humanists' used instructional television in the 1950s to fashion a new initiative sometimes dubbed "television literacy"--to convince the first T.V. generation that the television screen was an electronic plane for information retrieval and analytical-somatic experience (even literary experience) as much as it was for entertainment, and in doing so, to reorient the landscape of television programming, and reshape the associated customs, habits, expectations and the publically agreed upon meaning of television altogether. Chapter two examines how practitioners in education, academia and the electronics industry responded to the social implications of the information explosion in the 1960s by embracing a broad range of new educational media, establishing inter- and inner-campus information networks and in general wrestled with shifting notions about the nature of information and the fate of traditional print-based culture. Chapters three and four then examine humanists' particular responses to the developments of chapter two. Chapter three looks at humanists' efforts to re-orient, repurpose and "humanize" the widespread incursion of educational machinery into

campuses and classrooms by behavioral scientists, systems engineers and the electronics industry in the 1960s by using multimedia educational systems to convey the sensual, affective and experiential nature of humanities content, to invoke the full sensorium in getting students to critically engage and interrogate reality and in general, to impart to their students a critical mastery, or literacy, of their new electronic environment. Chapter four looks at early computing humanists and their efforts, at key conferences and institutes, to help shape the nature of electronic textuality and the character of bibliographic control in the 1960s. Together, these critical engagements with new information and computing technologies in the 1950s and 60s reveals the longer history of humanists' effort to use electronic media to broaden their public appeal, to update their social relevancy and to bridge the gap between academia and the outside world. Finally, in my epilogue I take the socio-technical humanities through their quiet years of the 1980s and 1990s—the "crisis of confidence"—before explicating the relationship between the current crisis in the humanities—the crisis of power—and thriving nature of the socio-technical humanities today.

## Chapter 1 || Instructional Television and the Rise of the Socio-Technical Humanities

### I. Introduction

This is a story about the instructional television movement of the 1950s, and in particular about the ways in which English professors and teachers--those self-described guardians of print culture--used instructional television as a way to link the new medium to the printed page. In this chapter, I argue that, like the impulse towards "television education" in the English classroom in these years, literary instructional television allowed professors and teachers of English in the mid-to-late 1950s to work through a series of increasingly salient and increasingly interrelated questions: How do we maintain the core principles of a liberal, humanistic and "bookish" education, and at the same time embrace the potential cultural and educational benefits of television? How do we broaden the appeal of the humanities in an era of curricular reform geared towards science, technology and engineering? And what is the role of the humanists in an era of electronic culture? Ultimately, this chapter tracks the emergence, in the late-1950s to early 1960s, of what I am calling the socio-technical humanities—those who sought to answer these questions, and in turn, to use educational television as a way update the social relevancy of the humanities in a period of perceived crisis.

Tracking the emergence of the socio-technical humanities in these years allows me to accomplish three further historiographical tasks. First, I hope to add to a recent literature which seeks to uncover the productive partnerships between the world of television--that lowliest of lowbrow objects--and highbrow practitioners in the 1940s and 50s; in my case, professors and teachers of English. Traditionally, cultural historians of television have positioned T.V. in the

minds of contemporary thinkers at the losing end of a number of related cultural binaries--class vs. mass, high vs. low and avant-garde vs. derivative.[9] That is, beyond a few cultural critics like Gilbert Seldes and Jack Gould, artists and serious intellectuals of the 1940s and 50s have been consistently characterized as unwavering and unified in their opposition to the "vast wasteland" of television.[10] The opposition was so animated, according to Cecelia Tichi, in her 1991 *Electronic Hearth: Creating an American Television Culture*, that it constituted a second "Two Cultures" front for literary intellectuals of the period.[11] More recently scholars like Lynn Spiegel have attempted to complicate this picture of early television by revealing the intellectual and material connections between television and the art world; in particular, the classical training of network art directors, the recognition among artists and curators that television could play a role in the large-scale dissemination of modern art and the relationship between television's developing aesthetic and postwar art movements.[12] While Spiegel asserts her story as a needed historiographical course-correction to Tichi and others, still missing is a sense in which

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[9] The distinction between the realms of highbrow and lowbrow cultural production has been a particular sticking point for intellectual and cultural historians focused on the immediate postwar years. After all, artists, art critics and intellectuals of the period appeared so unified and unwavering in their distaste for all mass culture. From Theodor W. Adorno, Clement Greenberg and Dwight McDonald to Harold and Bernard Rosenberg, scholars in these two decades established an almost impenetrable conceptual framework for popular culture as a product of media regimes who pacified their audiences and left little wiggle room for interpretive agency. Thus, even when cultural historians in the 1980s began to expose the fully constructed and ultimately shifting nature of the highbrow-lowbrow distinction in American society, they did so only by way of explicitly articulating a rejection of those prejudices established by writers and theorists of the 1940s and 50s.

[10] Newton N. Minow, "Television and the Public Interest."Address to the National Association of Broadcasters, Washington, D.C., May 9, 1961.

[11] See chapter two, "Two Cultures and the Battle by the Books," Tichi, Cecelia. *Electronic Hearth: Creating an American Television Culture*. New York: Oxford University Press, 1991.

[12] Spigel, Lynn. *TV by Design: Modern Art and the Rise of Network Television*. (University of Chicago Press, 2008).

intellectuals and academics--literary scholars and educators, in my case--embraced television as an exciting cultural and informational medium.

Second, I draw upon the insights and interests of new media scholars--media archeologists, in particular--who seek to recover the "uncertain status" or "identity crisis" of a given medium at the moment of its origin, a moment when, according to Lisa Gitelman, "its meaning--its potential, its limitations, the publicly agreed upon sense of what it does, and for whom--has not yet been pinned down."[13] In doing so, I hope to show the degree to which the meaning of television--at least for educators--was up for grabs in the years following the emergence of instructional T.V.

## II. Early Development of Instructional Television

The first television broadcast took place in 1927. In April of that year, Secretary of Commerce Herbert Hoover sat down to view moving images on a 24 inch screen broadcast from Bell Telephone Laboratories in New Jersey to Washington D.C. The first full decade of television, the 1930s, saw a marketplace acutely divided by two incompatible transmission-receiver models, one electromechanical, the other electronic plus a near bedlam of technical standards. Anyone buying a T.V. set in these years had to make sure its method of display was compatible with the mode of transmission from their local station. Their set had to display the same number of lines, both vertical and horizontal, per frame and the same number of frames per second as the broadcast. It also had to be compatible with the sound frequency at which their

[13] Gitelman, Lisa and Geoffrey B. Pingree. Ed. *New Media, 1740-1915*. Cambridge, Massachusetts: MIT Press, 2003. Pg. xv.

local station broadcast. Finally, just before America entered WWII, in 1941, the FCC established industrial standards for transmission and receivers.

After the WWII, T.V. antennas began sprouting on rooftops and commercial broadcasters wasted no time setting up shop. In 1947 one half of one percent of American households owned a television set; seven years later that figure had risen to 56%. But even in these earliest days, there were already advocates who wished to turn television broadcasting, "the social branch of electronics," towards education. Shortly after the War the FCC began its charge of licensing television stations to commercial broadcasters. By 1949 there was a vocal faction of educators, lead by the U.S. commissioner of education Earl J. McGrath, who urged the FCC to reserve broadcasting frequencies for non-commercial educational use. From 1949 to 1951, each year the FCC's table of assignments failed to do so, but in April of 1952 in their *Sixth Report and Order*, 242 of 2,000 channels were set aside for educational purposes.

Nineteen fifty-two also saw the establishment of the Educational Television and Radio Center (ETRC). The ETRC would soon shorten its name to Educational Television Network (ETV) and in the late 1960s would, after the establishment of the Corporation for Public Broadcasting by President Johnson in 1967, merge to form the Public Broadcasting System (PBS). In its early years the ETRC was a major resource center for educational television, maintaining exchange programs between local educational television stations. In 1954 they began producing five hours of original ETRC programming (kinescopes[14]) per week for affiliated stations. The material the ETRC exchanged and produced was of two types, differentiated by educational technology professionals as *educational television* and *instructional television. Educational* programming is of the type that PBS would become most known for, an

[14] A kinescope is a film recording of a television program made by pointing a film camera at a video monitor during broadcast.

alternative to televised commercial entertainment which focuses on public affairs, children's programming, literary dramas and coverage of the nation's arts and culture. In other words, *educational* programming is not intended for formal instruction. On the other hand, formal instruction is the very function of *instructional* programming. Unlike *educational* programming, i*nstructional* programming is arranged in a series to assist cumulative learning; it is most often planned by or in consultation with educational professionals; it is often accompanied by other instructional materials such as primary reading, textbooks and study guides; it is often evaluated by education professionals for its effectiveness in learning; and finally, it is often offered for credit via an educational institution.[15]

By the late 1960s, the moniker of "educational television" would come to denote PBS style "public television," or *educational* programming. But in the early to late 1950s, educational television, to a large degree, meant instructional television. By 1959, for instance, though there were already many *educational* programs, fifty-three percent of all programming broadcast from educational stations was instructional in nature, or lecture-oriented, and forty-one percent of all programming consisted of for-credit telecourses.[16] In the early-to-mid 1950s *educational* programming--children's programs, cultural affairs shows and talking-head television--was harder to come by. "Programming for educational stations developed on a trial and error basis," Paul Saettler asserts in *The Evolution of American Educational Technology*, "Many stations began broadcasting without any plans for programs. In the early years of educational television, it was not unusual for stations to carry programs that had been put together a few hours before

[15] The first four of these five characteristics for instructional television are offered by David Hawkridge and John Robinson in *Organizing Educational Broadcasting*. London: UNESCO Press, 1982. Pg. 25.

[16] in 1959; The Impact of Educational Television, Wilbur Schramm 1961 ed vol

broadcast time."[17] It was easier for educational television stations--even those not associated with educational institutions--to hit the ground running with instructional programming since it already had an established content and format, the lecture. Most educational television stations in the 1950s were associated with educational institutions. After all, the chief reason for the instructional character of so much educational television in the 1950s was the massive institutional demand for alternative means of instruction, itself the result of critical teacher shortages and the Sputnik-inspired curriculum crisis (see below). As a result, the first decade of educational television in the United States was dominated by professional educators--k-12 and higher education administrators, professors, teachers and education scholars.

The first two educational television stations in the United States, for instance, KHUT and KHTE, both established in 1953, were owned by educational institutions--the University of Houston and the University of Southern California, respectively. Both aired for-credit instructional programming. The first three educational stations in the United States were in fact owned by universities and by 1955, 8 of the eleven existing stations were university owned. By 1961, of the 63 stations in existence, 22 were owned by intuitions of higher education, 19 by community corporations for k-12 broadcasting and 5 were run by state authorities also for public education (K-12). In addition, by 1959 there were also 133 closed-circuit television systems in use by 119 educational institutions in forty states.[18] Finally, there was the Midwest Program of Airborne Television Instruction (MPATI), established in 1959 (in conjunction with Purdue University) whereby a combination television stations and circling airplanes broadcast courses to

[17] Saettler, Paul. *The Evolution of American Educational Technology*. Englewood, Colorado: Libraries Unlimited, Inc., 1990. Pg. 365.

[18] Bretz, Rudy. *Educational-Instructional Television and Closed Circuit TV: A Manual, Directory and Bibliography*. Los Angeles: National Institute of Leadership, 1959. Pp. 4.

2,000 schools and an estimated 400,000 students in 6 states. By 1961 over a million students were receiving some kind of formal instruction via television.

Telecourses could function in a number of ways. With closed-circuit systems, students gathered in multiple classrooms or lecture halls to view instruction broadcast from either another classroom or a studio somewhere on campus. Tests would be taken in the rooms where students viewed their lectures. In some cases, two-way communication was set up so the instructor could field questions from students in the multiple classrooms. In higher education, the first full scale use of a closed-circuit system for instruction was operated by Pennsylvania State University at University Park. In the 1954-55 academic year, the institution offered three classes--two in psychology and one in chemistry--as closed circuit telecourses. The following year, they offered fifteen such classes, in sociology, psychology, economics, air science, accounting, music appreciation and metrology. Forty-two hundred students in total were enrolled in telecourses that year. So confident was Pennsylvania State in the future of television teaching in higher education that by 1957, the year of their first report to the American Council of Education, they were in the process of wiring the entire campus for closed circuit and broadcast television.[19] In the case of open-circuit, or over-the-air, broadcasting, students could be assigned to classrooms to view instruction. But for the most part, administrators saw instructional television as a solution to, among other things, space shortages on campus. Thus most over-the-air telecourses at the college and university level were viewed at home or in the dorm. Homework was turned into offices or by mail. In many cases, students were assigned a classroom for tests and the final.

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[19] Adams, C. John, C. R. Carpenter, Dorothy R. Smith. Eds. *College Teaching by Television: Report of a Conference Sponsored Jointly by the Committee on Television of the American Council on Education and the Pennsylvania State University at University Park, Pennsylvania, October 20-23, 1957*. Washington, D.C.: American Council on Education, 1958. Pg. 5.

At the elementary and secondary level, students would typically go to a classroom set up with a television for a given period or subject or a television would be wheeled into their classroom. In smaller systems, instruction would be broadcast by closed-circuit from another classroom or studio at the same school. In larger systems, instruction was broadcast either by closed-circuit or via a local educational television station to all schools in a given school district. The first such systems appeared in 1955 when both Pittsburgh, Pennsylvania and St. Louis, Missouri began television lessons broadcast from local stations. In the first year of broadcast in Pittsburgh, 639 5th graders from twenty separate schools in and around the city sat down five days a week to watch three half hour lessons in reading, arithmetic and French. By the second year, 1400 more students were added to the roster as was a lesson in 5th grade social studies and a high school course in physics thought by a University of California physics professor. By the third year new courses in 6th grade reading, 7th grade English, 9th grade general science and two additional courses in French were added. Nineteen fifty-five also saw the first state-wide educational television network established in Alabama. Set up in an effort to raise the standard of instruction throughout the state, a total of three stations, WAIZ, WBIQ and WCIQ, transmitted telecourses to 158,000 students at the elementary and secondary level. The Alabama system represented a higher level of infrastructural commitment to television teaching than in the

Figure 1.1 Biology teacher giving a lecture on TV, 1956.


Figure 1.2 Props and posters used at an educational television studio, 1956.


Figure 1.3 History teacher illustrating the balance of trade between England and the colonies, 1956.


Figure 1.4 Teaching U.S. government, 1956.


Figure 1.5 Principles of sculpture, 1956.


Figure 1.6 English teacher illustrating sentence structure, 1956.

Pittsburgh system, a level of commitment more representative of systems built in the later 50s and early 60s. In Pittsburgh schools, televisions were added to traditional classrooms, often wheeled in just before broadcast time. The Alabama system employed newly constructed experimental classrooms which functionally centered on the television. Students went to these classrooms to take lessons in French, Spanish, reading, social science, physical science, mathematics, art and music.

Historically, instructional television was the latest extension of "visual instruction" in American education. "Visual instruction," or sometimes "visual education," essentially denotes the use of visual aids in formal instruction with the express purpose of providing students with a concrete visual experience for a given situation, theory or concept. From the beginning, the dominant theoretical rationale behind visual instruction has been the idea that while certain concepts are more amenable to the type of abstract descriptions provided by language others require concrete visual experience to grasp. The leading theoretical justifications for visual instruction, those around which the movement has always rallied, all employ a "concreteness in education" thesis and specify spectrums, from abstract to concrete, along which all forms of instruction and experience lie. Thus in 1928, 1937 and 1946, Joseph Weber, Charles Hoban and Edgar Dale, respectively, all defined a range of teaching materials along such a spectrum with verbal description at one end, field trips on the other, and models, films, stereographs and slides somewhere in the middle.[20] "We can acquire visual experience from situations that are as concrete as reality and as abstract as the scheme of typical visual aids which follows," Joseph Weber wrote in 1928, "(1) actual reality, as we find it on a school journey; (2) pseudo-reality, as

[20] Weber, Joseph. "Picture Values in Education," *The Educational Screen*, 1928; Hoban, Charles et al. *Visualizing the Curriculum*. New York: Dryden Press, 1937; Dale, Edgar. *Audiovisual Methods in Teaching*. New York: Dryden Press, 1946.

exemplified by artificial models and exhibits (3) pictorial realism, as depicted in drawings and photographs; (4) pictorial symbolism--similes, metaphors, and plain language."[21]

While it was not uncommon for educators in the 19th century to employ maps, graphs, pictures or models in the classroom it was not until the introduction of the stereoscope, the advent of film and the establishment of a more perfected and accessible process for photography at the turn of the 20th century that a determined block of educators began calling for the concerted and extensive use of visual aids in education. Still, the movement did not begin in earnest until the 1920s, a decade of wide but dispersed growth for advocates of visual instruction. From 1919 to 1923, five separate national organizations emerged--the National Academy for Visual Instruction (1919), the American Educational Motion Picture Association (1919), the National Academy of Visual Instruction (1920), the Visual Instruction Association of America (1922) and the National Education Association's Department of Visual Instruction (1923)--each in an effort to promote and facilitate visual instruction.

The first national survey of visual instruction methods, materials and equipment conducted in 1923 provides an effective cross-section of visual education in these years. In that year the National Education Association decided to take stock of the use of visual aids in the nation's classrooms, appointing a committee to assess the state of the art in visual instruction methods. The committee conducted a survey of sixteen cities with departments of visual instruction to determine the types and amount of visual materials and equipment in use.[22] They found the sixteen departments to own a combined total of 686 projectors, 1,642 stereopticons, 236,884 slides and 268,072 stereographs. In addition, eleven departments had established film

[21] Weber, Joseph. Ibid. Pg. 126.

[22] The sixteen cities were Chicago, Newark, Detroit, Kansas City, Pittsburg, Los Angeles, New York, Atlanta, Berkeley, Buffalo, Philadelphia, Indianapolis, Toledo, Washington, Birmingham and Oakland.

libraries which contained a total of 1,755 reels of film. The survey also found that departments were not limited to the materials they owned. Many had set up distribution networks--circuits--through which materials, mostly films, would circulate from city to city.

In 1932 the three remaining national organizations merged into the National Education Association's Department of Visual Instruction (DVI); in the same year, the *Educational Screen*, the official organ of the NEA's department of visual instruction absorbed its only large-scale competitor, *Visual Instruction News*. Thus began a period of consolidated effort to centralize information and discussion regarding visual instruction, centrally coordinate the distribution of visual materials and equipment and promote and standardize courses for visual instruction in teacher education. The 1930s saw the first national conferences for visual instruction, a rapid rise of books published on the subject, especially handbooks and textbooks, and a number of states requiring courses in visual instruction for teacher certification.

At the heart of the visual instruction movement from the 1920s forward was the educational film, and WWII put a version of it--the training film--on the map for educators everywhere. The Second World War created an immediate demand for the rapid and effective training of soldiers and supporting personal for combat operations and for a myriad of technical and procedural duties. With the help of the U.S. Office of Education's new Division of Visual Aids for War Training, leaders in the field of visual instruction suddenly found themselves at the heart of a booming wartime training-film production--films that ranged from how to dress and how to behave on leave to lessons on the rapid assembly of weapons and the flying of airplanes. After the war, educational films hit the nation's classrooms in earnest, and the visual education movement found itself on more solid footing. Film use in the classroom, and visual materials

more generally, were seen less as a luxury and more as a compelling way to transmit certain types of information.

Thus, in some ways the preponderance of educational and instructional films during and after the war was a necessary precursor to educational television. They demonstrated the effectiveness of screen-based moving-pictures for formal instruction. And in a few cases, educational television stations did meet some of the demand for on-air hours early on by broadcasting educational films.[23] At the same time, instructional films differed considerably from the nature of instructional programming on educational television. Educational films were primarily documentary-narrative or training-oriented in nature. Instructional television programming was instead based on the style and conventions of formal education--on the lecture. At the same time, instructional programming was in some ways the culmination of visual education. It was the ultimate--or meta--visual aid. Instructional television allowed educators to employ any and all other visual media--especially film--at the exact moment when they became most useful or appropriate in their lecture. Many educators found early on that such a multimedia method proved the best way to maintain students' interests in instruction on a fundamentally visual medium. A lecture could be broken up in infinite ways. Science teachers broke up their demonstrations of laboratory experiments with film segments showing the micro processes involved at key junctures. English teachers compared the audio of various readings of particular

[23] Films were broadcast over live television via a process called "telecine." In the simplest set-up, a film projector was situated at a right angle from a broadcasting television camera; between them a mirror was positioned (and sometimes treated) to invert the projected image picked up by the T.V. camera. Because there was a difference in the frame rates for each medium (film at 24 frames a second and television at 25 or 30), the film was either sped up slightly, or select frames from the film were repeated. More complex systems called "film chains," used in educational broadcasting, contained a television camera positioned next to multiple film and/or slide projectors; in the middle a network of mirrors (a multiplexer) was used to select the "channel" of transmission.

passages, showed clips from stage productions and even demonstrated how to print on papyrus. For those willing to experiment, instructional television was truly multimedia.

Finally, instructional television must be seen within the overall context of 1950s American education. From the beginning, "television teaching" was hailed as the greatest, and in some cases only, solution to a series of educational crises which came to pass in the second half of the 1950s. The first concerned a severe teacher shortage. In the mid-1950s the first wave of children born just after WWII were coming of school age creating an immediate teacher shortage in lower k-6 grades and the likely prospect of an analogous shortage in grades 7-12 in the coming years. By 1958 k-12 classrooms across the nation would house 2.3 million students in excess of "normal capacity." In these same years, enrollment in institutions of higher education swelled from 2.6 million in 1955 to 3.6 million in 1960. For k-12, television teaching offered the opportunity to bring one instructor into many classrooms. For colleges and universities instructional television when broadcast from local stations solved not only their shortage of qualified instructors, but the additional shortage of space since enrolled students could watch lectures from home.

For advocates of television teaching, the new medium was more than a means for keeping the educational system from collapse. It was also a means to raise the standard of instruction in very specific ways. In 1957 the National Defense Education Act put into language and law the shared concerns of politicians and professional educators across the nation. In general terms the 1957 Act sought to elevate the level of education in America, to bolster the ranks of the technical elite and at the same time create a more educated citizenry, one capable of leadership on the world stage. But more specifically, the Act responded to the widespread belief, especially after Sputnik, that the deplorable state of instruction in core academic subjects--

especially math science and foreign language--made it difficult if not impossible for the United States to keep up with the Soviet Union. The second educational crisis of the 1950s amounted to concerns over national security. Charles Siepman, long-time advocate of educational broadcasting and author of *TV and Our School Crisis*, encapsulated the sentiment this way:

> The arithmetic of our plight is clear. We face a certain and rapid decline in the already diluted standards of education, and it needs little imagination to anticipate the consequences to the welfare of a society demanding more of its citizens--in wisdom, knowledge and multifarious skills--than was ever asked of any nation in history. Should we be short of imagination, the challenge of the U.S.S.R. offers a rude awakening ... there, engineers graduating from higher institutions increased from 28,000 in 1950 to 63,000 in 1955 while in these United States the number of such graduates plummeted from 52,000 to 23,000.

Television teaching provided a ready solution once again. For this reason, Title VIII of the Act provided 18 million dollars for research and experimentation in effective uses for television, radio and other audiovisual mediums for educational purposes. On the one hand, television teaching was an answer to the problem of qualified teachers in these key areas, especially science. On the other hand, critics and reformers called on scholars in the nation's colleges and universities to get more involved in the improvement of k-12 education, and instructional television offered them a way to do so. Foreign language instruction for instance, was thought to profit uniquely academic involvement (more on science instruction below). "FLES' [Foreign Language for Elementary School] greatest weakness has been its lack of qualified instructors," a

French instructor writing in *Yale French Studies* argued, "The aural-oral approach on which most FLES teaching is based requires of the teacher an understanding very different from that which may be acquired from a high school or college text. The texture and fiber of a language prove to be of a different nature. [Instructors] must come, therefore, from institutions of higher learning ... Because of this, television which permits one teacher to reach a large number of pupils suggests itself as a solution."[24]

## III. Instructional Television and Mass Higher Education: The Sciences versus the Humanities

Educational television arrived on the scene at a time when humanists felt increasing pressure to compete with science and technology, and in general, to prove their worth in an era of mass education. Because industrial society encourages the acquisition of technical skills and practical knowledge, sustaining an interest in humanistic studies and preserving a secure place for it in higher education had, according to contemporary practitioners, proved a serious challenge at least since the turn of the 20th century. The latest instantiation of this challenge had begun in the years immediately following World War II with the Servicemen's Readjustment Act of 1944. Known colloquially as the GI Bill, it ushered in what has since become known as the era of mass higher education. The benefits from the Bill were quite robust, leading many to take advantage. The Bill offered tuition, unemployment insurance, medical care and stipends for books and other student expenses to any veteran enrolled in an educational program. Anyone

[24] Kern Edith. "The Television Teacher - How Near, How Far?," *Yale French Studies*, No. 22. (1958), pp. 122-23.

serving for at least ninety days was awarded one full year of such benefits. Following that, each month of service yielded a month of benefits. From 1945-51 nearly one half of the 15 million returning veterans participated in the program; 29% attending college, others using their benefits to pursue degrees at vocational schools and obtain on-the-job training. College and university enrollments swelled with veterans, many doubling from 1944-46.[25]

Humanists had their concerns about the changing nature of higher education. Many became openly nostalgic for a pre-war campus populated only by "traditional students." GIs were after all a new breed of undergraduate. They were often in a hurry to finish their education, participating in campus activities at a much lower frequency than others in their cohort. They were practical minded and enrolled largely in institutions or courses teaching employable fields—business administration and engineering foremost among them. And ultimately, at least in the minds of many educators, they were little interested in using the elements of a classical curriculum to work through the mysteries of the human condition or to fashion a philosophy of life for themselves. To many humanists, GIs represented a massive influx of students for whom higher education meant attaining technical literacy or mastery and not maintaining man's cultural heritage. For some, these fears reached beyond the implications of the GI Bill to concerns over the potentially accessible nature of post war higher education in general. Returning veterans were one thing; they were expected to keep their heads down and finish their degrees in time to enter

[25] Kiester, Edwin, Jr. "The G.I. Bill May Be the Best Deal Ever Make by Uncle Sam," Smithsonian 25 (November 1994); Cohen, Arthur M. *The Shaping of American Higher Education: Emergence and Growth of the Contemporary System*. San Francisco: Jossey-Bass Publishers, 1998; Thelin, John R. *A History of American Higher Education*. Baltimore: Johns Hopkins University Press, 2004.

the work force. But already there was a nation-wide movement to extend the spirit of the GI Bill to a new generation of American students, of radically expanding the access and affordability of higher education. And already cries could be heard emanating from literature and philosophy departments across the nation to the effect that colleges and universities had dangerously opened their doors to the population at large—the very same general population who had always shown a wicked indifference to the subjects of the humanities.[26] "State universities as well as private colleges should have the right to select their students and not open their doors to all comers," wrote Douglas Bush, professor of English at Harvard University in 1957. Why? Because, according to Bush, the massive influx of average students—the "unintellectual," as he called them—had forced colleges and universities to "water down [their] curriculum" as well as "put in any kind of occupation or entertainment."[27]

According to Bush, students storming the gates of higher education now were those given over to mass entertainment, not the literary experience: "Only the exceptional students [entering college] have read anything that matters; as a nation, we are not given to reading books." Thus,

[26] If the post-war character of higher education placed the humanities in an ambiguous position the war itself motivated many to make the case that a humanistic education was more imperative than ever before. After all, the war was fought against an enemy whose very nature demonstrated the danger of taking civilization and culture for granted. The Nazi war machine, advocates of the humanities made the claim, could only develop in a society whose university system had so abandoned the teaching of culture and values for that of technical expertise. The scientistic barbarism of the Germans during the war and the moral susceptibility of the Nazi youth in particular were pointed to as products of teaching highly specialized knowledge instead of imparting critical intelligence.[26] Thus, Ernest Martin Hopkins, president of Dartmouth could conclude, "It would be a tragic paradox if, as a result of the war, we were to allow our system of higher education to be transformed into the type of education which has made it so easy for a crowd of governmental gangsters like Hitler's outfit to commandeer a whole population."

[27] Bush, Douglas. "First of Two Views...: The End of Education," *The Phi Delta Kappan*, Vol. 38, No. 5, Raising Hob with the Status Quo. A Special IssueDevoted to Problems of Higher Education in a Period of Rapid Growth (Feb., 1957); 165.

for some humanists, the inclusion of whole new sectors of society into the college and university experience was intimately related to the rise of educational television. Mass education—that is, education for the masses—meant education as mass entertainment: both appealed to the lowest common denominator; both meant a move away from the printed page; both were damaging to the humanities. From the beginning, select humanist constituted a core of outrage over the threat of television teaching. So much so that James Finn[28], USC professor of education and perhaps the most prominent figure in the field of educational technology throughout the 1950s and 60s, published numerous articles devoted to explicating the terms of the conflict between what he called the "literary tradition" and the "audio-visual tradition."[29] At the heart of the conflict, as Finn acknowledged, was a tradition of cultural hierarchy.[30] Among humanists, especially literary scholars, resistance to the inclusion of visual instruction or television teaching into education in the 1940s and 1950s, was in large part, just one front in a larger battle over mass culture. For Joseph Wood Krutch, professor of English at Columbia University and perhaps the most vocal opponent of television teaching, and of visual education generally, the educational arena--and especially its humanistic component--was the final bulwark against the cultural tendencies of the

[28] James D. Finn (1915-1969) was professor of education at the University of Southern California from 1949-1969. He published over one hundred articles on educational technology in his career, was the director of numerous national studies on the topic and co-author of the field's organizing document in 1963, "Guidelines for the Assessment of the Unique Educational Potentials of the Various Media: A Report to U.S. Office of Education." He was founder and senior editor of the field's central publication, *Audio-Visual Communication Review* and president of the Association for Educational Communications and Technology, Educational Media Council, and the National Education Association in the early '60s. He also founded the nation's first Instructional Technology Department at USC in the late 1950s.

[29] Finn, James. "A Look at the Future of AV Communication," *Audio Visual Communication Review*, Vol. 3, No. 4 (Fall, 1955); "The Sound and the Fury of Rudolf Flesch," *Teaching Tools*, Vol. 2, No. 3 (Spring 1955); "Some notes for an Essay on Griswold and Reading," *Audio Visual Communication Review*, Vol. 7, No. 2 (Spring, 1959);"The Tradition and the Iron mask," Keynote Address, Department of Audio-Visual Instruction Convention, National Education Association. Miami Beach, April 24, 1961.

[30]"The Tradition and the Iron mask," Pg. 8.

modern world. The introduction of audio-visual elements into the classroom, according to Krutch, amounted to the wholesale infiltration of mass entertainment--its amusing, catchy and effortless content--into education.

> Are what our school principals grandly call 'audio-visual aids' usually anything more than concessions to the pupils unwillingness to make that effort of attention necessary to read a text or listen to a teacher's exposition? ...How often can it be said that any movie, film strip, or recording teaches the so-called student--who has dwindled into mere listener or viewer--more than could be learned in the same time with a little effort, or that the mechanical method has any virtue other than the fact that such effort is not required?

For many educators, Krutch included, the new inclusive nature of higher education--mass higher education--made the introduction of mass culture even more problematic. The influx of students into colleges and universities, principally the result of the GI bill, forced educators to cater to a new lowest common denominator in student proficiency and expectation. Krutch called it an extension of the welfare state into education. Jacques Barzun, in his 1958 *The House of Intellect*, called it philanthropy, and designated it as one of three phenomena responsible for the rapid decline in American education and intellectuality. The expansion of higher education was problematic enough, these authors seemed to indicate, but the introduction of television programming into the classroom threatened to bring *their* culture in tow with them--to potentially take away the slow work of contemplative engagement with difficult materials and replace it with the principle of the advertiser's jingle.

Thus, at stake too was a surrender to the efficacy of a new communications technology, a surrender, as Krutch put it, to the mass delusion that mechanical techniques of communication are inherently superior and "interesting in themselves."[31] Scholars like Krutch and Barzun repeatedly chastised educators who had become obsessed with new modes of communication beyond the printed page. "The grand question has now become," Krutch averred, "whether or not the new techniques of mass communication inevitably and by their very nature weaken the power to learn at the same time that they make being taught so easy." For Alfred Whitney Griswold, historian, president of Yale and another vocal opponent of the audio-visual tradition, mass communications, oriented as they were toward a uni-directional mode of information transmission, was the killer of conversation in modern society and its introduction into education was anathema to the intellectual dialogue which sustained Western culture. Speaking at the 1954-1955 opening convention for Brown University, Griswold, addressed television in education specifically, ridiculing the new scholarly focus on communication. "The freshman reads on in despair." Griswold sarcastically anticipated the near future, "He is looking for a course in English. He can't find one. He goes to the Dean. 'English?' says the Dean. 'Oh we don't bother with that anymore. We have developed more effective means of communication."

The phrase, "more effective means of communication," is telling here. Many of those resisting the introduction of the television into education seemed to be acting on a shared fear concerning the magnetic nature of television as a source of entertainment and information, especially when compared to the conventional codex. The fact is, television did not just compete with quality print culture by offering easily digestible mass entertainment. As a vivid, dynamic and intimate interface for information, it also contested the efficacy of print, a fact expressly

[31] Ibid. Krutch. Pg. 134.

articulated by educational television advocates and at least implicitly acknowledged by its detractors. One catches a glimpse of such anxiety, not just in statements like the one above but also, for instance, when scholars warned that education via television could compel students to stop gathering information from multiple sources, relying solely on the television for information about the world. Content emanating from the television screen was abnormally compelling, detractors seemed to indicate. As studies had shown, people often took its content to be true without question. Thus, instructional material via the television screen threatened to subvert traditional book-based forms of information gathering, not just by encouraging passivity in the learner but because its vivid content had such a definitive air to it. "The city of Chicago prides itself on the number of hours weekly spent on each course before the TV screen," wrote Robert Nossen, in advising English professors on how best to influence the new educational medium, "This is the height of ridiculousness ... the student must learn from books." Telecourses, Nossen went on, must "demand the discipline of library searching: to collect materials, to analyze them, to collate them, and to conclude from them." Information in books began conversations, Nossen and others suggested; books opened inquiry. Students go from one book to another and then another, seeking out connections and related knowledge. Not only was it hard to do this with television, but because information emanating from the screen was felt to be so conclusive, the new medium simply didn't encourage such intellectual activity either. These conflicts between the printed word and television--between print and electronic culture-- led James Finn to articulate a hypothetical manifesto of the literary tradition this way: "There is but one God and it is the Word; there is but one human and he is the man with literary sensibility; there is but one

world, and it has been printed on a press for all to see. Everything else is either a false God, an inhuman man, or a phantom world."[32]

## IV. Instructional Television and the Educational Crisis

While some, like Joseph Krutch, resisted entirely the incursion of educational television into the realm of higher education and into the sacred realms of humanities instruction, in particular, other humanists found in television their best chance to keep up with curriculum reform in the 1950s, and specifically a way to compete with science and technology.

With the rise of instructional television, a real sense of urgency registered among humanists that if they themselves did not find a use for the new medium, one would be found for them. This particular sense of urgency would continue to haunt many humanists up into the 1970s, triggered again and again with the introduction of each new technology into the arena of education. With television teaching in particular, it seemed clear that the basic conditions which made it appear so attractive, even necessary, to administrators across the nation--the dramatic rise in enrollments--would only continue into the next decade. Thus in a very basic sense, television teaching wasn't going anywhere, and many expressed a kind of "if you can't lick 'em, join 'em" attitude. "The medium of TV is with us," wrote the chair of the English department at Lamar State College in 1958, "English teachers must face the reality; they must experiment, must search for answers. Otherwise, inevitably, ready-made answers will be found for them."[33]

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[32] Finn. Ibid.

[33] Nossen, Robert. "TV and the Teaching of English," *Improving College and University Teaching*, Vol. 6, No. 3 (Summer, 1958). Pg. 98.

But 'joining 'em" meant more than just throwing traditional lecture content onto a screen. Part of the pressure to keep up--to "experiment [and] search for answers"--was a sense that every other discipline was busy narrowing in on its particular suitability to television teaching. With the rise of instructional television came extensive experimentation within each discipline with the character of the new medium. In nearly every field, teachers, scholars and administrators sought to find the ways in which their particular subject matter and traditional pedagogical institutions could be made amenable to television instruction. Again and again one sees a working out of how best to take advantage of television's capacity for visual instruction--how, practitioners from countless fields wondered, does the realism and immediacy of the moving image in general, or the close-up, superimposition and split-screen, in particular, relate to our subject matter. Advocates for television teaching always found their niche: in psychology, real-time abnormal behavior could be scrutinized by students; in education would-be teachers could see how best to perform in front of a classroom; in medicine students could gain an intimate view of surgical techniques as cameras were brought into operating rooms; even in mathematics, complex and abstract concepts could be demonstrated by turning to "dynamic cartoons" in the middle of lectures. Put another way, in nearly every field one could find advocates for television teaching asserting that students who encountered their subject as a telecourse or in a lecture supplemented by television got more than their counterparts in conventional classrooms.

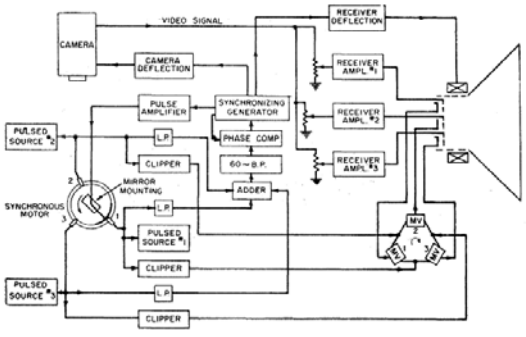


Figure 1.7. Block diagram of television color-translating microscope at Rockefeller Institute for Medical Research. Source: V.K. Zworykin and Fred L. Hatke. "Ultraviolet Television Color-Translating Microscope," *Science*, Vol. 126, No. 3278 (Oct. 25, 1957). Pg. 808.

Thus in most fields, just as with English, there was a sense that the discipline would have

to find its distinctive relationship to the character of television in order to keep up with advances in education. But among English scholars, enthusiasm for such an undertaking more often appeared alongside anxiety that their hand was being forced. Put another way, in flourishing fields--in psychology and biology, for example--experimentation with instructional television was more often linked to an overall robust enthusiasm regarding potential new frontiers in the field. That is, television was more often seen as a new device whose research and teaching methods would organically take their place within an already developing field. In psychology for instance, closed-circuit television used both to broadcast therapeutic lessons to inmates and observe round-the-clock behavior took its place among a larger boon of successful experimentation in new drugs and treatments in the 1950s.[34] The former in particular--"therapy by television"--was born of cutting-edge work in psycho-cybernetics which pushed communications theory to the center of diagnosis and inter-personal communications to the center of healthy mental behavior. The mentally ill respond well to frequent encounters with television, advocates argued, because "communication is the matrix in which all human activities are embedded."[35] In biology the use of color television proved a fruitful area of experimentation in the mid-to-late 1950s. Simultaneous manipulation of the color wheel on a camera and monitor allowed investigators to track chemical data in specimens not available by direct photography. The ultraviolet television color-translating microscopes--an ultraviolet microscope hooked up to a color television via a number of amplifiers, pulse clippers and phase comparators--developed

[34] Martin, Lee Gaither and Charles H. R. "Therapy by Television," *Audio Visual Communication Review*, Vol. 4, No. 2 (Spring, 1956); Tucker, Hyman; Lewis, Richard; Martin, Lee Gaither and Over, Charles. *Television Therapy: The Effectiveness of Closed Circuit Television as a Medium for Therapy in the Treatment of the Mentally Ill*. Agnews State Hospital, Agnew, California, 1955.

[35] Ruesch, Jurgen and Gregory Bateson. *Communication the Social Matrix of Psychiatry*. New York: W. W. Norton and Company, 1951. Pg. 13.

by the Rockefeller Institute for Medical Research and RCA Laboratories in the mid-1950s allowed biologists and medical researchers to observe specimens under ultraviolet conditions in real time. Prior to the new contraption, researchers had to develop each individual photograph in order to render the ultraviolet image visible.[36]

By contrast, in English, classroom television was more often seen as the medium by which teachers and scholars will be made to update the "talk and chalk" principles of yesteryear. None of this is to say that educational television was not greeted with great enthusiasm by some English scholars. It was, as I'll show below. It is simply to say that, it was more often the case in English that such enthusiasm was tempered by the suspicion--conscious or unconscious--that experimentation with instructional television was at least, in part, a response to the prevailing belief that the humanities were, unlike fields like psychology or biology, on a decline. Experimentation with curricular reform always feels different on the way down than it does on the way up. The latter is exciting; the former stimulating but defensive. In 1956 Henry W. Knepler, professor of Language, Literature and Philosophy at Illinois Institute of technology, conducted interviews with 20 English professors for the National Council on Teachers of English's Committee on College English for Non-Major Students. The purpose of the interviews was to gauge reactions to the use of instructional television in their field. Knepler reported that most respondents believed the use of television in the classroom to be "inevitable." What's more, respondents' phrasing revealed the degree to which embracing television teaching in their field could be seen as exciting and defensive at the same time. "Since I belong to the school which

[36] Hovnanian, H. Philip  Holt, Roland B.  "Recent Developments in Color Translating Ultraviolet Microscopy," Medical Electronics. Vol. 7 (July 1956); V.K. Zworykin and Fred L. Hatke. "Ultraviolet Television Color-Translating Microscope," *Science*, Vol. 126, No. 3278 (Oct. 25, 1957); V. K. Zworykin and C. Berkley. "Ultraviolet Television Color-Translating Microscopy," *Annals of the New York Academy of Sciences*. Vol. 97, No. 2 (May 1962).

believes that if you can't lick 'em, join 'em," Professor Miller of the University of Nebraska responded to Knepler, "I believe we (English Departments) should lead the way." Edward W. Rosenheim, Professor of English Language & Literature at the University of Chicago, argued that the traditional lecture method could have a good deal to gain by television. At the same time he offered this: "Like their brethren of the Chautauqua platform and the vaudeville stage, the species is obsolescent, and unless their talents can be adapted to the demands of electronics, they had better seek a living elsewhere."[37]

What's more, when English scholars and teachers talked of 'joining 'em' or 'keeping up' in the realm of educational television, they had the sciences particularly in mind. If the ascent of mass higher education, and with it, the rise of educational television appeared to some to challenge the aims and values of humanities pedagogy, the sciences appeared to many to threaten the entire humanities enterprise. The vast techno-scientific output of the late 1950s and 1960s appeared threatening to the humanities on several fronts. On the one hand, interest in the humanities on the whole seemed to be at stake as the United States geared up for the space race, spending thousands of times more money each year on science and engineering research. On the other hand, humanists feared a loss of national leadership as they became increasingly cut off from a progressively hermetic scientific culture.

Unparalleled increases in the amount of funding for the sciences due to post-WWII national defense and the Cold War space race, as well as a downturns in humanities funding, signaled to many the declining importance of the humanities in a technology-gripped America. As a kind of quantitative marker many pointed to the funding within the National Science

[37] Rosenheim is quoted in Knepler, Henry. "English Via television," *College English*, Vol. 18, No. 1 (Oct., 1956). Pg. 7-8..

Foundation which had been established as early as 1950. It began in that year with $225,000 in monies, but immediately increased to a full 3.5 million the next year. In 1954 a cap on annual appropriations was lifted and by the early 1960s it was spending near a half a billion dollars annually.[38] By comparison the humanities were receiving somewhere near one percent of this figure. Already in 1952, George Borglum of Wayne State University, expressed irritation at the imbalance of power in the use of instructional film and television: "Must science explode in our face because our profession can't command the equivalent in dollars of one or two modern bombers per language for audio-visual materials?"[39] But such fears were only reified with the passage of the 1957 National Defense Education Act. The Act sought first and foremost to advance education in the sciences, a set of subjects thought to be especially emendable to television teaching, For this reason, Title VIII of the Act provided 18 million dollars for research and experimentation in effective uses for television, radio and other audiovisual mediums for educational purposes.

In 1959 C. P. Snow, famed English scientist and novelist, raised an issue already on the minds of many academics, assailing the growing breach between scientists and technologists on the one hand and humanists on the other. In a widely read work, *The Two Cultures*, Snow argued that the modern world's large-scale problems could not be properly solved while there existed no communication—and in fact much miscommunication—between the sciences, technology and the humanities. What Snow and others writing on the problem of the 'two cultures' failed to

[38] Keeney, Barnaby C. "The Humanities in American Society," *Proceedings of the American Philosophical Society*. (112; 1. Feb., 1968). Pp 4.

[39] Borglum, George. "Lest Science Explode in Our Face," *The Modern Language Journal*, Vol. 36, No. 7 (Nov., 1952). Pg. 315.

observe, at least explicitly, was the degree to which humanists appeared distraught over the fact that Cold War science and technology threatened to edge out literary, artistic and philosophic works as representing man's most significant contributions. The years after the War were self-designated by the press as the era of "Big Science," an era of nuclear energy and nuclear weapons, of rocketry and radar, and of computers and cybernetic machinery (all coming out of the war). 'Science' itself was continuously referred to in these years by employing the almost ubiquitous turn of phrase: "man's greatest achievement." In 1961, for example, *Time* magazine declared "the scientist" men of the year and described him as the greatest contributor to man's wellbeing in all of human history. "[They are] the true 20th century adventurers, the real intellectuals of the day," the magazine declared, "the leaders of mankind's greatest inquiry into the mysteries of ... life itself. Their work shapes the life of every human presently inhabiting the planet, and will influence the destiny of generations to come. Statesmen and savants, builders and even priests are their servants." Such assertions were made all the more real as humanists watched the rapid promotion and tenuring of scientists and technologists across campus and as they witnessed them become permanent advisors to Congress and the White House. "The literary man as spokesman and prophet doesn't stand very high today," Joseph Wood Krutch protested in 1958, "Any contemporary writing on 'Heroes and Hero Worship' would have to put the man of letters pretty far down on the list and the scientist as hero at the top."[40]

In this way, scientists and technologists threatened to eclipse humanists as the nation's leading intellectuals at the same time that science itself threatened to attain the status of something like "Culture." It wasn't enough that humanists due recognition was slipping or that

[40] Krutch, Joseph Wood. " If You Don't Mind My Saying So," *The American Scholar*, Vol. 27, No. 3 (Summer, 1958), pp. 365.

that science and engineering were now being acclaimed as true expressions of individual sensibility and imagination (a designation traditionally left to the arts and letters)[41], but Homer was everywhere being publically replaced by nuclear physics and genetics as the best examples of human greatness and as the best hope for a collective good life. In this context the 'two cultures' conflict was not just the most recent confrontation between advocates for a scientific or literary education and worldview—a replay of, or modern variation on, the debates between Samuel Taylor Coleridge and Jeremy Bentham in the 1830s, and between Mathew Arnold and T.H. Huxley in the 1890s, although it was this too. But it was also a continuation of humanists' warfare against the cultural handiwork of the modern industrial-scientific complex, a replay of T.S. Eliot and Van Wyck Brooks' early 20th century diatribes on the subject. Only now scientists and engineers took the place of industrialists and the purveyors of commercial mass culture. Homer, Chaucer and Plato had already taken a sound thrashing from the latter at the turn of the century. These great thinkers, and the humanists who studied them, had never regained the position of prestige held in the early-to-mid-19th century and now here again modern science and technology were offering up to the public another serious contender.

Just as with mass higher education, the threat the sciences posed for the humanities in these years was not unrelated to the rise of educational television. As a set of subjects, the sciences were thought to thrive in the arena of instructional television.

[41] Ernest Nagel recognized the shift in 1959, summarizing the older view as follows: "scientific inquiry is frequently believed to be a routine grubbing for facts, and unlike literature and the arts to require no powers of creative imagination." "The Place of Science in a Liberal Education," *Daedadlus*, (Winter 1959).

Instruction in the sciences was, many avered, especially suited to television teaching first because as a subject it called for "master teachers." Many educators proposed that instructional television allowed the best teachers to reach the widest audience possible, or put another way, it provided a new educational arena in which the best teachers--the "master teachers"-- were no longer limited to the same number of students as mediocre instructors. In general, this advantage was hailed as yet another potential boon to education at a time of perceived crisis in the quality and quantity of instruction. By "master teachers" advocates for television teaching had in mind both teachers who had proved themselves exceptional instructors in the classroom and those who were superiorly trained in a given subject. Thus instructional television made it possible that a local English teacher in Providence, Road Island who was exceptional at communicating with students could be picked up by an educational television network and broadcast to hundreds of thousands of students. It also made it possible for cutting edge scientists to teach physics courses to high school students, and in general for university professors who kept pace with new developments in rapidly advancing fields to reach a k-12 audience.

The ability to broadcast lectures was especially critical for science instruction in the late 1950s, where teacher shortage was particularly severe. The National Defense Education Act was not just a response to increased numbers of engineers in the U.S.S.R. but to the decreased number of qualified science teachers in America. After all, the number of engineers in the United States had also risen in the first half of the 1950s, but ironically, at the expense of science instruction. From 1950 to 1955 the supply of teachers in the sciences fell 58.7 per cent from 9,096 to a 3,754. "Industry invaded the campuses, not just to interview young men about to graduate, but to raid the college teaching staff as well," explained the author of the National Education Association's 1957 annual report on teacher supply and demand, "Small wonder that

high school offerings in the sciences and mathematics, about which there has been such lament, do not appear to be strong"[42] High school physics was the example everyone turned to. In 1955 48% of high schools in the United States had no physics course; they lacked a qualified instructor in the subject. In 1956-57 the city of Pittsburg solved this dilemma by hiring Professor Harvey E. White, chair of the physics department at the University of California at Berkeley to broadcast three lectures and two lab demonstrations a week. The telecourse was hailed as such a success in the educational community, the next year school systems across the nation signed up to use the kinescopes produced from the original broadcasts. Other school systems began employing their own professors from local universities.

Advocates of a televised science curriculum also seized on the potential star quality inherent in the medium. If America needed more science careers from the coming generation of junior high and high school students, they argued, what better way to convince those students of the glamour of the subject than by way of instruction from prestigious scientists. Time and again, they invoked the image of the cutting edge scientist speaking to thousands of students from his lab, animated with singular passion and enthusiasm for his subject." The guest scientist appearing on the television screen in the classroom is sharing his talents and experiences with the students." wrote Bess Barg, Radio-Television Assistant for Philadelphia Public Schools, "His interest in them, at

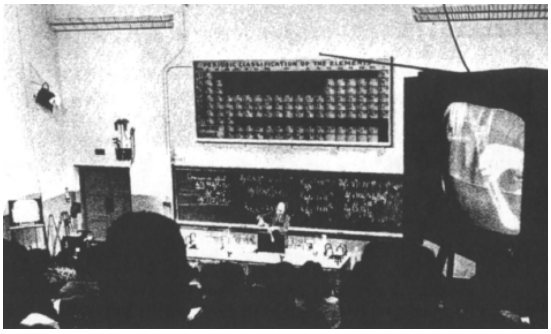

Figure 1.8. A course in chemistry at Pennsylvania State University, Spring 1956. A camera is used to televise demonstrations to six monitors along the walls of an auditorium. Source: L. P. Greenhill, C. R. Carpenter, W. S. Ray. "Further Studies of the Use of Television for University Teaching." Audio Visual Communication Review, Vol. 4, No. 3 (Summer, 1956). Pg. 206.

[42] Research Division, National Education Association, "The 1957 Teacher Supply and Demand Report," *Journal of Teacher Education*, Vol. 8, Number 17, 1957. Pg. 30.

that very moment, is evident in his every movement, his every word. He's alive and real and his concerns at the moment are their concerns. Their emotions as well as their minds are stirred."[43]

Finally, the very content of science instruction was thought to be especially suitable for television teaching. As a set of subjects the sciences tended to rely less on discussion and direct teacher-student exchange than did courses in the social sciences or humanities. What's more, the sciences, though frequently abstract, were also often fundamentally visual. They required more effective uses of demonstration materials--equipment, experiments, artifacts and specimens--a fact made evident not just through the character of telecourses in science but by the uses of the television as a visual aid in traditional science classrooms. In large auditoriums demonstrations, like the chemistry experiment in figure one, could be broadcast to back rows by flanking seated students with several monitors. "With TV each student has a front row seat!": ran a general anthem of television teaching, but one often invoked in regards to science instruction. The intimate, analytical and magnifying power of the camera and its related capacity to focus attention was thought to be especially compelling for science instruction. In biology, for instance, the camera could be directed towards the image in a microscope such that the entire class could witness the exact same processes at the exact same time. Science telecourses also took special advantage of another benefit of television teaching: objects that would be nearly impossible to get a hold of for multiple classrooms, once used in a single television lecture, could be broadcast to 1000s of students at once, or taped and broadcast endlessly. In science telecourses, rare artifacts and live specimens could be more easily studied. So too could complex experiments, rare apparatuses and hard-to-produce physical processes. Animals could be seen in their natural environment. "How else could one teach this course except by use of television?"

[43] Barg, Bess. "The Science Telecast in the Classroom." *Education*, Vol. 74, (October, 1953). Pg. 88.

quipped a university freshman regarding a televised course in zoology. Like the appearance of prominent scientists on the screen, this vivid nature of televised science instruction was argued to be a potential boon to the quantity of future science careers. "This is the age of science, an age when the welfare of the human race, its security and freedom, must depend in large part upon leadership in science." wrote Asa Knowles, president of the University of Toledo in 1958, "ETV if properly used opens new horizons both to motivate interest of youth in science and to enhance the effectiveness of science teaching."[44]

## V. "Television Teaching" in the English Classroom

Humanists, like Joseph Wood Krutch, who saw educational television as part and parcel of a movement towards mass higher education and as an consummate threat to the experience of the printed page resisted it outright; humanists who saw it as a way to keep up with curriculum reform geared towards the sciences, embraced it, if half-heartedly. Finally, there were humanists who saw educational television as a new realm of electronic culture, one which directly related to their traditional domains of authority and embraced it enthusiastically. On the one hand, embracing television allowed humanists the opportunity to work out the relationship between the new medium and the nature of print and in so doing, work out the nature of their role in an era of electronic culture. On the other hand, attempts to influence the overall nature of television programming and direct developing viewing habits in these years allowed humanists the opportunity, at least rhetorically, to shore up their relevancy by expanding the social responsibility of the humanities to include the guidance of new media.

[44] Asa Knowles. "TV and Science," *The High School Journal*, Vol. 41, No. 5, (Feb., 1958). Pg. 185.

Thus, just as there were forces pushing English professors and teachers into television teaching--the desire to keep up in a period of perceived decline for the humanities--so too there were forces pulling them in, qualities of television that had a unique allure to their traditional domain of authority. After all, arguments to the effect that English teachers and scholars had to get involved with television were also often bolstered by the belief that as specialists in language and communication they were particularly suited to lead the way. "Television, like the printed page, is not an intellectual discipline; it is only a medium of education," concluded Henry W. Knepler, at the end of his exposé on instructional television in English, "It can become a considerable educational force. It is up to us to take a hand in shaping it." What's more, the desire among English teachers to get involved in television as a medium was also connected to early optimism regarding the potential cultural benefits of television. First there was optimism regarding the potential quality of general television programming, especially literary dramas, an optimism that had faded by the early 1960s. Second, there was optimism regarding early perceptions of the character and function of television as a communications device. The existence of televisions in classrooms, indeed the idea of their potential omnipresence in spaces of instruction, led some educationists in the 1950s to hope that the coming generation could be convinced that the television screen was an electronic plane for information retrieval and analytical-somatic experience (even literary experience) as much as it was for entertainment. Such a notion was particularly attractive to those humanists who hoped to broaden their social relevancy, by creating a unity of experience between what went on in the classroom and what went on in the rest of the world. Arguing for the need for educational television in *The English Journal* in 1951, Lieber Anker, a high school English teacher in Metuchen, New Jersey brought these two elements of early optimism together: "TV or not TV is no longer the question.

Television is here to stay and certainly to improve the quality of its presentations. Now, while it is still cutting its teeth, teachers can grasp the opportunity to help their pupils appraise offerings intelligently and to realize that school has as much, if somewhat different, to offer in the way of meaningful experiences."[45]

The fact is literary scholars and teachers of English had good reason to be optimistic about the quality of television in the immediate postwar years. The late 1940s and 1950s constitute what media scholars and critics have since referred to as the "Golden Age of Television." From the Spring of 1947, when NBC launched *Kraft Television Theater*, to roughly 1960, when television production abruptly shifted from New York City to Hollywood, primetime television drama essentially emanated from New York theater houses. "It is a foregone conclusion that we are never again to witness so splendorous and flourishing a time for drama over American airwaves," wrote Larry James Gianakos, a television historian with typical scholarly nostalgia.[46]

Television networks that came on air just after WWII were required by the FCC to provide twenty-eight hours of programming. Networks scrambled to put together shows, filling those hours with whatever they could--variety shows, game shows and westerns, but also wrestling matches, roller-skating derbies and parlor games. At the same time, network executives sought to attract more esteemed sponsors in these early years and in general sought to improve the public's estimation of television as a cultural medium--partly in response to the second-rate quality of much early programming. Live television dramas met both challenges. Starting in the late 1940s, television adaptations of contemporary plays formed a convenient and ready supply

[45] Anker, Lieber. "Television, Here I Come!," *The English Journal*, Vol. 40, No. 4 (Apr., 1951). Pg. 219.

[46] Gianakos, Larry James. Television Drama Series Programming: A Comprehensive Guide, 1947-1979. Metuchen, New Jersey: The Scarecrow Press Inc., 1980. Pg. xi.

of compelling dramatic stories to help fill the near endless electronic void of on-air hours. So too did adaptations of established literary works--plays, short stories, novels and even poems. In television's first decade, works from nearly every playwright in the Western canon were adapted for the new medium. But as the television genre matured in the early 1950s, on-air adaptations of contemporary and classical works were joined by high quality original compositions written specifically for television. The superior quality of these later works compelled many to declare the arrival of a new literary form--the fifty-two minute "teleplay." Thus in the 1955-56 season alone one could regularly see, among others, works by Sophocles, Euripides, Shaw, Ibsen, Faulkner, Tennessee Williams and Henry James. One could also see all of Shakespeare's major plays. When NBC presented a three hour version of Richard III on March 11 1956, it was viewed by one of the largest television audiences yet--25 million. Alongside these adaptations one could tune in each week to a new work by a critically acclaimed television playwright--Reginald Rose, Tad Mosel, Robert Alan Arthur, Rod Serling, Gore Vidal and Paddy Chayefsky. For producers, directors, playwrights and television executives, these were heady days: "We shall create the Great American Theater," declared Pat Weaver, president of NBC in 1955.

But confidence in the new medium was not limited to industry. Many literary scholars too were hopeful. Glibert Seldes was perhaps the most visible writer and critic to celebrate the cultural quality of the new medium. He is, likewise, the figure historians of television most often invoke when discussing the existence of positive critical reception for television in its early years. But support was much more widespread among the literary set than a focus on these few figures demonstrates. It reached into the deepest levels of the academy and into a extensive core of English teachers, both at the k-12 and the college and university level. In fact, embracing the new medium, and its potential "electronic renaissance" for particular literary forms, was thought

by more than one professor to be a potential boon for the humanities. As Patrick D. Hazard, professor of American Civilization at the University of Pennsylvania, indicated in 1956, television bestowed the rather serendipitous opportunity to shore up the value and relevancy of the humanities:

> The English department office is more and more the GHQ of a beleaguered army; dismal reports trickle in of a new foray from the Education department ...Enrollments dwindle, student calibre deteriorates, power and prestige diminish. How different all this could be! Instead of the gloomy headquarters of a war of attrition against plummeting standards, the English office could become a center for intelligent criticism of American popular culture. ... These two responsibilities-developing standards of criticism for popular culture and creating a vision of creativity within the popular art forms-are, in one man's opinion, the major tasks of the humanist in contemporary America.[47]

Academic support for quality television also reached beyond published scholarly discourse in journals. Throughout the 1950s a number of guides to television plays were published by popular presses, often edited or with introductions from academics. For instance, the Harcourt, Brace series, *Best Television Plays*, issued in 1950, 1954 and 1957 was conspicuously positioned as a popular endorsement of the television drama by the academy. The nominating committee for the series was comprised of over twenty-two university professors--

[47] Hazard, Patrick D. "Yes, but the Question Is How?" *College English*, Vol. 17, No. 4 (Jan., 1956); 234.

thirteen of them from English departments. The 1957 edition opened with this endorsement: "The very nature of this giant new industry, and its insatiable demand for fresh material--hour after hour, day after day, week after week--led inevitably to an enormous output of writing. The result was the discovery of fresh creative talents. The best writing by the television playwrights has achieved a quality that deserves general critical attention and assures it of a place in contemporary American literature."

Many scholars in fact held out the specific hope that television would generate a renaissance for the drama. The democratization of literature in cheap print throughout the 19th century had actually done the drama a disservice, many averred. It had made all literary genres more readily available--from novels and poetry to short stories and essays. But, for instance, while poetry's full aesthetic experience could be contained within its text, and while fiction was written to reside on the page, drama always sought its final and essential form in the dramatic act. With the expansion of print literature more and more people encountered drama in its more underdeveloped form, a reason many sighted for a flagging interest in plays. Radio and phonographs were thought to be a partial solution. But with the advent of television came a greater opportunity--an opportunity to bring quality drama to the general public, at home and in the classroom, and to reinvigorate an interest in drama--on T.V., in the theater and on the page--generally.

Thus English scholars and teachers were encouraged about new opportunities for literary experience via television, both in the new style of dramas unique to the medium--the teleplay--and in the increased availability of literary works in television adaptations. But their cultural interventions in, and encouragement of, the new electronic medium went beyond endorsements in scholarly and popular print. Their interventions often took place in the classroom. Getting a

new generation of students to watch, engage with and appreciate literary television was key in pushing this facet of the new medium forward. Sometimes these interventions were direct, like when teachers encouraged their students to write into networks and local stations in an effort to support quality programs. "The English teacher should take the lead in seeing that network executives receive encouragement when they do succeed in bringing great literature to life before their millions of watchers, " wrote James J. Brunstein, in a characteristic article from 1958, "Ten uses for Commercial Television in the English Classroom." But most often efforts to influence the cultural character of television--efforts mounted from the front of English classrooms--took the form of instilling critical television skills in the upcoming "T.V. generation"--selectivity, informed appreciation for superior work and dissatisfaction with narrative traits like "banality," "sensationalism," or "dishonesty."

English teachers employed a range of strategies. At the most basic level English teachers took on the responsibility of letting students know when quality programs would air--though there was considerable discussion about the most effective way to do so. Some simply made announcements in class or wrote the communiqué on their chalkboard. Others created special bulletin boards in their classrooms devoted to television programming. Neil Postman, in his *Television and the Teaching of English*, prepared for the National Council of Teachers of English's (NCTE) Committee on the Study of Television, reported one teacher who, in an effort to advertise the upcoming broadcast of *The Tempest*, created a montage of drawings, photographs and illustrative lines from the text and placed it on his bulletin board.[48] Still others organized student television committees whose job it was to keep their class up-to-date on soon

[48] Postman, Neil. *Television and the Teaching of English*. New York: Appleton-Century-Crofts, Inc., 1961. Pg. 79.

to air quality programs. On another level, English teachers tried to get their students to examine and critique television culture more broadly, creating unique assignments for their new charge. Some created writing assignments for, among other topics, "Television's most outstanding program," "The most Educational program on Television," "How Television Helps with School Work," and "How Television Advertisements Influence Me." Others tried to empower students by inviting them to play the imaginary role of television critic, having them coordinate, vote on and act out their own television award shows. Still others had students keep television logs of programs they watched with brief plot summaries and evaluations for each program.

But, by and large, the use of television in teaching English took two dominant forms: having students watch literary adaptations as a supplement to their print analog and having students watch original television dramas and then directing their curriculum towards an analysis of its form and content. On the most basic level getting students to engage both literary adaptations and original television plays was the most compelling way to encourage them to regularly seek out literary experiences via television and generally to start thinking of the electronic apparatus in their family room as a major vehicle for quality narrative culture.
But on another level, English teachers and scholars hoped for a kind of cultural cross fertilization in which certain aspects of T.V. watching could be transplanted into the act of reading while other, traditional aspects of quality textual engagement could be shifted to television viewing. By way of the first, English teachers hoped that watching literary adaptations would enliven and enrich students' experiences of classical works as they applied routine viewing practices to the superior narratives, character development and dialogue of those adaptations. Miriam Goldstein, a high school English teacher in Massachusetts, championed just this aspect of literary television, citing a student's revealing reaction to an educational series by the Council for a Television

Course in the Humanities for Secondary Schools: "Things aren't going right for Oedipus. Jocasta's trying to cheer him up, but watch his face as she tells him her story....And it's even worse when the messenger from Corinth brings him the 'good' news."[49] Here, the close-up of a distressed human face, so often employed in game shows, soap operas and elsewhere, was instead leveraged towards productive literary analysis. Miriam characterized her students' reactions generally along these lines, celebrating their "easy transition from TV as entertainment to TV as education." "The filmed lessons," she concluded, "had bridged the gap between what these boys and girls know as life and what they regard as a negation of life: the printed page."[50]

In the other direction, English teachers hoped and expected that getting students to watch literary adaptations and quality teleplays would help them to analyze the relationship between traditional literary forms and television and thus learn to apply established textual modes of evaluation to the new medium. With literary adaptations the link between the printed page and television was forged by asking the same or similar questions of both versions and in examining the nature of adaptation itself. How does one fit Moby Dick into two fifty-five minute programs? Why is Ishmael's story fourteen years later narrated instead of being acted out? In the televised version of Ibsen's *A Doll's House*, how does the camera take up the role of the narrator in establishing Nora as the central character? With original television programming, students were instructed to deploy traditional textual questions towards the new medium and in doing so link "the serious business of evaluating literature to the seemingly passive business of watching television."[51] Thus even bad television programming could aid in the appreciation of good

[49] Goldstein, Miriam. "Humanities through Television," *The English Journal*, Vol. 49, No. 4 (Apr., 1960); 252.

[50] Ibid. 255.

[51] Postman, 85.

literature, and thus ultimately, good television. In "Television and the Teaching of English" (not to be confused with Neil Postman's book of the same title) Erwin R. Steinberg, professor of English at Carnegie Institute of Technology, reported having his students examine the structure of T.V. westerns--how many minutes did it take for the good guys and bad guys to become clearly differentiated, how long until the central problem of the episode was clear, which side gained ascendancy first and how long into the program did the climax come? He then had his students write essays on the formal limitations of the medium which compelled a heavy reliance on stereotypes and trite structures. Finally, he had them read short stories by respected authors and then compare how "capable writers" dealt with the constraints differently--that is, how they managed to fit complexity into a similarly compact form.[52]

The felt responsibility among teachers of English to provide their students with the skills necessary for a critical evaluation of television programming prompted them to organize workshops and symposiums aimed at better understanding the new medium. From the mid-to-late 1950s the Committee on the Study of Television of the National Council of Teachers of English held several symposiums which brought together members of the television industry, high school English teachers and professors of literature. The symposiums centered around the nature of the television drama and the adaptation of literary materials to the new electronic medium. On the surface they presented the opportunity for scholars and teachers to ask specific questions of writers, editors, producers, managers and actors and actresses about the ins-and-outs of the industry and in general to solicit clarity on how dramas were produced. Louis Forsdale, Assistant Chairman of the Committee and associate professor of English at Teachers College,

[52] Steinberg, Erwin R. "Television and the Teaching of English," *The English Journal*, Vol. 49, No. 7 (Oct., 1960). Pg. 484.

Columbia University, opened one such symposium on the television drama by framing its purpose this way: "We are not sure that English teachers throughout the country are equipped at the moment to talk as sensibly as they might about television. If one assumes that television is a unique medium ... then it follows that in its uniqueness it has qualities about which we English teachers should know, with which we should attempt to acquaint our students."[53]

But just as with the teaching of television, ultimately these discussions functioned as a way for professors and teachers of English to work through the character of the new electronic medium by way of an analysis of its direct relationship to print culture. Underneath frequent questions posed by the moderator and numerous topics broached by the panel, for instance, was a constant concern over how well the literary canon would play on television. There was, for example, a detectable anxiety over whether all literary genres were transferable to the new medium. Satire, all agreed, was noticeably absent from literary television—both in original teleplays and in adaptations from the canon. Some chalked it up to the tenor of the time, specifically McCarthyism. Others attributed the lack of satire it to the larger problem which they themselves were committed to resolving—general intellectual passivity surrounding the new medium. "Satire requires active participation," offered Milton Kaplan, Chairman of the English department at George Washington High School in New York City," and I think most of the participation you get in television is passive on the part of the viewer."[54] Poetry was another genre of concern. Some thought poetry was ill suited for television because of its strict adherence to the word. Poetry was not based so much on plot, character development or other narrative elements which can be largely preserved while altering the original text. In television, especially,

[53] Kaplan, Milton. Ed. "Television Drama: A Discussion," *The English Journal*. Vol. 47, No. 9 (Dec., 1958). Pg. 550.

[54] Ibid. 553.

where the writer had no final rights, producers, editors and actors and actresses nearly always altered texts as they produced a program. Poetry suffered under such conditions, one writer offered, "because it is written in a form that is difficult to violate."[55] Others felt that poetry had a promising life beyond the page, or rather, on the screen. Robert Herridge, producer of "Camera Three," offered an example. He had produced a forty-five minute version of Carl Sandberg's *The People, Yes*, whereby the camera broke between five separate characters reading their respective parts. Sandberg later told Herridge that he had accomplished something Sandberg himself could not. On the page, Sandberg had "only one voice," he told the producer.[56] The televised version had effectively set apart sections differing in tone by focusing the camera on distinct readers.

Here, as elsewhere, the close-up of the camera was key to adapting literary materials to the television. The close-up was one of several features which contributed to the "intimacy" of the new medium when compared to print, theater or film. Others were the size of the television screen and its place in one's home. This "intimacy" affected all areas of production and, according to the participants of these symposiums, was the defining feature of the new medium when adapting literary works into the new format. "The television camera … is the most searching eye of all," one participant put it. On the one hand, the close-up could give clarity to obscure lines in Shakespeare and elsewhere, as one participant offered. On the other hand, all seemed to agree that the intimacy of the new medium meant that *character* and not *action* had to be the focus of quality drama on television, though participants disagreed on how best to meet these formal requirements of the new medium. Many thought that adapting literary materials to television required cutting subplots and extraneous characters, not just because of time

[55] Ibid. Pg. 558.

[56] Forsdale, Louis. Ed. "Adapting Literary Materials to Television: Part II," *The English Journal*, Vol. 45, No. 1 (Jan., 1956). Pg. 19.

constraints, but because the new medium was best geared towards a deep and meaningful analysis of key characters. Robert Herridge took another tack. Claiming to do what Henry James might do in the era of television, his show used a good amount of descriptive narration to set up key scenes and then he hit the actor or actress with the camera right on top of his or her scene. "The narrator builds the scene for the actor," Herridge explained, using his production of *Moby Dick* as an example, "As we dissolve into the scene itself, the actor can be turning toward the camera at the point, let's say, which is at the top of his rage, and the narrator has set the whole mood."[57] Tethering these two elements together, a purely verbal narration and the unique opportunities of the television camera allowed him to cover more ground and cut fewer sections from the original story.

Thus, the subject of adaptation allowed participants of the symposia to work through the formal connections between television and the printed page. But institutional differences were also a concern. Especially at the Committee's 1958 conference on "Television Drama" questions of sponsorship, censorship and unease about the future of quality television drama came to the fore. Producers spoke of sponsors pulling pieces without happy endings and of increased negative viewer feedback following complicated or dark works. They spoke of the recent deterioration of major programs and of the very real possibility that others would soon follow. One by one, members of the television industry sitting at the table appealed to those with classrooms. "I think the English teacher is in a perfect position to stress the classic dramatic values, most of which should be in good television," declared Ross Donaldson, manager of program submissions for NBC. He appealed to teachers to get their students and to themselves write in when they saw something of quality. A more vocal audience with developed taste, he

[57] Ibid. 519.

averred, was one way to counter the mass of negative feedback that was presently driving quality down. Herbert Brodkin, staff producer for Studio One at CBS and Peter Cott, press and public relations for the Academy of Television Arts and Sciences, both urged teachers to instill "selectivity" in their students. Teachers of English and literature stood as possible custodians of continued quality television, they both argued, in their power to "create an audience for the better things in drama."

## VI. "Television Education" and Instructional T.V.

Teachers of English had another way to influence the character of television in these years--instructional T.V. For those interested, instructional television, like "television education" in the classroom, offered them the opportunity--at least in theory--to affect the T.V. viewing habits of the coming generation and even, potentially, the overall landscape of television programming in America. It did so in a number of ways.

At the most basic level, instructional television put English scholars and teachers on T.V. at the exact moment that they were attempting--perhaps more earnestly than ever before or since--to shape the nature of television viewing and the quality of on-air programming. At the very moment, that is, when they believed, or at least hoped, that they could play a role in influencing the landscape of television, they were also asked to enter the studio themselves and produce engaging educational programming, to broadcast their guidance in literary and cultural matters to thousands of local residents, and at times to a national network.

Practitioners in the field of English were not the only educators who hoped that instructional television offered the means to overhaul the character of T.V. programming in America. By the late 1950s, 8.5 million people were "regular" viewers of educational television programming, with 2.5 million tuning in each week. What's more, in these early years of educational television, dominated as they were by professional educators, a full fifty-three percent of all programming was instructional in nature, or lecture-oriented, and forty-one percent consisted of for-credit telecourses.[58] Educational television, in the first decade of its existence, meant largely bringing the instructional content of the high school or college classroom into the home and thus to a broader public. The audiences for telecourses were often hundreds and sometimes thousands of times larger than those registered for credit--a fact ubiquitously celebrated by advocates for instructional television.

Figure 1.9. Baxter constructed his own miniature model of the Globe Theater for his *Shakespeare on TV* course. At nine pounds and 22 inches high, Baxter used the model to demonstrate key principles of stage arrangement.


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Figure 1.10. A model of the first printing press, also used on *Shakespeare on TV*. Baxter made both models in his garage in South Pasadena.
Image source: "TV Prof Makes His Own Props," *Popular Science*, March 1955. Pg. 133.

Alterative uses for the television in closed circuit campus systems also played a role here. As mentioned above, practitioners in many fields found the television exceptionally

[58] Schramm, Wilbur. *The Impact of Educational Television: Selected Studies from the Research Sponsored by the National Educational Television and Radio Center*. (Chicago: University of Illinois Press, 1960); 8.

useful in, among other matters, behavioral experiments, biological research and in-class scientific demonstrations. By the mid-1950s, there was wide-ranging speculation about a variety of other uses for on-campus closed circuit systems--for example, arrangements between laboratories and classrooms (so that one experiment could be broadcast to several classrooms) and between libraries and research facilities (so that researchers could consult texts by having a librarian point a camera towards a book situated on a stand). In short, on-campus televisions were being increasingly used--and increasingly imagined--more as communications systems for the real-time remoting of visual information. The widespread existence of televisions in spaces of instruction and research led some educationists to hope that the meaning and import of the T.V. screen could be re-oriented for the coming generation of viewers. If students encountered televisions in auditoriums, lecture halls, classrooms and study carrels, and if they encountered their use in psychology experiments, biology demonstrations and anthropological research as much, or even more, than they did in the home, then they might be convinced that television's function was, in part, to transmit the world's knowledge. Thus, by the mid-to-late 1950s, when the instructional television movement was in full swing and when closed circuit systems were being used for a myriad of purposes on campus, many educators imagined that the meaning of television was, in some sense, up for grabs.

Ultimately, it was within this overall atmosphere of optimism among educators that the function of the television could be recast that professors and teachers of English hoped to foster more literary experiences of the new medium. English professors and teachers hoped that English instructional television programs would become part of the overall higher quality of T.V programming in America, and in particular, part of the more literary-oriented landscape of such programming. Audiences, they hoped, would start to watch English lessons just as they were

already watching quality TV dramas and literary adaptations and in this way, the two would reinforce each other. An increase in quality television drama--literary television--in these years, would take place, they imagined, alongside and in conjunction with the increased viewing of educational literature lessons.

The most famous television teacher in the field of English, by far, was Frank C. Baxter, professor of literature at the University of Southern California. In 1953, KNXT, the CBS affiliate in Los Angeles offered USC an hour of "public service" each Saturday at 11 A.M. USC filled that hour with a series developed and taught by Baxter, *Shakespeare on TV*. The series was an instant success and the next year CBS picked it up for national broadcast. The following year, *Shakespeare on TV,* or English 356a, was taken for credit by 332 USC students. Nine-hundred people audited the course and a full 400,000 watched it.[59]

*Shakespeare on TV* ran for three semesters by which time Baxter had moved onto other ventures. In 1954 he developed and produced a series, *Now and Then*, which ran on ninety-five CBS stations nationwide. The show covered a range of literature from Egyptian myths to contemporary drama. The following year he designed his final series for CBS, *Renaissance on TV*. In addition to his standard lectures and demonstrations on Renaissance art, music, architecture, scholarship, politics and astronomy, Baxter interviewed renown scholars specializing in the period. CBS advertised the series, "dedicated to your cultural heritage," as a televisual bridge between the centuries: "The world's outstanding scholars on the Renaissance recreate on television the Age of Enlightenment."[60] In 1957, Baxter moved to two new networks.

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[59] "TV Students of Shakespeare Quit Screens to Take Final Examination." *Los Angeles Times*, Jan 24, 1954. Pg. B1.

[60] Misc print advertisement for Renaissance on TV. Box 1. Folder 3. Frank C. Baxter Papers, Collection no. 0263, Special Collections, USC Libraries, University of Southern California.

For NBC, he produced *Harvest,* a course in "man's achievements in art, literature, public affairs and science." For the Educational Television and Radio Center, he produced *The Written Word*, a telecourse based largely on a class he had taught for years in the Library School at USC, *The History of Books and Printing*.[61]

Baxter had high hopes for television. He, perhaps more than anyone, had reason for optimism. By the late 1950s, he had spent more than half a decade bringing the great cultural achievements of western civilization to hundreds of thousands every week. The potential for educational television, his own edifying programs included, seemed vast. "What a wondrous thing to awaken the curiosity, to stimulate the mind, to roll back the horizons of our world in both space and time, the sweeping panorama of all mankind," Baxter declared in an interview for *TV-Radio Life*, "Considering that evolutionary process, television is a limitless realm for developing the most widely learned and intelligent public in the history of man."[62] Baxter recognized his own shows as part of a new and promising landscape of television programming in America. He even, at times, imagined his own shows as vehicles for affecting the national mood. "This is a time of ferment, of complexity and conformity," Baxter declared, in talking about his 1959 series, *Harvest of American Literature*, "I think it is a good time for a close look at our historic American institutions. There were certain values by which our democracy lived in those days. They are worthy of more familiarity today."[63]

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[61] Memo from the Educational Television and Radio Center announcing the new series. Box 1. Folder 5. Frank C. Baxter Papers, Collection no. 0263.

[62] "Give your IQ a lift with Television," *TV-Radio Life*, November 18, 1955. Box 1. Folder 5. Frank C. Baxter Papers, Collection no. 0263.

[63] MacCann, Richard. "TV-Teacher Explores Literary Past," *Christian Science Monitor*. December 22, 1959. Pg. 5.

But Baxter wasn't just encouraged by the rise of instructional television. He was equally optimistic about the parallel ascent of literary television in the mid-to-late 1950s. Again and again, in interviews, Baxter talked about the conspicuous improvement of television drama in the mid-1950s and linked it to his overall optimism regarding the potential of the new medium for the dissemination of knowledge and culture.

> Think of the youngsters today who have the great heritage of our western world brought into their homes… Through the intimacy of the television the play is brought to him for his inspection at close range, and though he may not realize the full import of the language, the concomitment gestures and facial expressions of the actor carry the meaning, he is learning, enjoying, tasting, savoring one of the great geniuses of all time. Shakespeare of course is but an example, an example that can be multiplied on all fronts of the horizons of knowledge … it is an indication of the tremendous impact television is having daily on millions of viewers.[64]

In fact, Baxter didn't just promote quality television drama, he was for a time, intimately involved in its production. "In the last two years there has been an obvious rise in the quality of program offering, the mere novelty of television has worn off," he claimed in an interview with the *Oregonian* in 1957, "There are things now to be seen on

[64] Ibid.

scheduled television at which the civilized man can look with delight."[65] He then provided examples: *G.E. Theater*, *Studio One* and his own show, *Telephone Time*. In 1957 and 1958 Baxter hosted the second and third seasons of *Telephone Time*, a drama series which featured the plays of John Nesbitt. Like his educational series on American literature, Baxter characterized the import of the show's dramas as a possible cultural antidote to conformity and complexity in the post-war era: "The stories on this show are a delight because they are stories about people who dare to be themselves, dare to do something. In a world paralyzed by the desire for security it is difficult to be an individual. It is heartening to see these strong people. It reassures you about the human race."[66]

Like others in his field, Baxter was won over by the potential cultural, and in particular, literary, benefits of the twin endeavors of *instructional* and *literary* television. Literary adaptations of Shakespeare, like those he celebrated, quality original teleplays, like those on his own *Telephone Time* and literary instructional programming, like that for which he was famous, were all part of a possible shift towards a more literary conception of television viewing. Each was an attempt to raise the cultural quality of television programming in America, to be sure. But each also endeavored to transplant the "literary experience" of the theater and the page to the home screen at a time when the meaning of television viewing was still up for grabs. Like others in his field, Baxter found himself in a unique position. As an English teacher at a time of quality literary television, he seized the opportunity to guide his students and others towards a more

[65] "Behind the Mike," *The Oregonian*. November 25, 1957. Box 1. Folder 6. Frank C. Baxter Papers, Collection no. 0263.

[66] *TV-Radio Life*, November 16, 1957. Box 1. Folder 5. Frank C. Baxter Papers, Collection no. 0263.

critical, reflective and discriminating set of viewing habits for the new medium. As an English teacher in the era of instructional television, he entered the studio himself and produced quality literary educational broadcasting that he hoped would act in cooperation with literary television.

But instructional television offered English educators more than just an opportunity to broadcast authoritative literary instruction which they hoped would work in tandem with literary adaptations and quality teleplays to help shift the nature of television and its viewers. It also offered them the opportunity to link the study of literature, traditionally done on the printed page, with the experience of television by bringing the former into the narrative and visual conventions of television programming. Again, the turn to T.V. was more than just serendipity. At the exact moment when professors and teachers of English were trying to use literary adaptations in the classroom to bridge the divide between the customary experience of T.V. and the "literary experience" of texts, they were offered the opportunity, via telecourses, to enhance their lessons of literature and to do so by constructing their own rich multimedia T.V. learning experiences centered around works of literature. In other words, at just the moment when English educators hoped to bridge the divide between the literary experience of the page and the routine experience of the television by way of quality drama programs and literary adaptations, they were also given the opportunity—an opportunity they never would have had without the instructional television movement of the 1950s--to translate the study of literature into a multimedia, televisual aesthetic akin to standard television programming.

Like those in other subjects, English television teachers learned early on that broadcasting a bare-bones classroom lecture would not sustain students' interests. Almost immediately English professors and teachers began to adapt the lecture method to the new

medium, working to make the presentation of literature something more akin to what students generally experienced when sitting down to watch television. English telecourses often made use of filmclips, pictures of literary figures and fictional characters, interviews, question and answer sessions and recordings of music and literature. They took special advantage of dramatic readings from books as well as dramatic re-enactments from literature, sometimes on film, but often live. "In the humanities, visuals enable us to bring to classes everywhere direct experience with works of art which are otherwise completely unavailable" wrote Professors Maynard Mack and Bernard Know of Yale University who combined their efforts with the Stratford Shakespeare Company in 1957-59 to produce a twelve-part television series on the classics, "In this respect there is an important difference between the use of educational visuals in the humanities and in the sciences… [the humanities teacher's] objects of study are too real -they are pictures to be looked at, plays to be watched, music to be heard."

But the creators of English telecourses also took advantage of filmic conventions. English 313: Values in Literature, taught by associate professor Martin S. Day and broadcast over KUHT at the University of Houston, supplies a ready example. Each telecast opened with this stylish sequence.

> The screen is filled with a host of books, suspended by invisible strings and slowly moving like mobiles. Lively music is sounding meanwhile. The camera pushes through the moving volumes towards a stationary book that bears on its front, "Values in Literature." In the close-up a hand opens the book, disclosing an end paper of Literary England, then a page "English 313," and next a page reading

> "With Dr. Martin S. Day." The music has dropped down and an announcer introduces English 313 and the lecturer.[67]

The content of the "lecture," as here in the fifth episode on the nature of fiction, also took advantage of a more established and compelling television aesthetic: the breaking up--and in particular, juxtaposition--of scenes; the use of a variety of camera angles, especially the close-up, to punctuate narration:

> After opening remarks to explain why fiction is the first specific type of literature to be examined, the instructor steps to the pad and writes upon it the first topic of the lecture, thereafter adding key words, such as "Aristotle," as needed. Discussing conflict or struggle as the essence of plot, he introduces a film clip of Pride and Prejudice by Jane Austin. The clip indicates the arrogant distaste of young Darcy for provincial girls and the bristling reaction by Elizabeth Bennett. In explaining the plot conflicts of man against nature, man, society and self, the lecturer places upon the easel copies of Conrad's Typhoon, Stevenson's Kidnapped, De foe's Moll Flanders, and Dostoevsky's Crime and Punishment. Camera close-ups of each book accompany the discussion of the volume.[68]

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[67] Day, Martin. S. "Teaching Literature by Television," *The Reading Teacher*, Vol. 11, No. 1, (Oct., 1957); 29.

[68] Ibid.

Telecourses like English 313 gave English professors and teachers the power to, themselves, design and help construct programming which suggested to those watching--their students and others--that the study of literature could look like "television" and not just like a classroom. Granted, any field employing dramatic reenactments (psychology courses, in particular used reenactments) and/or utilizing the filmic conventions of shot duration and camera angle and movement to better present the subject matter of their discipline were ultimately linking the study of that subject matter to the narrative and aesthetic conventions of television. But for English educators who were interested in establishing a kind of cross fertilization between the traditionally critical engagement of the printed page and the developing habits of television viewing, this opportunity had special import.

Both by broadcasting expert televisual literary instruction which English educators imagined would take its place alongside quality literary television and by making that televisual instruction look and feel more like conventional television programming, English teachers and professors hoped to bridge the gap between the experience of literature and television in the mid-to-late 1950s. Doing so, they hoped, would encourage students and others to approach television as a kind of literature and in turn to grow up demanding superior programming from television producers and executives. Thus, what we see in these years is an attempt by English professors and teachers to couple the television program, in the minds of their students, with superior, literary storytelling and in doing so endeavor to shape the student's habits and expectations surrounding the new medium. In the end, it was an effort by humanists to shape the very nature of the technology itself at a time when its very character--its software, its associated customs, habits and expectations, its publically agreed upon purpose--was still up for grabs.

Still, regardless of how optimistic scholars and teachers of literature were about the potential cultural value of television in these years, no matter how open or seemingly radical they were in considering forms of popular media to be genuine culture, their aim in the mid-to-late-1950s was still nearly always to bring television as a medium up to the quality of print culture. Even those who celebrated the innovative literary nature of the new medium shared with the most determined of mass culture critics the notion that print culture was the standard by which any true cultural medium would have to be measured. This was a position that would significantly soften in the 1960s.

**VII. The Limits of Educational Television: Towards the 1960s**

A confluence of developments in the late 1950s and early 1960 led to a major shift in the character of educational television away from the lecture-oriented, educator-dominated, instructional television of the 1950s and towards the public-television style cultural programming of today. Mounting disillusionment over the development of commercial television programming throughout the late 1950s and early 1960s, led a coalition of reformers at key funding agencies, educational television institutions, the FCC and congress to re-orient the purpose of educational television away from formal instruction and towards broader cultural uplift—to use educational television's infrastructure to offer superior cultural programming as an alternative to commercial television emerged elsewhere.

The trouble began with the shifting nature of commercial television programming in the late 1950s and early 1960s. It was in these years that the center of television production moved from New York City to Hollywood. At the same time, the focus of prime-time programming

shifted from anthology series utilizing new sets of actors and actresses each week to character-based series like "I Love Lucy;" while dominant genre in general switched from drama to action adventure. In 1956 NBC aired five and half prime-time hours of live drama a week. In 1959, that number was down to two hours. Within the same time-span, the number of hours devoted to telefilmed westerns rose from three and a half to fifteen. "How different this is from the situation of a few years ago," Erik Barnouw, a broadcast historian at Columbia University and chairman of the Writers Guild of America, told the FCC's Office of Network Study in 1960, "Already that period, in retrospect, looks like a golden age."[69] By the 1957-58 season, many television critics who were allies of the industry a few years prior, were decrying the apparent shift. Many hoped that a united front of critical voices could turn things back. "I have never been a critic lover," producer David Susskind told TV Guide in 1959," But the low condition television has been in the past year, the most potent voice has been the critic... Without the critic, I believe we would have more mediocrity than we have now."[70] A number of critics, Jack Gould, John Crosby and Gilbert Seldes, foremost among them, had similar hopes. In their castigations, they aimed to council industry on what would be lost by moving forward. "The economies of the situation are favorable to the spread of the filmed [Hollywood] play," Seldes warned in 1956, "The only hope for a reasonably intelligent TV drama lies in the hour-long play done live—and (so far) chiefly in New York."[71]

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[69] U.S. Federal Communications Commission, Office of Network Study. *Second Interim Report: Television Network Program Procurement*. Washington D.C.: U.S. Government Printing Office, 1965. Pp. 542.

[70] Qtd in Stahl, Bob. "What Good are Television Critics?" *TV Guide*, January 1959, Pp. 8.

[71] Seldes, Gilbert. *The Public Arts*. New York: Simon and Schuster, 1956. Pp. 183-84.

The guidance on offer from Seldes and other critics was ignored. From 1958 through the early 1960s, things only got worse for television, as the industry underwent a series of public relations setbacks. The quiz show scandals of 1958-59, several FCC bribery scandals of 1959 and Senate investigations into television violence in 1961 all led to widespread concern that television was becoming a medium of sordid subject matter, mindless escapism and engineered sensationalism. The quiz show scandals, in which contestants participated in rigged trivia contests, were particularly shocking both to cultural commentators and the public in general. From 1958 to 1959, several quiz shows, *Dotto*, *Twenty-One*, *The Challenge* and the *$64,000 Question* were all found to have scripted their competitions by feeding answers to contestants they thought were charming and telegenic. Charles Van Doren, a contestant on the show *Twenty-One*, was one such personality. Van Doren's fated winning streak on *Twenty-One* propelled him to national fame, appearing on the cover of *Time* magazine in February of 1957. Van Doren was a professor of English at Columbia University, son of poet and literary critic Mark van Doren and nephew of the Pulitzer Prize-winning biographer Carl Van Doren. The idea that television's production practices could corrupt a member of one of the most distinguished families in American letters, seemed literally, to demonstrate the effects of the new medium on established American culture. "The one thing that can be salvaged from this sorry situation is an awakened sense of public outrage that may yet force reforms in the industry that made it possible," declared the *New York Times*, "Whether through governmental regulation, nonprofit competition, internal reorganization - or perhaps all three, the radio-television industry will have to undergo a dramatic reform if it is to regain the confidence of the American public."[72] A year later, FCC Chairman John C. Doefer and Commissioner Richard Mack were forced to resign for accepting

[72] "Symptom of a Sickness." *New York Times*. Nov 3, 1959. Pp. 30.

gifts from industry groups in return for granting broadcasting licenses. Finally, in 1961, the Senate Committee on the Judiciary's investigation on the "Effects on Young People of Violence and Crime Portrayed on Television" revealed, among other things, that writers were regularly asked to increase the amount of violence in their scripts.

All of this led FCC Chairman Newton Minow to famously declare television a "vast wasteland" in 1961. Minow was among a newly influential cadre of liberal reformers who felt strongly that the federal government had a responsibility, in the age of television, to regulate the use of broadcast technology for the cultural good of the public. "Why should the national government stand helplessly by," Arthur Schlesinger Jr. asked in 1960, "while private individuals, making vast sums of money out of public licenses, employ public facilities to debase the public taste? Government has not only the power but the obligation to help establish standards in media, like television and radio, which exist by public sufferance."[73]

By the early 1960s, liberal elites in the Kennedy administration and key members of congress began imagining a new role for educational television, one which served the public's interests more broadly. The White House and Congress were joined by two other key players. In 1959, Jack White, a protégé of Robert Hutchins, became the president of the National Educational Television and Radio Center (NETRC), which by the late 1950s was becoming the central organizing institution for educational television. In 1963, the NETCR would become the National Educational Television Network (NET) and in 1967 all NET stations would become absorbed into the Corporation for Public Broadcasting. In the early 1960s, Jack White became dedicated to making the NETCR the "fourth network," or more to the point, the "Harper's

[73] Arthur Schlesinger Jr. "Notes on a National Cultural Policy," *Daedalus*, Vol. 89, No. 2. Spring, 1960. Pp. 394.

Magazine" of television. Instructional television appealed to students and highbrows, White wanted educational television stations to produce programming that reached "middlebrows." In 1963, the Ford Foundation, the premier funder of educational television stations and programming, changed its tack as well. In that year, it granted NET a $6 million grant on the condition that "All the Center's resources would be directed at supplying high-quality informational and cultural program service for noncommercial television." Jack White immediately began recruiting producers from commercial television. From 1963-66, lecture oriented programming and for-credit courses, already waning, began to disappear altogether. In their place, nearly all educational television stations began broadcasting middlebrow programming provided by NET: documentaries, public affairs shows, children's programs, NET Playhouse. In 1967, the Corporation for Public Broadcasting (CPB) was established to fund NET and in 1970, its production and distribution infrastructure was incorporated directly into the Public Broadcasting Service (PBS) as it began operations.

These developments found those humanists interested in using instructional television to help improve the overall landscape of T.V programming doubly disadvantaged. On the one hand, like Minow and others, they too felt the opportunity for quality cultural programming rapidly slipping away. As literary adaptations and live anthology programs were replaced again and again with action adventure, hopes for an era of literary television became nearly unsustainable. On the other hand, the conditions for their disillusionment were also the factors pushing Minow and others to reorient educational television away from their uses. By the early 1960s, humanists' capacity to use instructional television to intervene in the meaning and purpose of television waned at the same time that such an intervention seemed beyond hope.

As we'll see in the next chapter, humanists remained fundamentally interested in television, but of course the meaning of the device would change. The expanded electrnic environment of the 1960s shifted the meaning of all media—film, television, radio, even magazines. All media became seen, more and more, as part of an instantaneous, potentially global, nearly-cybernetic information network in which ideas and experiences circulated faster and faster. In the 1960s, humanists pedagogical interest in television would shift as well. No longer about getting students to watch good TV, or even to think of television as akin to the printed page, they instead focused on the role of television in an overall instantaneous electronic communications environment. Thus, the impulse among humanists to help their students develop levels of taste and discrimination in their engagement with television in the mid-to-late 1950s, became, in the 1960s, part of a larger effort to prepare students to critically engage their novel world of newer media in general. In short: humanists' theoretical and hands-on engagement with television in the 1950s was their first significant foray into electronic culture and it set the stage for their wider efforts to shape the meaning and purpose of electronic media—in the classroom and elsewhere--in the 1960s. It is here that we will take up the growing efforts of the socio-technical humanities in chapter 3.

## Chapter 2 || Instructional Media, the Information Explosion and the Challenge of Electronic Culture in the 1960s

The computer was not the only networked, electronic device thought to be capable of the type of instantaneous information transmission necessary to combat the social ills of the post-WWII knowledge explosion. In the 1960s, the computer competed for that honor with a host of other audio-visual electronic media. Throughout the decade, educational researchers, audio-visual specialists, librarians, and members of the electronics industry, to name just a few, proffered a vision of the near-future when students would learn both at home and in the classroom via a multi-sensory arrangement of media.

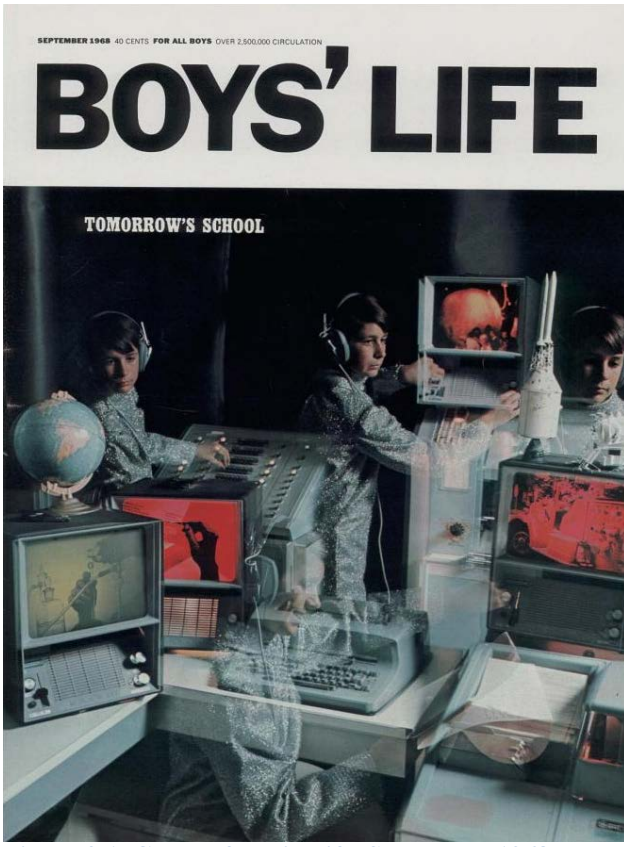

Figure 2.1. Cover of Boy's Life. September 1968

"Picture yourself in front of a television screen that has an electronic typewriter built in below it," *Boy's Life* envisioned education a generation from 1967, "You put on a set of headphones, and school begins."[74] Typical of these mid-1960s futuristic visions of education, electronic learning was cast as fundamentally interactive, even immersive (Figure 1).

[74] Moffet, Samuel. "Computerized School House," Boys life. September 1968. Boy Scouts of America, New York. Pp. 24.

Thanks to recent advances in communications technology, the student's engagement with knowledge and information now traveled along multiple sensory registers and required their individual cooperation. Such methods accelerated the rate of learning at a time when the production of knowledge itself was quickening beyond measure. "Throughout these lessons you never would have to see a teacher," the article enticed its readers, "And yet you could be learning faster than you might in a regular classroom."[75] Also typical, the author described a world where children didn't learn in school so much as they learned how to learn—how to manage information amongst multiple media-devices. They learned how to deploy media to their advantage, how to teach themselves in a world transformed by rapidly increasing knowledge and by a myriad of new information technologies. After all, commentators both inside and outside education warned, as the production of knowledge continued to accelerate, students would have to become lifelong information managers.

For just this reason, the home of the future was often envisioned as a necessary educational counterpart to the classroom. Here, a parallel set of educational equipment, this time centered on the television, could be set up. In the same year as our *Boy's Life* article, the educational journal *Phi Delta Kappan* invited several authors to forecast the future of learning. In "Education in the Cybernetic Age," S. L. Kong, professor of psychology at University of Toronto, opened his article with an imaginary anecdote. A girl wakes up one morning curious: how do birds fly? She goes to a room in her home with a large television built into the wall. Not the living room where the television is still used for entertainment, but the other room with a

[75] Ibid.

television—the "education room," standard in every home in the "cybernetic age of education."[76] She pushes a button and asks how birds fly. In Long's vision, teachers do exist, but they have become information resource managers; they respond to children's homegrown curiosities with appropriate information and directions. They "mediate," as Long put it, between children and available information. "The large screen on the wall brightens up and there she sees the familiar face of Mrs. Brown. 'Good morning, Lana, did you see some birds recently?'" Ms. Brown faces Lana on a screen. Next to Lana's image is a comprehensive record of her past inquiries and experiences relevant to the topic at hand. Lana answers affirmatively and the lesson continues. "With Mrs. Brown's picture automatically moved to one corner of the screen, there appears on the rest of it pictures of birds in motion," Long explained, "With the aid of a few sets of pictures selected and transmitted from the Education Center, Mrs. Brown demonstrates effectively some relevant facts about the flying process."[77] Finally, Ms. Brown suggests to Lana that she go to Station 26 at the Community Center to get a real look at live birds.

So where did this vision come from? What developments in the first years of the 1960s made it seem possible, even necessary? This chapter is devoted to answering these questions. The next chapter describes how humanists responded to the possibility that, given these developments, information, knowledge and culture might be making a sizable migration to the multisensory realm of electronics.

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[76] Kong, S. L. "Education in the Cybernetic Age: A Model," The Phi Delta Kappan, Vol. 49, No. 2 (Oct., 1967). Pp. 71.

[77] Ibid.

## I. The Meaning(s) of Educational Technology

New technologies have the potential to alter established systems of human conduct—modes of production, work and other practical affairs, but also modes more fundamental to the human experience, for instance, modes of thought and perception. When a new motive power is introduced, it alters the economies of scale in relevant production areas and which sources of energy are sought after. When a new transportation technology is introduced it has the potential to alter one's relationship with friends, family and nation and in general with one's geography; that is, it has the potential to alter the meaning of one's place within a city, state or country as well as one's perceptions of space, distance and even time. Media in particular, as the conveyors of information, knowledge and culture—as the conveyors of representations of reality—have the potential to alter the human experience in fundamental ways.

The ways in which new technologies alter the human experience are ultimately the product of the agreed upon functions, purposes and associated customs and habits of that new technology. What's more, those functions and habits are largely unsettled and undefined in the first years after a new technology appears on the scene. Thus, when groups battle over the ultimate functions and purposes of a new technology, they are ultimately, consciously or not, battling over how that technology will potentially restructure the human experience. In particular, when groups battle over competing visions for future media landscapes, they are always, implicitly or explicitly, battling over what kind of relationship humans will have with information, knowledge and representations and thus over what kind of relationship they will have with the reality of their world. The portent, therefore, is great, when a new media or set of media is introduced. A contest emerges not just over who will own it or produce it or sell it or

use it, but by proxy, over how it will affect or influence the public's engagement with information, culture and with the rest of the world and how it will affect or influence their sense of what can and should be done with the record of human thought, how new knowledge is to be produced and disseminated, and even, what constitutes knowledge.

In some ways, educational media are a special case here. They are the method by which individuals and societies do more than just take in information. All media do this. Educational media are also the technological means by which individuals are explicitly instructed on how to divide, synthesize, systematize and critique information. Educational media—and their engineers and advocates—have deep designs on how individuals learn and how they think. For this reason, educational media have a particularly portentous moment when they are new—when their functions, uses and meanings are initially ill-defined. The "electronic revolution in education," in the early-to-mid-1960s, was, for instance, a heady moment in the history of technology. In these years, numerous groups vied to assign particular purposes, meanings, theoretical implications, and in general, technological forecasts of grand social and cultural import to the myriad of new instructional technologies rapidly emerging. Technologies, I'm arguing, when new, are like ciphers into which invested groups pour their distinctive needs, desires and expectations. In the 1960s, educational media became such a cipher.

After the mid-1970s, educational or audiovisual technology came to mean largely, supplemental instructional aids—video, overhead transparencies or PowerPoint presentations used to augment or enliven lecture material. In the 1960s, I'll show, "educational technology" or "audiovisual equipment" meant something potentially closer to advanced man-machine information systems. No one today would talk of lasers or global satellite communication in the same breath as "audiovisual technology;" in the 1960s they regularly did. In these years, all three

were thought to be a part of a new advanced, electronic communications environment in which ideas and information moved faster and faster.

To educational technologists, educational media became, on the one hand, a way to professionalize their field by linking it to the robust theoretical apparatus of cybernetics and information theory. On the other hand, it became a way to promote a cybernetic vision of human-machine information exchange, a vision which, despite the ultimate failure of educational technology in the 1960s, helped popularize a set of critical ideas about the nature of information, technology and humankind in these years—namely, that information technologies were fundamentally similar to human nature. To the electronics industry, educational media became a way to announce, promote and initially market the total supersession of print media—a way to signal the eminent coming of a world where push-button, screen-based, communications and culture brought people and information closer together than ever before. It was a world, as the electronics industry promoted it, where the eclipse of print and audio-only communication brought with it a near *unmediated interconnectedness* between people, on the one hand, and events, ideas and information, on the other. There are places where these two visions were complementary, even mutually reinforcing. But together they show the degree to which the portent of educational technology was up for grabs in these years; that is, the degree to which, as an emergent set of technologies, they were conceptually un-fixed, and could thus theoretically be invested with particular values, uses and meanings by these groups. As we'll see in the next chapter, it was within this heady, but still open-ended, mix of theoretical and futuristic visions for educational technology that humanists attempted to insert themselves and their own designs for its uses and meaning.

## II. The Information Explosion

In some sense the term "information explosion" denoted two separate but related quandaries. For some, the term applied, at least most relevantly, to the sudden accumulation of data, knowledge and recorded thought generated by the postwar boom in scientific, medical and technical research. "About 90% of all scientists who ever lived are now at work—and, it seems, most are publishing their findings," *Time Magazine* summed up the dilemma in 1965:

> In 1750, there were about ten scientific journals in the world; today there are about 7,000 related to the biomedical sciences alone. Once scientists wrote about physics, chemistry and biology; today they deal with the likes of biochemistry, bioengineering, exobiology and biophysics. In 1950, chemists produced 558 articles every two weeks for their publications; in 1965, in the field of chemistry alone, those learned explorers are turning out—and publishing —6,700 articles every fortnight.[78]

[78]"Libraries: How Not to Waste Knowledge," *Time*. September 3, 1965.

The "information explosion" joined a number of other critical social phenomenon in the nineteen-sixties commonly referred to by alluding to atomic detonation; others included the "population explosion" and "technological explosion." Indeed, more than a handful of commentators compared the unanticipated and potentially catastrophic nature of the information crisis to atomic or hydrogen blasts, a "mushroom cloud of knowledge which has obliterated all familiar landmarks," as one author put it.[79] Even IBM's 1962 advertisement linking the firm's research to solutions for the information crisis included a sculpture by Harry Bertoia, "The Information Explosion" made of circuitry wire shooting up and out like a mushroom cloud (Figure 2). For some, the nature of the crisis was catastrophic. The new avalanche of published material in scientific and technical fields, some argued, threatened to confound innovation and scientific advancement by producing both ignorance and informational gridlock. Increased specialization threatened to fragment science into innumerable isolated fields with little to no communication between them. Additionally, individual scientist now ran the risk of becoming dangerously ignorant of all available research in their own area of specialization.

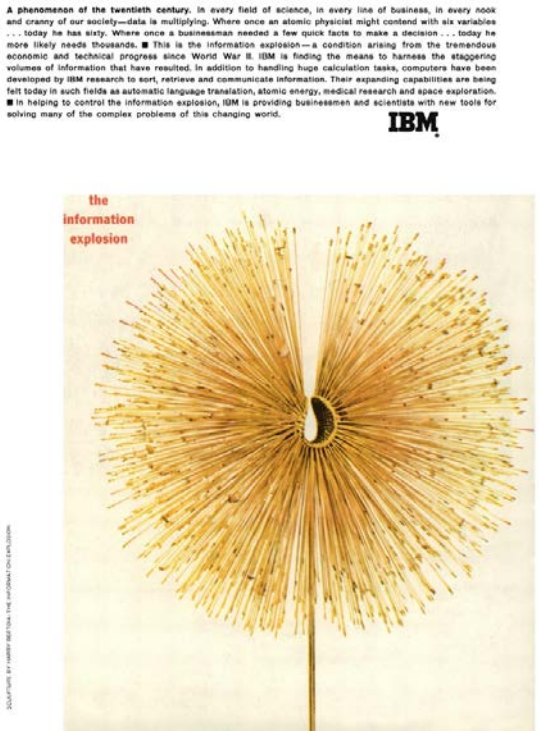

**Figure 2.2.** ***Science*****, New Series, Vol. 136, No. 3515 (May 11, 1962), Pp. 400.**

[79] Reiten, E. A. "The 'Knowledge Explosion' and the Academic Man," The Journal of General Education, Vol. 18, No. 2 (July 1966). Pp. 73.

No one who spoke of the information explosion did so without reflecting on the central role scientific and technical research played in it. But to many, the term denoted something more widespread, affecting all areas of knowledge. Indeed, the phrase came into wider usage around mid-decade (Figure 3), and was employed to refer to the overproduction of knowledge,

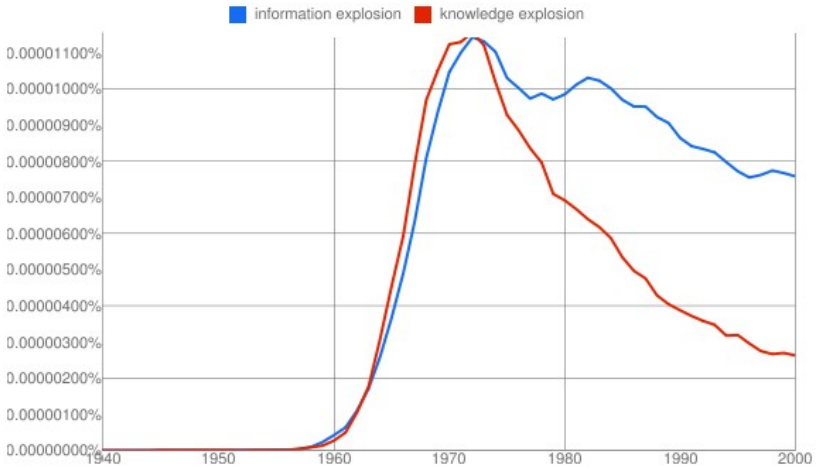


**Figure 2.3. Google Ngram Viewer for "information explosion" and "knowledge explosion" between 1940 and2000, English Corpus (1.5 million books), smoothing = 3.**

generally, and to published material, in particular. Often authors characterized the situation by pointing to the accelerated expansion of the written record in the modern world, specifically the quickening pace at which knowledge doubled. "There was a time toward the beginning of man's history when knowledge took 10,0000 years—perhaps even 100,000 years—to double, and that at a later period it doubled in 1000 years, and still later in 500 years," wrote Walter Ong in 1968, "It has been estimated that today man's knowledge doubles every 15 years."[80] Even within the decade, the growth of published material was dizzying, pundits frequently pointed out. In 1966, 20,542 new books and 7,909 new editions of older books were published in the U.S., almost twice the number that had come out in 1960. By 1963, the federal government alone was

[80] Ong, Walter. "Knowledge in Time," in Walter Ong, ed., *Knowledge and the Future of Man: An International Symposium*. New York: Holt, Rinehart and Winston, 1968. Pg. 3.

producing an estimated 25 billion pages of documents a year and had accumulated enough paperwork to fill 7.5 Pentagons.[81] The increased production of knowledge, data and recorded thought was tied to a host of social forces, over-specialization and the ascendancy of the research university among them. But it was also tied to technological forces, in particular, the onslaught of new communications technologies from the late 19th to the mid-20th century. Indeed, the phenomenon was often accounted for by pointing to the fact that the exponential growth in such technologies paralleled the accelerated accumulation of "man's record."

### III. Educational Technology in the 1960s

> Above all, higher education is going through its first great technological change in five centuries--the electronic revolution ... Agriculture, transportation, industry, and the military have been impelled forward by new technology. Now it is higher education's turn. (Clark Kerr. *The Uses of the University*, 1963)[82]

For many, the revolution in information technology could not have come any sooner to the realm of higher education, nor could it have been better suited. As colleges and universities in Post-WWII America became increasingly viewed as the seat of modern knowledge production, cutting-edge communication technologies seemed only a natural fit for campuses. "Today and tomorrow's universities are at the vortex of the technological society," argued Robert D. Tschirgi, Dean of Planning for the University of California system, "Into them are poured the

[81] Bourne, Charles P. Methods of Information Handling. John Wiley & Sons, Inc., New York: 1963. Pp. 1.

[82] Kerr, Clark. *The Uses of the University*. Cambridge: Harvard University Press, 1963. Pp. 209.

unanswered questions, the untutored populace, the needs, hopes, and aspirations of mankind. Through the alchemy of education and research, society has come to expect that from the cornucopia of the universities will pour forth all the good things for a better life. If they are to achieve any fraction of this grand design, the universities must seek to maximize communication within themselves [and] among themselves."[83] In some quarters, communication and information processing became seen as so central to the role universities played in society, that many began to compare the institutions with computers themselves. Tschirgi was in fact speaking at a two day symposium, "Computers and Universities," held in 1965 at the University of California, Irvine, where discussion revolved not just around the role of computers *at* universities, but often functioned as a way to think about the ways in which universities were themselves data processing systems. "Since universities are systems that are intimately concerned with handling information, and computers are the same, it seems inevitable that there should be some kind of explosive interaction between them," asserted Ralph Gerald, the Dean of the Graduate Division at the University of California, Irvine.[84]

As the transmission of information and knowledge within and between colleges and universities became seen as more and more critical, a movement emerged in higher education to construct inner- and inter-campus information networks. At the center of such efforts was an organization new to the educational scene, the Interuniversity Communications Council or EDUCOM whose mission statement opened with the following assertion: "Broadly conceived,

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[83] U. S. Department of Health, Education and Welfare, Office of Education. *Computers and the University: A Workshop Conference Presented by the University of California, Irvine with Cooperation of the University of Michigan, Newport Beach, November 8-12, 1965.* Contract No. OE-5-16-022. See also: "Computers on Campus," *Bulletin of the Interuniversity Communications Council (EDUCOM).* January, 1966. Vol. 1. Number 1. Ann Arbor, Michigan: EDUCOM. Pp. 9.

[84] Ibid.

the essential role of the university may be viewed as information processing: research, teaching, learning and in libraries, the storage and retrieval of knowledge." Founded in 1965 with a $750,000 grant from the Kellogg Foundation, EDUCOM began as an association between eight private and public universities in the United States. By early 1966, their membership had exploded to include 100 campuses from 25 universities in 17 states. EDUCOM took as their purview all educational communications, that is, all on-campus information processing activities--"computerized programmed instruction, library automation, educational television and radio, and the use of computers in university administration and in clinical practice."[85] Their purpose was to report on the status of such technologies and to promote their expansion by way of task forces set up to investigate critical developmental issues. Under their self-imposed charge were the tasks of investigating the feasibility of national computerized or microwave networks for the transmission of educational data and programmed instruction, the formulation of consistent teaching methods for the broad range of existing electronic teaching and learning systems and copyright laws as they affected modern practices of storing, retrieving, duplicating and disseminating information, records and documentation. In the end, the aim of EDUCOM was to create a coherent structure for the national inter-university networking of electronic resources, educational practices and information. "In the communication age, the University is ... an ideal user of advanced technology," Vice President, Hubert Humphrey wrote to EDUCOM in 1966, "what you can achieve in 'togetherness' --in interuniversity information networks, in programmed instruction, and educational television ... is truly inspiring."[86]

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[85] "EDUCOM Means Communication," *EDUCOM.* January, 1966. Vol. 1. Number 1. Inside Cover.

[86] "EDUCOM's Conference on Educational Communications," *EDUCOM.* May, 1966. Vol. 1. Number 5. Pp. 4.

At the same time, individual members of EDUCOM were busy with inter-campus networks of their own--networks that would channel and direct information to their students and faculty so they themselves could *process* it. "Today's students and faculty are confronted with an exponentially expanding amount of data that requires processing, synthesis, and understanding," the State University of New York's chapter of EDUCOM articulated their vision of networked information in higher education. In 1966, SUNY endeavored to solve their predicament by calling on the communications sciences, specifically, by approving plans to build an inter-campus communication network that included a closed-circuit television system, a time-sharing computer network (connecting 7 of SUNY's 58 campuses) and an arrangement linking together the records of several SUNY libraries. To SUNY and others, communications networks were the only way to update knowledge transmission and production in an era of information overload. A number of concerns hung in the balance. Learning was at stake. To SUNY, the most effective way to assist students in processing all the new information was to expand access to it--to put as much information as possible at the student's fingertips. "We believe that [various electronic technologies] make feasible the prospect of study terminals located in dormitories, in apartments, in libraries and in student unions," SUNY reported to EDUCOM, "so that the stored resources of the institution and its fact-transmitting systems can be available 24 hours a day throughout the entire university." But the effective and efficient transmission of ideas--up-to-the-minute research and scholarship--was also at stake: "The bibliographic knowledge, the demonstration recorded on video tape, the rare manuscript, the intellectual interaction of outstanding professors, must someday be transmitted rapidly and effectively throughout the whole system."[87] If students

[87] "New Ties that Bind SUNY," *EDUCOM.* April, 1966. Vol. 1. Number 4. Pp. 1.

and faculty in higher education--the producers and beneficiaries of new knowledge--were to process all the new data, information and recorded thought, channels of communication at and between colleges and universities would have to be as efficient as possible. Those channels (more than one commentator used the metaphor) would ideally buzz with information just like the objects of which they were extensions--the computer and the human brain.

Students were the intended end-point for much of the information traveling along these networks. A myriad of educational technologies were newly available to connect students to these inner- and inter-campus information systems. If the 1950s was the age of educational television, the 1960s was the era of advanced electronic educational technology, the decade when the electronics revolution reached campuses and classrooms. From the late 1950s forward, educational film and television were joined by a host of new, more cutting-edge information technologies: language laboratories, audio-listening centers, self-instructional "electronic" study carrels, computer-assisted instruction, teaching machines, talking typewriters, multi-media "electronic" classrooms and remote-access programmed instruction.

**Figure 2.4. Multimedia instructional laboratory at the University of Wisconsin-Madison. Source: Eds. James Brown and James W. Thorton. New Media in Higher Education. Association for Higher Education, Washington D.C., 1963. Pp. 115..**

More and more, students were engaging information of an electronic variety. The vast majority of everything they did still required texts, but increasingly, they were interacting with information by way of screens,

telewriters and headphones and connecting to it via remote-access. What's more, the accelerated pace of innovation and expansion between and across campuses, in addition to the overstated forecasts of educational technology advocates made it appear to students and educators alike that a significant portion of educational communication—of teaching and learning--was moving inextricably towards the transmission and presentation of information via these multimedia venues.

The use of established modes of educational technology--slides, film, television and audio—increased in classrooms throughout the 1960s, facilitated by a boom in the construction of new campus facilities throughout the decade. These were the years when standard projection equipment and multi-channel audio systems for in-class playback became a common feature of new lecture halls. Of course these modes were also continuously updated throughout the 1960s. On the far end of the spectrum, cutting-edge lecture halls, like that shown in Figure 7, were set up to employ split-screen technology, allowing instructors to juxtapose text, images and graphics. Lectures themselves could also be transmitted remotely by mid-decade, though only a few colleges employed the emerging technology. Generally referred to as tele-courses (tele in this case referring to telephone and not television) a few campuses began in 1965, transmitting lectures over two-way telephone connections to other colleges and universities or else to their own satellite campuses. What made these telecourses exciting to educators and administrators was a new technology called remote-blackboarding, electrowriters that transmitted what an instructor wrote or illustrated at his or her own location to remote sites. Made by Victor Electronics, the Victor Electrowriter Remote Blackboard (VERB) consisted of a writing pad and stylus. The stylus picked up electronic impulses which were transmitted by telephone connection to the receiver. The receiver consisted of a writing pad and an electronically

controlled stylus; the impressions were instantaneously received and projected onto a screen by a

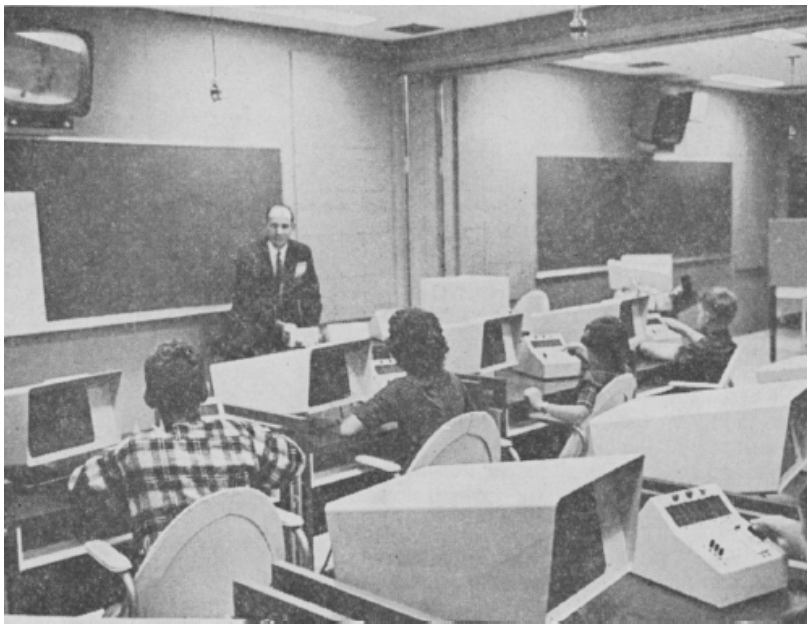

**Figure 2.5. Computer-Based Laboratory for Automated School System. Source: This Is CLASS (Computer-Based Laboratory for Automated School Systems). The Phi Delta Kappan, Vol. 43, No. 8 (May, 1962). Pp. 349.**

specially designed overhead projector which was connected to the receiver.

Perhaps the most significant innovation in educational technology in these years was the introduction of Computer Assisted Instruction (CAI). CAI was a process whereby instructional material was presented to students via a typewriter or cathode ray tube in a pre-programmed order. The software for such systems, called programmed instruction, was of two types: *branching* and *operant conditioning*. The first type, developed by psychologist Norman A. Crowder, constituted a kind of choose-your-own-your-adventure set of lessons. Each lesson ended with a test whereby incorrect answers would return students to prior points in the program to review material or else extrapolate on relevant material until a correct answer was achieved. The second type, developed by famed behaviorist B. F. Skinner, presented a sequence of

"frames," each frame containing only a small bit of information followed by a clear-cut question the student was unlikely to get wrong given the information presented (if more than 5% of questions were answered wrong, a programmed was revised). Each frame built on the small bit of understanding achieved in the prior frame so that the whole program "shaped" the students overall understanding of a subject or concept. Programmed instruction had been employed in other types of media, scrambled textbooks[88] and teaching machines, primarily in the 1950s. But CAI enjoyed a tremendous vogue in the early to late 1960s, with millions of dollars flowing from the federal government for research, development and training in the new technology. At first CAI systems consisted of one or two terminals connected to a nearby mainframe. But by the early 1960s, systems had been constructed which could control dozens of terminal situated in one classroom or laboratory. The first such system, developed by the Systems Development Corporation in 1961, also included monitoring equipment enabling teachers to observe any students performance from a main console (Figure 8). Within a few years, time sharing computing made possible the distribution of CAI terminals across a given campus, like the systems at SUNY. It also made possible inter-campus CAI systems. For example, in 1966 the National Science Foundation funded the Triangle Computing Center, a complex which linked together, Duke University, The University of North Carolina at Chapel Hill and


**Figure 2.6. Different multi-media devoces**

[88] "Scrambled Textbooks" or "Programmed Textbooks" contained quizzes on select material whereby students were instructed to turn to certain pages depending on whether they provided a correct answer to each question; an incorrect answer would usually direct the student to a page which re-explained material related to the question,

North Carolina State University. Students at any of the three campuses could dial up to a central mainframe a choose CAI lessons from several subject areas.

The popularity of CAI was part of a concurrent trend in educational technology in the 1960s towards the kind of self-instructional learning environments on display at Library 21 and Library/USA—the multimedia study carrel. Perhaps the main advantage hailed by advocates of programmed instruction, whether in teaching machines or CAI systems, was its capacity for "individualized instruction," its flexibility in allowing students to work at their own pace as well as the capacity of machines, by way of question-and-answer feedback mechanisms, to impart information suited to individual understanding. Indeed, many self-instructional study carrels, including those at Library 21 and Library/USA were equipped with teaching machines or CAI systems. In fact, the sheer variety of self-instructional multiple-media devices put on the market in these years attests to the scale of the attempted "electronification" of education (Figure 9).

Multimedia study carrels represented an end-point in the evolution of a related educational technology already in wide use in the late 1950s: language laboratories. Language laboratories became popular in the late 1950s as a way to combat teacher shortages in foreign language education. Laboratories typically included a few dozen study carrels each equipped with a tape player and headphones (Figure 10). They remained popular in the 1960s, though many were updated to include remote-access taped selections—students no longer needed to physically obtain tapes before sitting down to study, but instead selected lessons from a push-button console located in each carrel (Figure 11). By the early 1960s the use of audio-technology

**Figures 2.7 and 2.8. Both types of listening laboratories located at Duke University. (Left). Tape recorder is located in each study carrel. (Right). Tape recorders are centrally located and broadcast to study carrels. Source: AudioVisual Instruction. Dept. of Audiovisual Instruction, National Educational Association, Washington D.C. Dec 1964. Pp. x.**


**Figure 2.9. Datagram by North Electric. Source: AudioVisual Instruction. Dept. of Audiovisual Instruction, National Educational Association, Washington D.C. Sept 1965. Pp. x.**

in language laboratories was extended beyond language education to include pre-recorded lessons and lectures in all areas of study (see figures 2.7 through 2.9). 'Language laboratories' became increasingly referred to as 'listening laboratories.' In 1957 about 240 language

laboratories existed; in 1963 over 700 language and listening laboratories were in operation.[89] Just as with instructional television, within a few years of its emergence on the educational scene, the audio-technology used in these laboratories began to reveal opportunities unique to the medium. More and more, taped lectures were punctuated with recorded source material, interviews and news reports—they became, increasingly, assemblages of instruction and recorded media. *Time Magazine* described such "electronic teaching" this way:

> A coed slides into a plastic chair in a soft green three—sided cubicle, consults a mimeographed list, flips a switch, sees a red light blink, dials 1-2-2, pulls on earphones. Into the headset flows the voice of her political science professor, then Adlai Stevenson on the meaning of democracy, finally a discussion of freedom by New York University's Sidney Hook—and thus ends Lecture 1, Second Semester, Political Science 113. An electronic approach to teaching at M.I.T.? A far-out experiment at Goddard? Not at all. This is 15-year-old Oklahoma Christian College, a theologically conservative, Churches of Christ-run school, which, though academically obscure, has just opened the nation's first wholly electronic learning center. Each of Oklahoma Christian's 652 students has his own study carrel, tied to a computer that connects him in seconds to one of 46 tape playback machines. The system can transmit as many as 136 programs at once.

[89] Brown, James W. and James W. Thornton. New Media in Higher Education. Washington D.C.: Association for Higher Education and the Division of Audiovisual Instructional Service of the National Education Association. Pp. 86.

At Oklahoma Christian College, a full two-thirds of freshman and one-third of sophomore lectures were on tape by 1966. Ohio State University had the most robust remote-access audio system. Students there could dial for 8,000 separate programs from 75 courses in 13 departments and hear everything from a reading of Chaucer to a lesson in Chinese. By 1966, student calls into the system had reached a reported 40,000 each week.[90]

[90] Gilroy, harry. Electronics and Books: Merger Path. *New York Times.* Feb 6, 1966. Pp. 14.

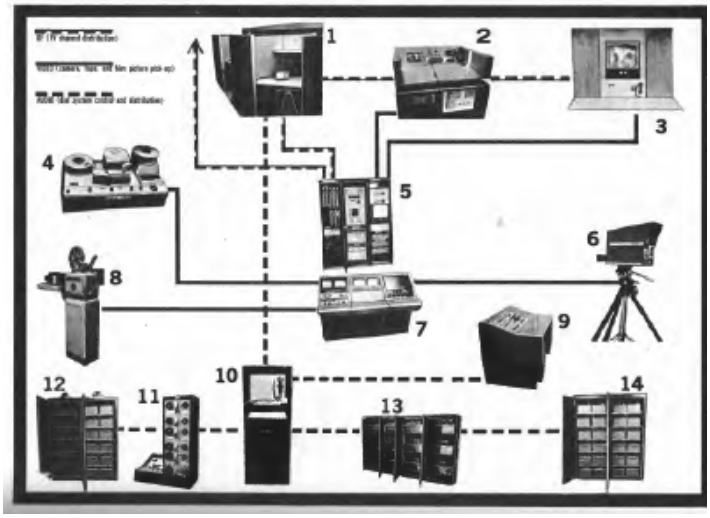


**Figure 2.10. Diagram of Grand Valley State College's ETV system. Source: Ed. Robert A. Weisgerber. Instructional Process and Media Innovation. Rand Mcnally & Company, Chicago, 1968. Pp. 398.**

Still, multimedia study carrels represented the fullest development in this area. In the early to mid-1960s, they began popping up around campuses across the nation. Some had isolated audiovisual equipment; others were networked into a centralized storage unit for audio, video and programmed instruction. Some were distributed throughout campuses; others were contained within a central laboratory or what were increasingly called, Learning Resources Centers. A full ten percent of colleges and universities surveyed by the National Association of Education's Department of Audiovisual Instruction in January of 1967 reported using some form of multimedia, self-instructional study unit. New campuses especially began investing heavily in the new technology, imaging a future where remote-access, multimedia instruction was central to the circulation of information on campuses. Three years after its establishment in 1960, for instance, Grand Valley State College in Grand Rapids, Michigan decided to organize their new campus around multimedia carrels. In the words of their Vice President for Academic Affairs and Dean of Faculty, they decided early on to "provide students with individual study booths or carrels" and that these carrels "would become each student's personal headquarters on campus … equipped to display audio and video materials distributed on the campus AV

system."[91] Having made such a decision early on, they were able to construct a completely wired-up campus, with a network of underground cables connecting nearly all facilities (Figure 2.10). Their campus contained 118 carrels, each capable of accessing 120 audio programs and eight closed-circuit television channels, all via coaxial cable. All auditoriums and lecture halls on campus could access the same material by the same means. Lectures could be recorded in any auditorium or lecture hall from a central control unit on campus (number 7 on Figure 2.10), stored centrally and then played back in any carrel or lecture hall in the future.

Advocates for educational technology often saw multimedia study carrels as the best way to plug students into the information explosion—the most effective and efficient way to get students to start processing the ever expanding record of human thought. Some focused again on the capacity of electronic technology to allow for individual differences in learning. Instead of keeping up with the rest of their class, slower learners could take the time to fully comprehend critical concepts. But of more interest to advocates of educational technology were advanced students, who correspondingly, could process the expanding body of information and recorded thought at an accelerated rate. With adjustable speeds, for instance, some argued that students could literally play information as fast as they could comprehend it. In this case, speeding up the learning process meant keeping up with the information explosion—a near obsession for advocates of educational technology in the 1960s. "The Knowledge Explosion is a very real problem for our new generation of students. And to help them cope with it, we must

[91] Potter, George. "Dial-Remote Access." In Ed. Robert A. Weisgerber. Instructional Process and Media Innovation. Rand Mcnally & Company, Chicago, 1968. Pp. 390.

speed the learning process," ran an ad in Time Magazine (April of 1966) for Sylvania Electronics, "Already, Sylvania is working with educators to project completely integrated systems of educational communications. Developing more sophisticated applications. Information "banks" that incorporate libraries on tape, capable of being comprehended at many times the speed of normal speech." Others argued that multimedia learning environments were, by their nature critically interactive. In promoting the national expansion of electronic educational technology in 1966, the Subcommittee on Economic Progress summarized the testimony of eight experts in this way:

> The student can control the speed of presentation in accordance with his own progress. The presentation can be in written form, through pictures, either moving or still, by voice, or by various combinations of these. Likewise, the student responses can be made by typewriter keyboard, by pressing buttons, or by simply pointing a wand at a tube.

Finally, others felt that multimedia self-instruction—and multimedia teaching in general—allowed students to process information communicated along multiple channels within the human sensorium. Film, television and audio-sequenced slides all combined sight and sound, but together with taped lectures, assigned texts and data-interactive teaching machines or CAI, multimedia study carrels were viewed by many educators, educational technologists, behavioral scientists and members of the electronics industry as cutting-edge human-machine information systems.

## IV. Educational Technology as Cybernetic Vision: The Social Sciences

As the electronic revolution in education took hold, educational technologists, or rather audiovisual specialists, as they were more often referred to in the late 1950s and early 1960s, found themselves in a unique position. The rapid influx of new cutting-edge electronic educational technology combined with the prevalence of cybernetic theory in these years allowed practitioners in the field of audiovisual education to accomplish a number of needed goals. Once again, that critical moment when the purposes, meanings and exact uses of a new genre of technology are initially unsettled, allowed an invested group to use it for their purposes. On the one hand, the "electronic revolution in education" allowed audiovisual specialists to cast their field as a professional enterprise by giving it the robust theoretical underpinning it had, according to the majority of its practitioners, always lacked. The nature of cybernetic theory, in particular, allowed audiovisual specialists to cast themselves as builders of complex information systems. No longer were they mere providers of slides and projectors to teachers in need, they were system builders, or "audiovisual engineers" as they began to call themselves.

On the other hand, by defining their field, and thus their professional expertise, along cybernetic lines they began to attain the influence necessary to enter into an ongoing discourse of the 1960s—a discourse which attempted to redefine "man and machine," and more specifically, humankind's relationship to information and its technologies. Educational technology, and its specialists played a key role here, one overlooked in the literature on the history of popular cybernetics. All automated technology in the 1960s became a way to promote a new symbiotic vision of "man and machine." But educational technology, in particular, educational technologist and others averred, situated in a learning environment, demonstrated the degree to which

humans, machines and the information that passed between them, were essentially cybernetic in nature.

Complex cybernetic systems began with the work of Norbert Weiner in World War II. Starting in 1942, Wiener was commissioned by the U.S. government to design and construct an automatic predicting and targeting mechanism for anti-aircraft gunnery. The system he built took in data corresponding to a plane's flight path at prior points, extrapolated to the plane's future position at a predicted point, and then took into account the "error message," or the difference between its own prediction and the actual position of the plane, to reformulate the next (and more finely tuned) predicted point. Uncanny in its predictive powers the system was even able to stand up to pilots' evasive actions. Unfortunately, by the time Weiner had designed a system capable of accurately predicting with a lead time of 3-4 seconds (the period of time needed for artillery to reach a target in the air) the war was all but over.

After the war cybernetic *theory* flourished as practitioners in multiple fields--anthropology, psychology, information theory, control systems, mass communication, mechanical engineering, biology, electrical network theory and neuroscience--became increasingly aware that the concept of feedback was central to the systems they were investigating. The cross-disciplinary character of cybernetic theory began during the War when stunning similarities emerged between Wiener's own work and that of Warren McCulloch, a neurophysiologist at the University of Illinois and one of the world's leading authorities on the brain. First by correspondence and then in person, the two realized they were both working with systems governed by the same process: systems where information continuously looped back to its source in order to reveal whether and to what degree the system was off the mark from its intended goal and thus what corrections were needed for the system to reach that goal. For

instance, Wiener learned from McCulloch that his greatest challenge in constructing his anti-aircraft gunnery system revealed fundamental similarities between humans and machines. Wiener's gunnery mechanism was initially prone to "violent oscillations" at certain points, a result of the mechanism getting stuck in an over-correcting routine. According to McCulloch, this exact mechanism was present in people afflicted with purpose tremor and Parkinson's disease; the nerves responsible for movement in a given limb continuously dispatched "error messages" such that the limb relentlessly overcorrected, resulting in uncontrollable oscillation of the limb.

Immediately after the War the Wiener and McCulloch initiated a series of conferences--the Macy Conferences--where the science of cybernetics was born. From 1946 to 1953 the conferences were regularly attended by the likes of John von Neumann the world's most renowned computer architect of the day, biophysicist Heinz von Foerster, sociologist and pioneer of mass communication studies, Paul Lazarsfeld, psychologist and founder of social psychology, Kurt Lewin, and famed anthropologists, Gregory Bateson and Margaret Mead. In short, post-war cybernetic theory was essentially an attempt to apply the logical calculus and statistical mechanics of cutting-edge information theory to the organization of social, cultural, mechanical and biological entities--for instance, the nervous system, servo-mechanisms, Bell Telephone lines, media influence and the function of ritual. It was an attempt, in other words, to place the process of signal and message at the heart of all social and living systems while employing precise mathematical models of "logical circularity" (feedback) to explain the more complex features of those systems. Thus, for instance, sociologists like Lazarsfeld, Robert Merton and Talcott Parsons could employ the model of feedback to explain with better precision the circular impact of social factors and how social homeostasis was achieved and maintained.

**Figure 2.11 . From Trask, Maurice. The Story of Cybernetics. E. P. Dutton and Co, New York: 1971. Pp16.**

Ultimately the interdisciplinary character of cybernetics did not hold up and in some ways these heady days of cybernetic theory were a post-war positivist dream fated for disappointment. But what came out of this multi-field effort and what remains today is the notion that information processes are at the heart of both humans and machines. Cybernetics was, from the beginning, conceived of and employed to describe both mechanical and living processes. This facet in particular was alarming when, in the late 1950s and early 1960s, the increased use of computers and automated machinery began replacing workers. To many, cybernetics was disturbing because it was based on the principle by which all living organisms were self-regulating, self-directing and responsive to their external environment—feedback of information. The authors of the popular literature on cybernetics which emerged in these years never tired of

making this connection explicit—often juxtaposing pictures of babies, animals and machines (see figure 4). "This self-regulation by feedback, the 'closed loop', is found in all cybernetic processes," one text instructed, "living, natural, mechanical … studious children [and] living animals."[92] The lesson was there: cybernetic machinery did not just accomplish human tasks by way of a process more suitable to machines (the way that hydraulics substitute for human muscular activity but in no way imitate how muscles work), it did so via *the same internal processes of humans* and all living things.

The popularity of cybernetics in the 1960s, both within and without academia, made the concept of information interface between humans and machines particularly intriguing. As one can imagine, educational technology was an arena where this new fascination played itself out. In fact, the sheer variety of new instructional media in the 1960s was only part of what set the arena of educational technology in these years apart from its analog in prior periods. Perhaps more critical was the newly dominant role of communications theory, behavioral science, and systems engineering in the research, development and theoretical rationale behind educational technology in these years. In the early 1960s, the professional field of audio-visual instruction, influenced by thinking in the novel fields of computer science, communications and cybernetics, experienced a reorientation away from a concern with visual aids in the classroom towards a more comprehensive theory of human-machine systems. This reorientation made the field considerably more amenable to the work of behavioral scientists, systems engineers and the electronics industry, all of whom became intimately involved in the construction of educational technology in the 1960s. In 1963 the field attempted to formalize this reorientation with the release of the definitional work, *The Changing Role of the Audiovisual Process in Education: A*

[92] Trask, Maurice. *The Story of Cybernetics*. New York: E. P. Dutton and Co, 1971. Pg. 16-17.

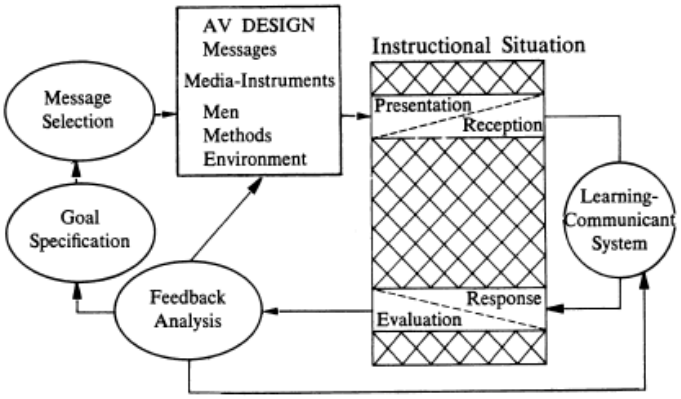


**Figure 2.12. Diagram of "AV relationship to the educational-communicant process." Source: *The Changing Role of the Audiovisual Process in Education: A Definition and Glossary of Related Terms.* Pp. 25.**

*Definition and Glossary of Related Terms*, sponsored by the Division of Audio-Visual Instruction of the National Education Association and authored by three of the field's architects, James Finn, Donald Bushnell and Donald Ely. Their work can be read on one level as an effort to put the field, for the first time, on a solid theoretical footing. Imbibing a healthy amount of cybernetic-inspired communications theory from works such as Claude Simon and Warren Weaver's touchtone, *Mathematical Theory of Communication* (1949), the authors, for instance, cast off the field's prior focus on *things*—visual and instructional aids—and asserted a more sophisticated underpinning to their domain, the *process* of information transmission; messages and feedback within "educational-communicant systems" (Figure 11). "Audiovisual communications" was now:

> that branch of educational theory and practice concerned primarily with the design and use of messages which control the learning process. It undertakes

> …the structuring and systematizing of messages by men and instruments in an educational environment. These undertakings include the planning, production, selection, management, and utilization of both components and entire instructional systems. Its practical goal is the efficient utilization of every method and medium of communication which can contribute to the development of the learner's full potential.

The 1963 definition characterized educational technology as a process—a process in which analysis and implementation and led top complex man-machine systems to deliver instruction.

This new orientation had two important features for our purposes here. First, it treated humans and machines, at least those capable of responding to input, as mutual communicants in an educational-communicant system. Both were senders and receivers of messages and thus "designated communicants." Communicants were "complementary organisms which operate within an optimal linkage situation," that is, the overall design of a learning environment was meant to make optimal communication linkages, between educators, instructional material, students and equipment: "Optimal linkage is designed to show the mutual roles of communicants in the transmission of messages." Second, this new emphasis on the total process of communication included a "systems approach" to instructional design. Using the communications model outlined above, an effort was made to forecast the most effective way to transmit information to, and thus elicit the proper response from, the learner given the total set of interrelating elements in the educational-communicant system. "The task of the audiovisual specialist may be described as assistance in the appropriate design of a presentation which utilizes the elements of messages, media-instrumentation, men, methods, and environment," the

authors instructed, "The appropriate combination of these elements implies a systems approach." *The Changing Role of the Audiovisual Process in Education* merely codified a transformation already taking place in the field. Audiovisual specialists, who ten years prior, had focused on acquiring visual aids for schools based mostly on their content (e.g. history, math or spelling), were more and more educated in information systems theory and applying a systems approach regarding the arrangement of multiple media equipment. Practitioners in the field, for instance, began to increasingly refer to themselves as "audiovisual engineers."

Generally speaking, educational technologists were committed to the notion that instructional technology was the clearest demonstration of the essential cybernetic connection between humans and machines. Just as the nature of educational technology in the 1960s offered audiovisual specialists the opportunity to add a theoretical foundation (of cybernetics) to their hands-on enterprise, it also allowed them the opportunity to thrust their breed of technology into the center of discussion surrounding the philosophical implications of new "man-machine systems" in these years. As the intellectual custodians and sometimes creators of this new genre of technology, they found themselves in a new position of authority to comment on humankind's relationship to information and technology, a relationship which, though always in flux, was rapidly changing in these years.

We are so used to characterizing the 1960s as a period of social and cultural disruption that we sometimes forget the massive techno-scientific output of the decade. Such advancements had their own modes of disruption--unemployment, the rise of a technical elite and, most relevant here, a new discourse on the relationship between humans and machines. The decade witnessed two parallel and accelerating trends: the humanization of technology and the technologization of humans. On the one hand, widespread computerization, artificial

intelligence, talk of cyborgs and cybernetic systems and theory all signified machines' new and significant incursions into the sacred territories of organic life and mind. On the other hand, a host of bio-technological innovations--prostatic fingers and limbs, plastic heart valves and arteries, bionics, the rapid rise of biochemical 'mood correctors,' and most of all, the possibility of genetic coding--all signaled humankind's latest and most profound foray into a world of technologized life.

Educational technology featured prominently in this shift. In some ways, obscure research in artificial intelligence—for instance, getting mobile machines to seek out electric outlets or programs to erect structures with building blocks—wasn't as compelling to the popular imagination as "intelligent artificial teachers," machines which "talked," or communicated learning materials to humans based on their real-time input. [93] The latter were not only designed to directly affect, and in some cases, mirror, how humans think, but humans actually "plugged into" them. For this reason, to many, educational technology, and computer aided instruction in particular, became the most compelling example of the growing similarities and interdependence between humans and machines. In fact, one finds that the popular press in the United States seized on the image of students "plugging into" machines as the best way to showcase the radical nature of the "cybernetic era." "There are 1,000 students, each plugged into the mother computer. They are studying eight different lessons. Each of the students is having a 'dialogue' with the computer through two sets of electronic keys" the *New York Herald-Tribune* reported in typical fashion 1964. Educational technologists, in particular, never tired of promoting just this vision of their technology. Students wired up to electronic equipment, taking in information at

[93] "UConn Project Seeks Artificial Teaching Device," *The Hartford Courant* (Sep 10, 1970): 68.

greater speeds and efficacy than ever before (or so they believed) signaled, they hoped, that educational technology was the central machinery in the new era of "man-machine information systems."

**V. Educational Technology as Futurological Trope: The Electronics Industry**

The new social scientific and systems engineering approach to audiovisual instruction made the field of educational technology incredibly amenable to the method and manner of the electronics industry who, in the mid-1960s, moved full force into the world of education. From the early to late 1960s, with few exceptions, every major electronics manufacturer in the United States began to invest in the research, development and production of educational technologies. Xerox, R.C.A., Raytheon, Sylvania, Victor, General Electric, I.B.M., Honeywell, Remington Rand, Burroughs, Digital Equipment, Westinghouse and Philco-Ford—essentially, the nation's entire electronics industry moved en mass into the schoolroom.

In one sense, they did it for the money. Education was a booming industry. Direct expenditures for formal education in elementary schools, high schools, and colleges increased from $18 billion a year in 1955 to $40 billion in 1966. By 1975, that number was an expected to increase another 50% to $60 billion. Increased enrollments were only part of the reason. Total enrollment in U.S. educational institutions did rise from 36 million in 1954 to 53 million in 1964 and was expected to reach 63 million by 1975. But at the same time, annual expenditures per pupil in public elementary and secondary schools increased from $321 per pupil in 1954-55 to $478 in 1964-65, and were expected to increase to $660 by 1974-75 while the annual cost per student in institutions of higher learning rose from $881 in 1954-55 to $1,220 in 1964-65, and

was expected to climb to $1,537 in 1974-75. In 1966, experts estimated that the educational technology market in the United States was somewhere around $500 million a year, while predicting that it would rise markedly in the next decade to $5 or $10 billion. Indeed, the federal government alone was shelling out 1 billion a year by 1966 towards educational innovation, with 200 million of that going directly to hardware development.

Once inside the classroom, industry took the position that they were there to save education. The tone of industry leaders when addressing educators, often indicated that they felt they had been called on by the government and by detractors of modern schooling to apply the prowess of their technical know-how and "systems thinking" to the large-scale problems of the nation's educational system. "It is characteristic of our economy to meet new challenges with more effective technology," John Stark, deputy director of the Joint Economic Committee, framed it historically, "When our historical development required breakthroughs in transportation and communications, to name two important sectors, it was technical innovation that made them possible. It is not surprising to discover mounting enthusiasm among educators for the possibilities of applying our rapidly developing communications technology to education."[94] Deficiencies in the nation's educational system—whole uneducated sectors of society, poor national test scores, the inability of educators to keep up with the information explosion, even the inability to successfully transmit traditional values to the next generation at a time of social upheaval —were often blamed on the technological backwardness of education. Some even compared education to a third world country, whose folk culture has successfully resisted modernization. "The aircraft industry would go out of business in 2 years if it changed as slowly as education" one industry leader stated before the Joint Economic Committee.

[94] Educational Technology: a Communications Problem, 196

To their credit, industry leaders did often attempt to allay educator's fears by stressing the need for cooperation and collaboration. "The goal, of course, is to build a working relationship between schools and industry so that together we can plan, carry out, and evaluate efforts aimed at improving education," assured Edward Katzenbach, vice president of Raytheon's Education Division.[95] But they did so with some arrogance. After only a few years working in the area of education, industry leaders again and again felt comfortable telling lifelong educators that the progress of education in America now depended on their getting along with engineers and businessmen.

> Industry is strongly committed to utilize its broad technological knowledge; its administrative, engineering, and systems analysis talent; its research and development and manufacturing resources; and its energy in helping to improve education. If these resources are to be skillfully applied … a close working relationship between industry and the academic community must be developed. The continuing and accelerated progress of education in America may well, in fact, depend upon this relationship.[96]

What recourses did industry have? More than just educational technology. For with educational technology came "systems analysis." Systems analysis was, according to another exec in Raytheon's Education Division, "the application of scientific methods and tools to the prediction and comparison of the values, effectiveness, and costs of a set of alternative courses of

[95] Katzenbach, Edward L. "Industry Can Serve," The Phi Delta Kappan, Vol. 48, No. 5 (Jan., 1967). Pp. 191.

[96] Ibid. pp. 193-94.

action involving man-machine systems."[97] In other words, it was a way to forecast and thus properly design and implement the assembly of a multitude of resources geared towards a broad objective, in this case and educational objective. But in the end, the electronic industry's brand of systems analysis, as they themselves articulated it to educators, essentially called for industrial solutions, specifically the design of "new and exciting" combinations and re-combinations of various educational media components. When the electronics industry talked of "systems analysis" in education, more often than not, they meant figuring out which media components should be used in what order or what configuration to effectively convey a subject or concept. When for instance, should CAI as opposed to multimedia instruction be employed in an overall system? In fact, members of industry often expressed their expectation that educators would one day become something like information councilors, primarily training students to properly employ, and discriminate between, various sources of ubiquitous informational media. "Educational technology may require profound changes in the teacher's role," assured Katzenbach, "from that of classroom instruction to that of including the much broader duties of 'orchestrating' an array of new teaching tools."[98] Whether with apprehension or optimism, many educators had similar expectations. In a world where information was everywhere—in print, on your home television, on computers, at the other end of your telephone line, in the air, and who knows where else in the future—students may need, more than anything else, to know how to manage information sources. "I rather think the term 'classroom teacher' will soon be a misnomer, if it is not already so," argued Lois Edinger, president of the National Education Association in in trying to reassure educators that educational technology was not meant to

[97] Meals, Donald W. "Heuristic Models for Systems Planning," The Phi Delta Kappan, Vol. 48, No. 5 (Jan., 1967). Pp. 202.

[98] "Industry can serve," 191.

displace teachers so much as alter their overall function, "for the teacher will no longer be confined to a classroom ... No longer will we think of the classroom in its traditional box shape. Indeed, we may soon call the teacher a manager of learning resources in an instructional resources center."[99]

Thus, there were any number of professed reasons why the electronics industry moved full force into education in these years. On the one hand, increased funding for educational research and development made it quite lucrative. On the other hand, many, including those in the electronics industry, believed they had both the equipment and the analytical, engineering and organizational tools necessary to solve education's mounting problems. But beyond and behind official reports, industry advertisements and published discourse on the matter was a subtext which can be read to reveal another of the electronic industry's aims in promoting the necessity of educational technology. Materially, the electronics industry hoped to use educational technology to force a near total shift towards the electronic transmission and display of communications and information more generally. Rhetorically, they hoped to use their promotion of educational technology to initially market the idea that print media would rapidly and inevitably be superseded by electronic, specifically screen-based, media, because the former had a low fidelity to realty. The degree to which media mediates, the electronics industry implicitly argued in their publicity of instructional technology, was the mark of its efficiency and effectiveness. Media which mediates least, media that is able to bring reality or near-reality from afar to its user, something print simply could not do, would and should necessarily displace

[99] Keppel, Francis. "The Business Interest in Education," The Phi Delta Kappan, Vol. 48, No. 5 (Jan., 1967). Pp. 189.

previous representational technologies. It was, for the electronic industry, a simple story of technological supersession.


**Figure 2.13. Boy's Life, "The Telephone of Tomorrow." November, 1962. Pp. 2.**

Of course, members of the electronics industry were not the only ones in these years who promoted such a vision of total media supersession. The 1960s was, after all, an age of futurological tropes, visual cues and narrative themes which signal to audiences that they're looking at or reading about the future. Automatic sliding doors, flying cars and talking computers appeared everywhere in movies, television and advertisements in these years. Granted, each of these devices already existed in the American imagination, but in the 1960s they became nearly

ubiquitous in depicting the future. Another such trope was the screen, or more specifically, screen based communications and information retrieval. In the 1960s this trope began to appear everywhere. These were the years when characters on the Jetsons, Star Trek, Voyage to the Bottom of the Sea, to name just a few, were immersed in a high-tech audio-visual communications environment whose most superior, and therefore ubiquitous, expression was the screen.

Industry obviously had a hand in pushing this trope into the popular imagination. Futurological tropes became a hallmark of industry advertising and promotion in the 1960s. It was in this decade that the electronics industry began to spend considerable energy selling imaginative and speculative visions of a technological future—promotional material which contained no existing product, but instead, an conceptual vision of how electronic technology, in particular, would vastly improve life in the near future. The heady days of the 1960s inspired a rapid upsurge in the promotion of what might be called, industrial-electronic futurism by electronics firms. Bell Labs was a forerunner here. In 1962, for instance, they ran a series of ads in *Boys Life* on "The Telephone of Tomorrow." Future Telephones included, predictably, car phones. But most often they incorporated a screen: a picture phone for business use and, as always in industrial futurism of the 1960s, one for educational use. In this particular ad, a television/printer allows a child in traction to be "instructed at home from a central education center." Bell Labs also released to theaters in 1962

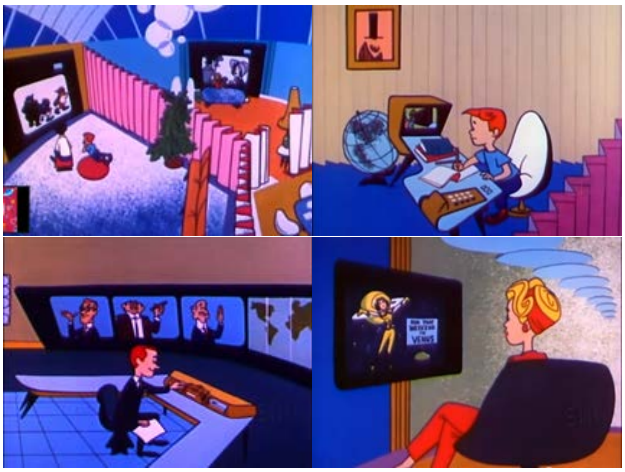

**Figure 2.14.Bell Labs, "Talking of Tomorrow," 1962.**

"Talking of Tomorrow," a short animated film directed by Jetsons writer, Chuck Couch. In this film, Bell Labs computer Cybil (which also makes an appearance in the Boy's Life ad above) predicts the future world of 2000. Once again, all communication and informational activities take place on screens: education, shopping, business and entertainment.

Perhaps, most famously, in 1967 Ford-Philco released a short film, "1999 AD" for Philco's 75th anniversary. Philco was an electronics firm which, though forgotten today, made radios, televisions and refrigerators for the first half of the twentieth century (Ford bought Philco in 1961). In the 1960s they moved into the realm of computers, and for a short time were a key player in advanced electronics, building components for NASA and NORAD in these years. "1999 AD" is typical of industrial-electronic futurism in these years in that every scene—every single activity depicted—involves human engagement with audio-visual information on a screen (figure 2.15). The husband's office, perhaps most obviously, involves multiple screens for simultaneous video conferencing and information retrieval as well as paying bills. Even cooking in the future is facilitated by accessing recipes from a monitor. After obtaining her recipe, the wife is not done—there is more of the world to engage from her console. She switches gears: shopping on the main screen while monitoring her children play via a closed circuit system on a secondary screen. Even a child playing chess in his spare time and entertaining with friends, must somehow, almost by necessity, involve interaction with a screen. Finally, as always in industrial-electronic futurism in these years, a child's education takes place via a multitude of audio-visual equipment, essentially, a selection of differently sized screens—one large enough to almost bring the moon landing directly into his study room.

Thus, in some ways, the electronics industry was simply playing into and helping to advance more popular notions concerning the ultimate fate of print and the unstoppable ascendency of a screen-based, audio-visual culture. But, as we'll see, the electronics industry was in a place to not just to promote such a vision of a new media regime, but they were in a place to try to install it—and educational technology, I'm arguing, was the realm where they first sought to do both.

Figure 2.15.Ford-Philco, "Year *1999* A.D.," 1967.

Industry moved into education because they regarded the campus and classroom as key arenas in which to work out the development and implementation of cutting-edge information transmission systems. In particular, the electronics industry believed that education was the first arena where information transmission would move, on a large scale, beyond the bound book and towards electronic systems. This particular vision was, in fact, behind a sudden spate of large-scale mergers, acquisitions and joint ventures between the nation's leading electronics firms and publishing houses specializing in educational material in the middle 1960s. In 1964, IBM

acquired Science Research Associates, a company specializing in programmed instructional materials while R.C.A. made public negotiations to purchase Prentice Hall, a large publisher of textbooks. Talks between R.C.A. and Prentice Hall fell through in April of 1965, but meanwhile a number of other firms were negotiating similar arrangements. In the summer of 1965, Xerox purchased American Educational Publications and in 1966, Litton Industries acquired the American Book Company, a publisher of elementary, high school and college textbooks and educational records. In that same year, Raytheon Inc. purchased D.C. Heath, another textbook concern and in March, R.C.A. ended up acquiring Random House, the largest of these electronics and publishing arrangements. Joint research ventures between electronics and publishing interests were also popular. In the fall of 1965, General Electric and Time Inc. formed a joint company, the General Learning Company, to produce educational materials, systems and services. The next year, Sylvania Electronics and the Reader's Digest Association announced a joint group to investigate the potential of electronic systems in education. Alongside these more conspicuous, large-scale transactions, other partnerships were being formed. By 1968, this "rash of mergers of 'hardware' and 'software' companies" included over one hundred new partnerships.[100]

At the center of these deals, at least implicitly, was a kind of core formula, a formula that, according to Alan Stein, partner at Goldman, Sachs & Co., even investment houses were counting on: in the future, at least in education, publishers would be responsible for producing content and the electronics industry would be responsible for producing the equipment which transmitted that content. Even Bennet Cerf, president of Random House could get behind such

[100] Sharpes, Donald K. "Computers in Education." The Clearing House. Vol. 43, No. 3, Nov., 1968. Pp. 135. Behrens, Carl. "Publishing Goes Electronic." Science News, Vol. 92, No. 2, Jul., 1967. Pp. 44.

synergy. “Publishing and electronics are natural partners,” he argued at the time of his and R.C.A’s merger, “With the revolution in education that is expected in the next ten years, R.C.A. has the equipment that will be used and we have the books.”[101] On the surface, at least, everyone appeared to be in agreement. George Haller, president of General Electric, characterized publishers as “the people who can collect and present learning materials,” while arguing that systems engineers can “do a better job of transmitting the material.”[102] Both groups had reason to be happy about these ventures. The electronics industry needed educational content—well written, edited content—for their instructional systems. Members of the publishing industry who specialized in educational material—the most profitable field of publishing—perhaps convinced that educational material was destined to be transmitted electronically, felt they needed a partner in the electronics industry to stay competitive.

Others were not so sure. In May of 1966, the American Book Publishing Council held a panel discussion with members of the electronics industry to ask them point blank why they were “interested in the book business.” Some feared that educational publishing was only the beginning, that the electronics industry would move inextricably into all areas of traditional text production. Representatives of General Electric and IBM did little to allay such fears at the Council meeting. When asked by the audience of publishers what kind of hardware would transmit the contents of printed material in the future, both representatives talked of a futuristic world where the codex would be nearly irrelevant. D.V. Newton of IBM talked about artificial intelligence programs that would soon determine a student’s learning deficiencies before teaching them, simply by conversing with the student, something a book could never do; George

[101] Gilroy, Harry. “Electronics and Books: Merger Path,” New York Times, Feb 6, 1966. Pp. F1.

[102] Gilroy, Harry. “Newest Bookman Program the Future,” The New York Times. May 27, 1966. Pp. 40.

Haller talked about a point in time when a device could be used to pass information directly from one brain to another.

Such fears were not unwarranted. On the one hand, the electronics industry undoubtedly had the expansion of educational communications systems in mind when they acquired these publishing houses. They had, for instance, designs on the American home. When Alfred C. Edwards, president of Holt, Rinehart and Winston, was approached by a "leading electronics executive," he was told that the firm wanted to "take information out of a book, put it on audio-visual tapes and then … bring the information into homes and schools." Edwards, who turned down their offer, reportedly asked the executive, "Doesn't a book do that already?" At the time of its merger with Random House, R.C.A. was in the process of developing a machine that transmitted printed material—text and images—by way of television sets (Figure 12).

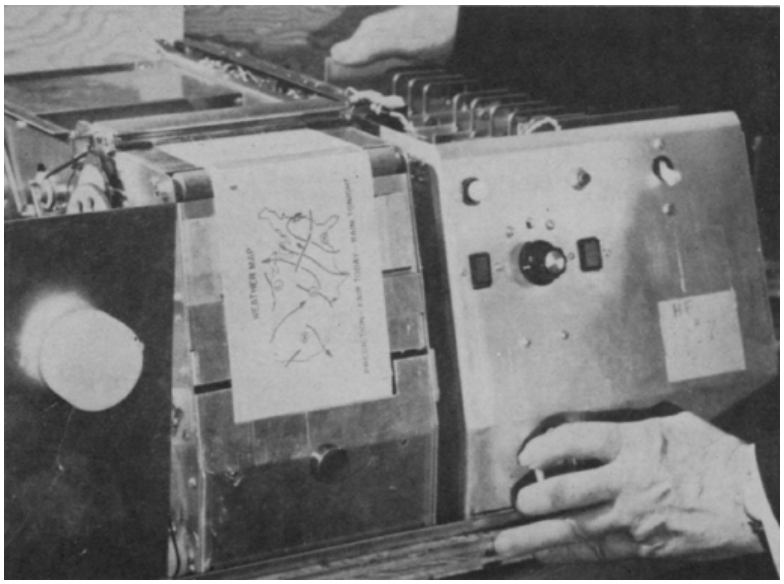

**Figure 2.16. RCA home-facsimile system. Source: Behrens, Carl. "Publishing Goes Electronic," Science News, Vol. 92, No. 2 (Jul. 8, 1967). Pp. 44.**

***The Changing Role of the Audiovisual Process in Education: A***

In yet another example that the television, as a networked electronic device, was initially offered as a viable alternative to the computer for managing the information explosion, six prototypes existed in 1966 and each could successfully transmit a paperback sized page of material in 10 seconds. Customers would ultimately choose between 14 options "scheduled" each day. They would turn a switch to one of 14 points and the corresponding material would be transmitted over the FCC controlled airwaves to their printer. Among the material listed by James Hillier, vice president of R.C.A Laboratories, for possible transmission was news briefs, sports scores, stock market reports, TV program schedules, syndicated columns, news magazines and presidential addresses. Also included was printed material to accompany educational television programs. In the middle-1960s, Sarnoff envisioned this device, or something like it, at the heart of future information transmission. "A true communications revolution," was coming, he said in 1966, "[where] the telephone, record and tape player, radio, TV, and film projector [will be] merged into one unit that will also publish magazines, and newspapers in your home."

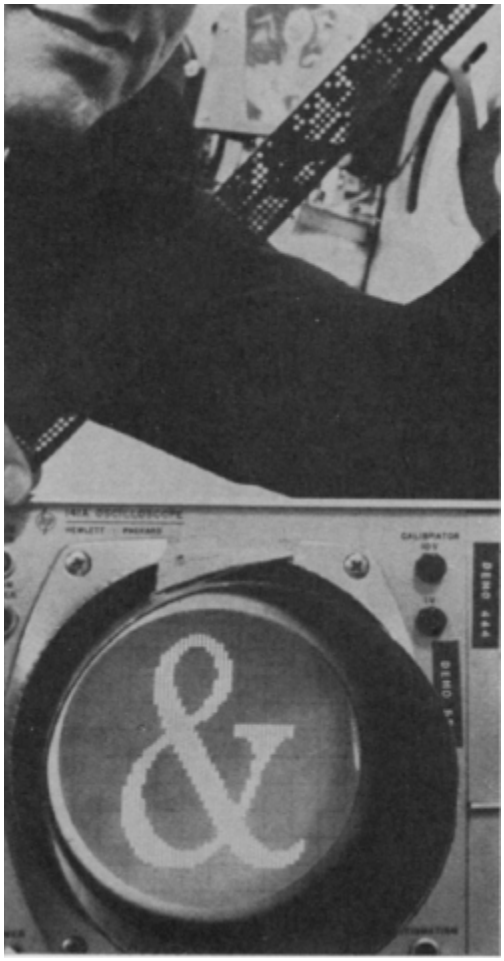

**Figure 2.17. RCA electronic typesetting. Source: Behrens, Carl. "Publishing Goes Electronic," Science News, Vol. 92, No. 2 (Jul. 8, 1967). Pp. 44.**

On the other hand, some members of the electronics industry clearly felt that the realm of education was only a first step, that one day soon, a good portion of content traditionally destined for print would be communicated

electronically. George Haller, president of General Electric, rather arrogantly declared to the audience at the American Book Publishing Council meeting that the function of their profession would soon be narrowed to fit technological trends: "We are not interested in the book business, we are interested mainly in the information business. I predict that you people will be chiefly information publishers in the future."[103] R.C.A. clearly envisioned a future where a good deal of published material would end up in electronic systems. Their newly formed "Graphic Systems" division, the division which absorbed Random House, was primarily responsible for designing electronic systems capable of converting printed material into information which could be displayed by a computer onto a cathode ray tube screen (Figure 13). In short, the "Graphic Systems" division was among the first in the nation to develop a method of turning computer memory of a text (inputted in the form of paper or magnetic tape) into a CRT display of that text on a computer screen. One could, for the first time, create a paper tape of a text—any text—by punching out spaces on the tape corresponding to given letters, numbers and punctuation; each punched space would tell the computer to render on a CRT screen, a specific graphic representation, stored in its memory, of a letter, number or punctuation mark. R.C.A. marketed this process to printers as the Videocomp phototypesetter, but they had larger futuristic designs on this breakthrough technology. The central project of the "Graphic Systems" division was the development of "electronic libraries in which all types of printed information could be stored electronically and retrieved immediately." In short, RCA and other electronic firms, imagined that one day soon, whether with the computer at the center or not, the myriad of new electronic

[103] Gilroy, Harry. "Newest Bookman Program the Future," The New York Times. May 27, 1966. Pp. 40.

networks and devices would be configured in such a way as to transmit all information more effectively. The arena of education was clearly just a start.

**VI. Educational Technology and Crisis: The Humanities**

Together these two visions of educational technology in the 1960s show the degree to which the specific import of these new systems was up for grabs in these years and thus the degree to which invested groups could endeavor to assign to them particular values and meanings. Into this mix, humanists, and in particular, socio-technical humanists arrived. The redefinition of humankind's relationship to technology and information by educational technologists and social scientists in general, a redefinition which sought to solve the information explosion by simply increasing the efficiency of message and signal between humans and machines was threatening to humanists on its own account. To the custodians of print culture, the use of educational technology by the electronics industry to aggressively promote and install a post-print world was menacing on yet another front. Many humanists commentating on the situation, from Lewis Mumford to Joseph Wood Krutch, took both of these threats to be at the heart of the humanities crisis. Other humanists—what I'm calling socio-technical humanists—from Neil Postman to countless unnamed electronic adopters, instead sought, as we'll see, to use educational technology to respond to the information explosion in uniquely humanistic ways, by wedding the new technologies to both traditional and reformist humanistic aims. In doing so they sought to defend and update the humanities enterprise. Educational technology, they argued, allowed humanists to speak directly to students' real world experiences—to "what it means to be

human in today's world"—to guide the critical uses of new media generally and thus ultimately to make the humanities more publically engaged and socially relevant.

## Chapter 3 || Instructional Media and the Socio-Technical Humanities

It goes without saying that many humanists resisted the incursion of electronic technology into the realm of education. Instructional media, especially its 1960s variant, born of cybernetic and behaviorist thinking and instituted by engineers and industry executives, represented a double incursion—the wholesale application of social scientific and mechanical engineering principles to the process of learning. Many argued that it "dehumanized" or "alienated" students. Others argued that electronic devices only fed factual material to students and thus bolstered the growing emphasis on practical-oriented, career-focused instruction in American education. Lewis Mumford, historian and longtime critic of the authoritarian impulse in modern technological thinking, argued that the expanding use of educational technology provided the greatest evidence of a general shift towards the automation of knowledge, and ultimately, the automation of the human organism. "Shall we extend the processes of automation into every department of our lives," he asked the audience of the 19th National Conference on Higher Education in 1964, "Unless we tackle this question swiftly, we shall soon find that the last word in automation is Automatic Man."[104] To Mumford and many other educators at the time, the introduction of educational technology signaled the latest incursion of cybernetic automation into human affairs; education was now joining the realms of manufacturing, finance and the wide-ranging field of data management. Mumford bristled under this further encroachment:

[104] Mumford, Lewis. "The Automation of Knowledge." *The New Technology and Human Values*. Ed. John G Burke. Belmont, Calif., Wadsworth Pub. Co., 1966. Pp. 86-87.

> As the facilities of our educational institutions expand with their nuclear reactors, their cybernetic IBM machines, their computers, their television sets and tape recorders and learning machines, their machine-marked yes or no examination papers--the human contents necessarily shrink, for the very presence of the human personality disturbs this complex mechanism which operates increasingly as a single unit and can be managed efficiently only by remote control under centralized direction.[105]

If the mechanization and systemization of learning and thinking was an issue with the coming of automated information storage and transmission in education, so too was the status of print. As the standard guardians of print culture, discord emerged among humanists about how to view the possible migration of culture into electronic formats. On one end of the spectrum were those like Joseph Wood Krutch who refused to leave the Gutenberg era quietly. "The printed page is the most important means of communication ever invented and any student who does not learn how to take full advantage of it has failed to learn the most important thing schooling can teach," Krutch declared in 1969, "Teaching machines and 'audio-visual aids' have their place, but they are impediments to continuing education if they diminish the student's ability to give proper attention to the printed word."[106] On the other end was a different kind of humanities scholar, perhaps best represented by Marshall McLuhan, who championed the rise of electronic media and decried certain inherent attributes and associated behaviors of print:

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[105] Ibid. Pp. 88.

[106] Krutch, Joseph Wood. "A Humanist's Approach," The Phi Delta Kappan, Vol. 51, No. 7, (Mar., 1970). Pp. 278.

> We haven't really cottoned on to the fact that our children work furiously, processing data in an electrically structured information world; and when these children enter a c1assroom elementary school, they encounter a situation that is very bewildering to them. The youngster today stepping out of his nursery or TV environment, goes to school and enters a world where the information is scarce but is ordered and structured by fragmented, classified patterns, subjects, schedules. He is utterly bewildered because he comes out of this intricate and complex integral world of electric information and goes into this nineteenth-century world of classified information that still characterizes the educational establishment. The educational establishment is a nineteenth-century world of classified data much like any factory set up with its inventories and assembly lines. The young today are baffled because of this extraordinary gap between these two worlds.[107]

In-between these two ends of the spectrum lay an assortment of reactions by humanists who felt that multimedia instruction, in one way or another, could or should, be made in to fit into the print dominated realm of humanities education. For many humanists, doing so constituted a unique way to accomplish several goals central to their field—some long-established and others, part of curriculum reform in the humanities of the 1960s. First, there were those who believed new media to be particularly well suited for humanities instruction, because the content of that instruction was often narrative, experiential, affective, or aesthetic and

[107] McLuhan, Marshall. "Address at Vision 65," The American Scholar, XXXV (Spring 1966). Pp. 201.

sensory-oriented in nature. Thus, multimedia instruction could, and according to some should, be used to highlight those affective aspects of humanities material traditionally transmitted via text only. Often these educators experimented with a kind of "total experience" in humanities instruction, what I am calling an "immersive humanities," and hoped that such instruction could revitalize the humanities in a time of perceived decline.

Second, there were humanities educators who felt that the use of new media was an ideal way to speak directly to students' contemporary world, an educational responsibility which humanists had recently been charged with ignoring altogether. As the pressure of the 1960s mounted, more and more, humanities scholars and educators were called on to address "what it means to be human in today's world." As a result, the humanities enterprise came to incorporate new media in these years for the same reason that it came to incorporate new material (popular culture, contemporary issues and the culture and ideas of traditionally underrepresented groups)—namely, in an effort to become more publically engaged and more socially relevant. On one level, this simply meant using multimedia instruction in an effort to better relate to the unique experiences and proficiencies of the "television-" or "electronic-generation." Doing so was thought to appeal to students' receptivity towards new media, to tap into their advanced aural and visual sensibilities developed in world outside the classroom and as a result potentially rejuvenate humanities content by making it more gripping and up-to-date.

Other humanists had broader ambitions in using educational technologies to expand their social relevancy. Their use of electronic media was, I'll argue, part of a widespread, newly felt, sense of techno-social responsibility in the humanities in these years. With educational technologies specifically, humanists felt a responsibility to respond to the information explosion in a way that ran counter to the reactions of the social science, electronics and engineering

communities. First, these humanists argued that they had the unique responsibility to expand their notions of "media literacy" commensurate with the new "electronic environment" emerging in these years—to incorporate new media into the realm of communications for which they felt a responsibility to impart critical interpretive skills. Second, they found uses for educational technologies which fit squarely into the humanistic tradition—using them to invoke the full sensorium in getting students to critically engage and interrogate reality. Both efforts were essential if humanists, in an era of information overload and accelerated change, were to fulfill their traditional task of instilling in their students the capacity to order their experience of the world meaningfully. In all these ways the humanists I'm describing—what I call socio-technical humanists—were able to turn so much rhetoric from the electronics industry and behavioral sciences on its head and appropriate electronic media for their own purposes.

But what did humanists have in mind when employing these terms? What did "new media literacy" mean in the context of the decade? Since the 1960s the terms "electronic media" or "new media" have been used to single out specific technologies appropriate to the period in which they're used. Today "new media" largely denotes the internet. In the early-to-mid 1990s, a time when much cultural commentary was focused around the "death of the book" and the National Endowment for the Arts widely circulated report, Reading At Risk: A Survey of Literary Reading in America, decried the "decline of literary reading," "new media" largely signified the video game and the Walkman—those technologies proliferating private and distracted experiences. In the 1960s "electronic culture," "electronic environment," "electronic media" or "new media" had a complex of meanings. Materially, the terms denoted television and the computer, largely. But a host of other technologies came to mind for people using these terms: the widespread use of audio-tapes; the new availability of video tapes; classrooms wired

with sound, slide projectors, TVs and overhead transparencies; facsimiles and telewriters; any communication via satellite; and even lasers and light shows. Conceptually, the terms "electronic culture," “electronic environment,” "electronic media," or "new media" in the 1960s invoked a sense of the new speed, omnipresence and networked nature of audio and/or visual media and information as well as the new ability to organize, store and retrieve information via computers and information retrieval systems.

**I. The Crisis of Engagement in the Humanities**

> Today the humanities are still assumed to make man more human, but they locate the threat that they must counter not in the animal world but elsewhere, in the world of machines. The humanities are commonly set off against science and its mechanistic offshoot, technology. The inhuman other is no longer a population of brutes to which man s lower, nonintellectual nature threatened always to hold him in bondage, but a population of nonliving things that he has made.[108]

The humanities have always defined themselves in opposition to something. This is not to say that no one has ever held a positive definition of the humanities. Indeed, many--perhaps too many-- have always existed. Rather, that alongside, behind or beneath whatever positive definition exists, the humanities have also always been identified in their essence as contradistinctive to some other set of activities and interests. In the renaissance it was barbarism or the lack of civilization; after the scientific revolution, it was always science; and from the late

[108] Deadalus, 1969.

19th century forward it was also mass culture. After World War II, while science and mass culture remained items of contradistinction, another item began to dominate: the technical. The vast techno-scientific output of the late 1950s and 1960s appeared threatening to the humanities on several fronts. First, funding and interest in the humanities on the whole seemed to be at stake as the United States geared up for the space race, spending thousands of times more money each year on science and engineering research. Second, humanists feared a loss of national leadership as they became increasingly cut off from a progressively hermetic scientific and technical culture. As a result, in the early 1960s there began to appear a collection of books and articles proposing that the humanities were in the grip of its most formidable crisis ever. Humanists, to be sure, were nearly always in a state of anxiety regarding their status, especially since the turn of the century. In the mid-to-late 1950s, they were, as we've seen, embroiled in a crisis concerning the Two Cultures—a crisis which saw them trying to keep up with science and technology by helping to guide the nature of television and by taking to the airwaves themselves. But the 1960s was a period which marked the beginning of a fervent "crisis" literature emanating from the humanities, a literature which continues till this day. What's more, it was in these years that the "Two Cultures crisis" of the mid-to-late 1950s transformed into a "crisis of engagement" of the 1960s—a crisis concerning the widespread accusation that "in a society in turmoil," as the *Bulletin of the American Academy of Arts and Sciences* put it, "the humanities seem far removed from the concerns of their time."[109] The threat that science and technology posed for the relevancy of the humanities combined with the accusation that humanists were generally socially disengaged found scholars everywhere clamoring for humanistic council on science and

[109] "What is Wrong with the Humanities Today?," *Bulletin of the American Academy of Arts and Sciences.* Vol. 23, No. 1 (Oct., 1969), Pp. 3.

technology. And thus, humanists interested in updating the mission of the humanities, found in technology, and in my case educational technology, a direct means of becoming more socially engaged.

The crisis began with unparalleled increases in the amount of funding for the sciences due to post-WWII national defense and the Cold War space race, as well as downturns in humanities funding, Both signaled to many the declining importance of the humanities in a technology-gripped America. As a kind of quantitative marker many pointed to the funding within the National Science Foundation which had been established as early as 1950 in order to promote "the progress of science… advance the national health, prosperity, and welfare; and to secure the national defense."[110] It began in that year with $225,000 in monies, but immediately increased to a full 3.5 million the next year. In 1954 a cap on annual appropriations was lifted and by the early 1960s it was spending near a half a billion dollars annually.[111] By comparison the humanities were receiving somewhere near one percent of this figure.

In the estimation of Francis Keppel, United States Commissioner of Education in 1963, the asymmetries in funding signaled that the humanities were beginning to play an ambiguous role in American society. They were still recognized as the spring from which flowed a civilization's great art, philosophy and literature, Keppel assured. But, rather ironically, they were at the very same time "kept on short rations financially."[112] "There does not seem to be

[110] See online at: http://www.law.cornell.edu/uscode/uscode42/usc_sup_01_42_10_16.html

[111] Keeney, Barnaby C. "The Humanities in American Society," *Proceedings of the American Philosophical Society*. (112; 1. Feb., 1968). Pp 4.

[112] Keppel, Francis. "Strengthening Support for the Humanistic Disciplines and the Public Arts," *The Journal of Higher Education*. ( 35; 1 Jan., 1964).

enough money available to do a satisfactory job of transmitting our cultural heritage to the rising generations," Keppel went on, "an expression of concern for science and engineering, on the other hand, is on everyone's lips." The upshot according to these prognosticators was not just a waning of resources for the humanist but an increased call to future generations for "more engineers and more scientists."[113] These authors seized incoming numbers to show that, while the percentage of humanities majors fell off markedly, the student body of higher education had already swelled with future professionals, technicians and engineers. Relatedly, many feared a shift by those within the humanities and social sciences towards subjects and methods better suited to seize some of the research funds emerging from the new profusion of science and technology grants. "Federal dollars for the social studies have been directed to those that can claim to be scientific" one author for the *Journal of Higher Education* wrote, "Thus while in general historians can obtain no aid from the National Science Foundation, some federal monies have supported studies in the history of science; and while students of political philosophy receive no support, those who follow a quantifying approach can qualify."[114] Many of these authors argued that without more federal aid to the  education would become purely vocational—churning out more and more technicians—and the only concerns of future citizens would be ones of efficiency and order.

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[113] Cornog , William H. "Teaching Humanities in the Space Age," *The School Review* ( 72; 3 Autumn, 1964) The Arts in American Education.

[114] Snell, John L. "Advancing the Humanities: To Make Our Present More Secure and Our Future Worth Striving for," *The Journal of Higher Education*. (36; 1 Jan., 1965). See also: Schroeter, James. "An Enemy within," *College English*. (25; 8 May, 1964); Sacksteder, William. "Cyclotrons for the Humanities: What Humanists and Artists Need," *The Journal of Higher Education*. (39; 8 Nov., 1968).

The deplorable state of funding for the humanities in America and the resulting literature of panic on the subject roused the federal government into action in the mid-1960s. In 1963 the American Council of Learned Societies (ACLS), the Council of Graduate Schools in America, and the United Chapters of Phi Beta Kappa joined together to establish the National Commission on the Humanities whose expressed purpose was to consider the state of the humanities in America. A year later the commission released its full report, which converged on two main points: "that expansion and improvement of the activities in the humanities are in the national interest and consequently deserve support by the federal government ... [and] that federal funds for this purpose should be administered by a new independent agency to be known as the National Humanities Foundation."[115] In making the first point, the report drew on a number of ideas in wide currency among humanists at the time--namely, that the humanities were just as vital and influential as the sciences in regards to the survival and success of America in a cold war context. They argued, for instance, that the humanities enabled America to be a cultural leader on the world stage: a well-funded humanities demonstrated to other nations that Americans were more than mere materialists[116]; humanistic studies produced citizens (and potential diplomats) who understood the complexities of intercultural exchange.[117] But it was the second point of the report which quickly became an item for legislation. In August of that year,

[115] Report of the Commission on the Humanities. New York, NY: American Council of Learned Societies, 1964. Pp. V.

Congressman William Moorhead of Pennsylvania proposed legislation to implement the commission's full recommendations. But though the commission's report deliberated on the humanities only, members of congress observed the arts to be suffering an identical state of peril. Thus both the National Endowment for the Arts and the National Endowment for the Humanities were established under the same act: The National Foundation for the Arts and Humanities Act of 1965. The text of the act itself mimicked much of the language expressed on the floor of congress, during debates over its ratification, to the effect that the arts and humanities were not only similarly menaced by increasing technology but also served similar purposes in relation to it:

> An advanced civilization must not limit its efforts to science and technology alone … Democracy demands wisdom and vision in its citizens. It must therefore foster and support a form of education, and access to the arts and the humanities, designed to make people of all backgrounds and wherever located masters of their technology and not its unthinking servants.[118]

If the vastly disproportionate amount of funding for science and technology over the humanities appeared troubling—even hazardous—to academics and others, so too did the increasing lack of communication between the worlds of the humanist, scientist and technologist. More specifically, what commentators informing the "crisis in the humanities" in the 1960s railed against was the increasing lack of influence the humanities were perceived to have on a newly dominant and hermetic scientific and technical culture. An explicit dread was registered

[118] http://www.nea.gov/about/Legislation/Legislation.html

by many academics and educationalists alike that as society's craving for science and technology pulled far ahead of any interest in the humanities, the central questions and concerns of the humanist would cease, perilously, to inform the tendencies and objectives of modern society's greatest twin forces. The humanist was needed more than ever, many warned, to give science and technology the moral bearing it by definition could not provide for itself. A typical characterization of the humanities as offset from the sciences ran: "The values of humanistic pursuits lie in what they do to give the individual a deeper, broader, and richer understanding of himself and his relations to other men [as well as] his time and place."[119] Technology and the sciences, these authors scorned, were purely means directed; that is, they were merely concerned with the most efficient and effective process to achieve a given end. By contradistinction, the humanities inherently aimed to question and inform those aspects of life which were ends in themselves—"moral principles and life's ideals."[120] One author schematized the respective concerns of science, technology and the humanities this way: The first asked what there was to be known about the world, the second, what use could be made of this knowledge, and the last, what use *ought* to be made of this knowledge.[121] "The humanist, thanks to his understanding of history, sees the political, economic, and the social crisis of his generation in the perspective of the past," Paul A. Varg, Dean of the College of Letters and Science at Michigan State University wrote in the *Journal of Higher Education*, "Humanists are not problem-solvers."[122] The interests

[119] Varg, Paul A. "The Proposed Foundation for the Humanities: Recapturing the Spirit of Humanism," The Journal of Higher Education. (36; 5 May, 1965).

[120] Hoor, Marten. "Why the Humanities?: Their Contributions to the Spiritual and Intellectual Life," *The Journal of Higher Education*. (34; 8 Nov., 1963).

[121] Ibid.

[122] Varg, Paul A. Ibid.

of the humanist, Varg goes on, are first, as a citizen invested in a better world, and as a "scholar and artist" invested in how to create and cope with that world. Where the humanist assesses motivations, goals and value systems in the real world, the scientist constructs an artificial realm divorced from that world: "[The] scientific method limits and narrows the problem at hand so as to fit it into a design that permits controlled testing and quantification." The sciences, these authors warned, in what they hoped was a timely fashion, cannot be removed from the moral, political, historical and social investigations of the humanities.

## II. Techno-Social Responsibility in the Humanities

In 1967 and 1968 the American Academy of Arts and Sciences held a set of conferences on "The Future of the Humanities." Attended by forty-five distinguished humanists, the conferences were the answer to a set of concerns that unexpectedly dominated a two-day symposium, "Science and Culture" four years prior--namely, the relevancy of the humanities. "The prevailing mood" at the 1967 and 1968 conferences, James Ackerman summarized in Deadalus, "was one of self-criticism based on the conviction that ... the humanities were not living up to their potential as vehicles for the understanding of man's achievement and promise."[123] In conference papers and in structured group discussions, participants agonized over the current state of the humanities. Since the mid-1960s, widespread social disruption outside the academy, exemplified most by urban unrest, the Vietnam War, assassinations of major public figures and an extensive student rebellion, had forced its way into the classroom. As a result, the

[123] Ackerman, James. "Introduction to the Issue, 'The Future of the Humanities," *Daedalus* (The Future of the Humanities), Vol. 98, No. 3, (Summer, 1969). Pp. 606.

principal aims of the humanities--to introduce students to the central traditions of Western culture--had begun to appear to students and scholars alike as particularly constrained and out of touch with the present world. To many, there appeared as never before, a yawning chasm--a near total disconnect--between the traditional subject matter of the humanities and the rest of life. So too did there appear a disconnect between the traditional medium bearing that subject matter and the rest of life—between the worlds of print and electronic media.

Early on at the conference, Walter Ong, professor of English at St. Louis, outlined the charges against the humanities which together amounted to the overall indictment that the humanities failed to connect to the "rest of actuality."

> Too many teachers fail to convey any sense of the real world in which their own responses and students' responses to the material of their subject take form…The teacher not infrequently insulates his class and his subject from his own and his students' actual life, never daring to regard the realm of television and electronic guitars and newspaper headlines and politics and ghetto housing with the intent gaze he directs to the wit of Ben Jonson or Marvell or Rembrandt's light and shadow or Bach's fugal counterpointing.

Technology was, in fact, a central topic of concern at the 1967 and 1968 conferences, a critical element, participants averred, in assessing the future relevance of the humanities. Embracing computational and information technologies was not just important because it allowed humanists to find uniquely humanistic uses for them, participants argued, but it also allowed them to relate to 1960s youth. “Perhaps the real question before us is whether we can

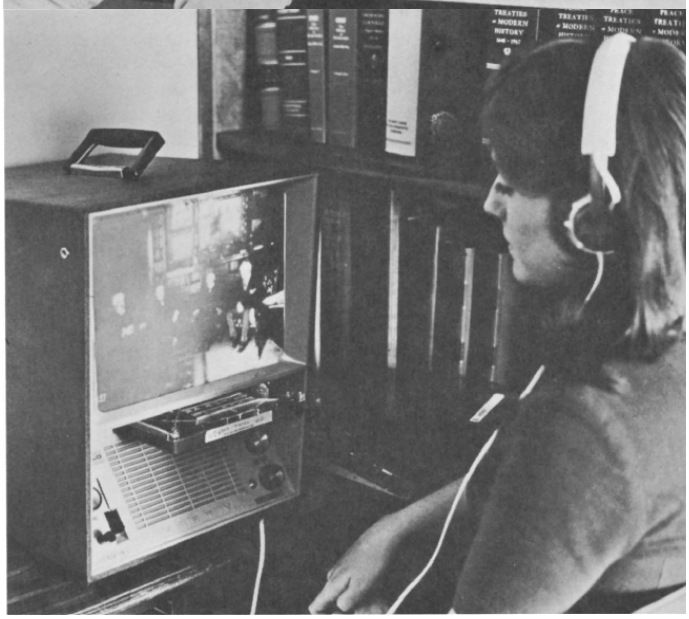
communicate with these students ["the technological youth"]," offered Robert Coles in a discussion period following papers, "I hope our discussion does not deteriorate into an anti-technological diatribe…as Stephen Graubard said, this is one option we do not have; furthermore, nothing would suck us so fast into irrelevance." In many respects, the incorporation of electronic media into the humanities enterprise in these years paralleled the analogous incorporation of contemporary issues, popular culture and non-western culture and ideas into the curriculum. Both updated humanists' connection to their students' world.

***Teaching the "Electronic Generation"***

The use of electronic media in particular proved a critical way for humanists to commit to their student's interests, real-world experiences and media sensibilities—to commit to their student's world outside the classroom, a world no longer dominated by print. Using media appeared to be profitable in many respects. Teaching the "electronic generation" via electronic media was a better way to reach them— it took advantage of students' eager receptivity to, for instance, the screen and to the immersive character of audio via headphones. As a result, using media also brought the narrative and experiential quality of humanities content to life, "rejuvenating" humanities instruction, in the process. And finally, using media in the classroom took advantage of student's developed visual sensibility and gave humanities educators the opportunity to help guide its critical uses.

"[Students] enjoy history class for a day," Edwin Fenton, professor of history at Carnegie-Mellon wrote about the use of transparencies, "They also learn that a picture … can be used to generate a hypothesis as a starting point for historical investigation, a useful piece of

knowledge for a society in which *Life* and *Look* outsell all the historical journals combined many times over."[124] The ultimate medium in these respects was film, and the late 1960s saw a great expansion in its uses for humanities content. In 1967, the American Historical Society's Committee on University and College Teaching initiated the Feature Film Project which commissioned twelve historians to edit historically-oriented theatrical films into half-hour segments for use in college classrooms. The very next year, Chelsea House publishers who had recently acquired a massive collection of newsreel footage, hired history professors from the City College of New York, directed by Arthur Schlesinger Jr., to produce narrated half-hour segments for their "History Machine" series. Both projects aimed to make history more sensually and emotionally compelling to be sure. "What historian would not sell their soul for



**Figures 3.1 and 3.2. Jackson, Martin. "Education: The Future Role of Films in History," The History Teacher, Vol. 3, No. 3 (Mar., 1970). Pp. 12, 19.**

[124] Fenton, Edwin. "Using Audio-visual Materials to Teach History," *The History Teacher,* Nov., 1968. Pp. 44.

footage of Julies Caesar addressing the Roman Senate," asked Martin A. Jackson, lecturer at Herbert H. Lehman College and one of the historians working on the AHA's Feature Film Project.[125] But both projects were also explicitly conceived of as a way to break down the "generation gap," to relate more concretely to their students' electronic sensibilities. "This is the electronic generation visually," Jackson asserted, "children are weaned on television sets, they deal with the world in visual terms and are often strangers in the land of the printed page."[126] In advocating the use of films in history instruction, Jackson employed an argument familiar among educators in the 1960s. He pointed to a generational distinction in order to illustrate the difference between classroom film use in the 1950s and 60s. After all, educational and instructional films had been around for years. The 1950s was full of children sitting in darkened rooms watching half-hour segments on plant growth and personal hygiene. What had changed was not just the overall media environment –more forms of interconnected media-- but the students themselves. Students of the 1950s were a "television generation," but they were not born into a world with television. Students of the 1960s were an "electronic generation," not just a generation growing up in a world of the computer, interconnected information and multimedia environments but they were born into a world dominated by the television screen. A great deal was made of this latter point. Students of the 1960s were, according to John Culkin, famed media scholar at Fordham University, "the only people who are the native citizens of the new electronic environment."[127] "Generations of students have been familiar with the audiovisual lesson,"

[125] Jackson, Martin. "The Future Role of Films in History," *The History Teacher*, Vol. 3, No. 3 (Mar., 1970). Pp. 10.

[126] Ibid. Pp. 11.

[127] Culkin qtd in Glueck, Grace. "Multimedia: Massaging Senses for the Message," *New York Times*. Sep 16, 1967. Pp. 35;37.

Jackson admitted. The difference was that "Students born in the 1950's bring to the classroom a highly developed visual sense." "What better way, then, to instruct the children of the television age?" he concluded.[128] In fact, both projects did what they could to make the presentation of their newly acquired films similar to the experience of television. They avoided the "foreboding appearance of ordinary movie equipment" and instead, took advantage of new cartridge-loaded, 8mm, rear-projection film technology developed in 1965 by Kodak (used by the feature Film Project) and Fairchild (used by Chelsea House) (Figures 3.1 and 3.2). These new rear-projectors looked and functioned like standard television sets. "They invite use by the student," Jackson concluded.

***A "Total Experience" in the Humanities***

Another way to engage students of the electronic generation was immerse them in their own media. In 1961, Robert Pooley, chair of the Department of Integrated Liberal Arts at the University of Wisconsin, imagined for the audience at the National Council of English Teachers, the potential benefits of advanced audio-visual methods for literary instruction. In a futuristic flight of fancy which drew out the latent implications of advancing classroom technology, Pooley showed contempt for selected impending aspects while endorsing others. His talk, a guided tour of a "model school system" in the year 1975, contained many of the obvious dystopian criticisms of automation run amok: nearly all teachers had been replaced by computers; all students were watched by a central control unit which levied out punishment by flashing a student's number on a classroom screen, alerting them to go to detention. But not all

[128] Ibid. Jackson, Martin. Pp. 11.

electronic systems in Pooley's prophecy were detrimental to the educational process, and in particular, English instruction. Pooley was especially intrigued by the prospect of immersive multimedia literary teaching. The centerpiece of his futuristic fantasy was an advanced audiovisual English classroom where students enjoyed a "profoundly moving experience" of Matthew Arnold's "Dover Beach."[129]

> Now the first screen dims and one at the center comes to life. Tom motions us to put on the earphones, which we find attached to the back of the seat in front of us. They are large and comfortable; immediately our ears are greeted by some soft background music which we re-cognize, after a moment, as one of the English suites by Ralph Vaughan- Williams. A moment later the music fades and an excellent, clear voice announces, "'Dover Beach' by Matthew Arnold"… As the poem begins we see on the screen a gentlemen dressed in the costume of an Englishman of the 1860's sitting at a writing table in a room with French doors partly open; through them we can see the water and the moon over it. In the room, sitting in a comfortable chair is the gentleman's wife. She looks up when he rises to glance out the window. When he speaks the words, "Come to the window, sweet is the night air," she joins him. And thus through the poem, in natural and homely movements, we observe the thought of the poem to take shape, as it were, in the mind of the speaker. Not only by his voice, not only by his words, but also

[129] Pooley, Robert C. "Automatons or English Teachers?" The English Journal, Vol. 50, No. 3. Pp. 169.

by his face, his gestures, his bodily movements, we sense the conflict in his mind, the mingling of doubt and faith, and the quiet despair of his feelings.[130]

Pooley's fantasy exhibits a number of features common among humanists in the 1960s who made a case for the use of multi-media instruction in their field. On the one hand, Pooley makes clear that literature is fundamentally experiential and therefore well suited to multimedia instruction. On the other hand, he indicates that such methods took advantage of students' developed sensibility for their electronic world outside the classroom to impart such uniquely experiential material. Pooley mentioned several times how "rapt" and "absorbed" his hypothetical students were with the experience. Pooley's potential classroom system had borrowed just enough of these students' electronic world outside school to captivate their born-electronic sensibilities. As electronic natives, text and action on a glowing screen coupled with music and dramatic readings all fading in and out at perfectly controlled key junctures—the overall electronic environment—was irresistible to them. "Nor is the spell abruptly broken," Pooley went on, "The screen slowly fades, and soft music for more than two minutes permits of meditation and emotional adjustment to the message of the poem. Then the music changes pace to a matter-of-fact, lively air, the screen lights again, and we see a distinguished professor of English literature from a Midwest university."[131] These students were used to being mentally and emotionally cued by the patterns and rhythms of media—the transition from opening credits to a main feature, the emotional changeover in a film score, the predictable disruption of commercials—so why not import that guiding mechanism into the classroom?

[130] Ibid. pp. 170.

[131] Ibid. Pp. 171.

By the mid-to late 1960s, humanities educators were in fact experimenting with these types of total-audio-visual systems—testing and then talking about the potentially profitable relationship between electronic and humanistic experiences in the classroom. In 1965, Richard A. Stowe, an English teacher in Skokie, Illinois described this system used for instruction in language and poetry:

> The students file into a large, light, attractive room and take seats at tiered rows of tables. Before each student is a set of four buttons, marked A, B, C, and D. Lively music begins to come from overhead speakers through-out the room. Projectors begin to whir quietly in a small darkened room behind a plastic screen at the front of the auditorium. As the auditorium lights dim, a brilliant image illuminates the screen. "Language" reads the title. The image then dissolves into the single word: "Listen!" The music fades out, and a baby's voice is heard calling "Da-da, da-da." A baby's picture appears on the screen at the same moment. Then the voices of children at play fill the room as their photograph replaces that of the baby. Next come the pictures of a married couple, a school class, a radio announcer, and a child reading from a book, all matched with the appropriate sounds of language.[132]

Mixing media; intermingling multiple senses alongside ideas; appealing to a complex of cognitive and affective registers created a "total experience," a phrase regularly employed by

[132] Stowe, Richard A. and Andrew J. Maggio. "Language and Poetry in Sight and Sound," *The English Journal*, Vol. 54, No. 5. Pp. 410.

humanities educators advocating educational media in these years. As Pooley and Stowe pointed out, such an experience could be incredibly effective in bringing out the combined cerebral and sensible nature of language and literature—itself a total experience. "Literature, and poetry in particular… affects the senses as well as the intellect" argued Martin Birnbaum, professor of English at Oregon College, "the initial experience is, in fact, sensual… it is a total experience."[133] Numerous English teachers and professors in these years attempted to translate literature into multisensory experiences. Many did so in an ad-hoc kind of way. The pages of *Media and Methods*, a new journal whose overall focus was the classroom use and analysis of new media, predominately in the humanities, were full of English educators trying to figure out the relationship between the experience of literature and new media in the classroom. Others directed experimental projects funded by the U.S. Office of Education. Birnbaum, with funding from the USOE, experimented with the multimedia rendering of poetry in the classroom. Birnbaum did not employ the kind of immersive, centrally-coordinated, audio-visual system like Stowe's or like the one in Pooley's educational fantasy. He, like most humanist using media in these years, employed a more modest process, utilizing transparencies, films, audio recording and slides at different points during class. But the argument was the same: an experience with literature that involved "as many senses as possible" would result in "greater understanding" and "greater enjoyment." There was a sense that appealing to multiple senses would both engage students on an affective level critical to the experience of literature and update that literary experience by transplanting elements of their increased audiovisual environment in the outside world into the classroom.

[133] Birnbaum, Martin J. *The Use of Media in the Teaching of Poetry. Final Report. CORD Project in the Teaching of Poetry 1967-1969*. Oregon College of Education, Monmouth, 1969.

Art history was another subject whose educators found themselves disposed to experimenting with multiple media systems. At Freedom High School, Bethlehem, Pennsylvania, for example, teachers constructed a single, centrally controlled console which employed four screens capable of displaying super 8 motion pictures, 16mm sound movies, filmstrips, color slides, and audio via records or tape recordings (Figure 3.3):

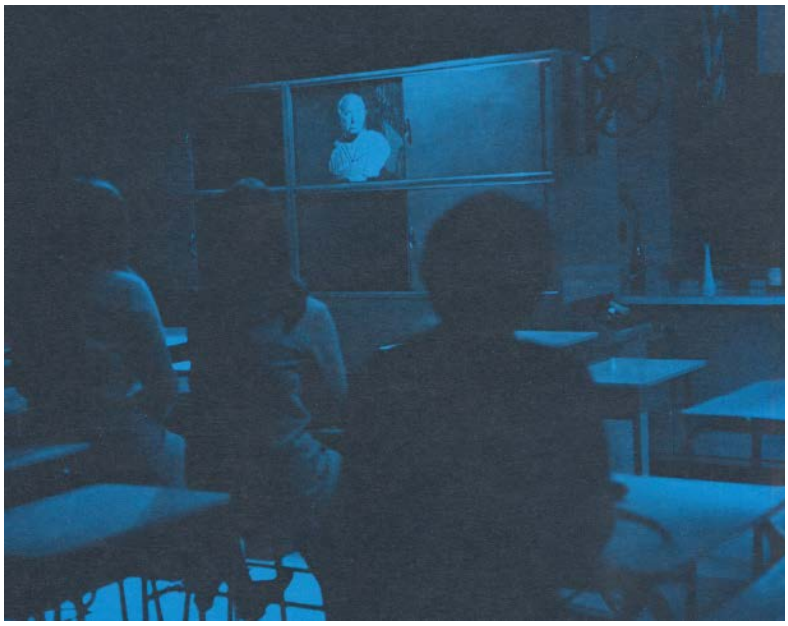


**Figure 3.3. Source: Gilmartin, Frederick G. "AV Media and the Art Room," Art Education, Vol. 23, No. 3. Pp. 30.**

> At the touch of a button, one of the "eyes" glows with vivid color as a 16mm motion picture shows an art history class the life of the ancient Greeks and their use of pottery. Still another touch, and a second "eye" flashes on to demonstrate, through a 35mm filmstrip, how pottery is made. This is followed by 35mm slides of Greek amphoras from various collections, to illustrate the evolution of the shape and how it was refined to attain maximum beauty and utility. Finally, a super 8 movie of a ceramics class in the Bethlehem Area School District

fashioning its own pottery, and more slides of contemporary pieces, unite the entire presentation.[134]

Teachers experimented with combining various media to affect specific moods: native-American music while showing slides of George Catlin's work on the west; sounds of industrial machinery during a presentation on modern steel sculpture. Experimental multimedia systems in art history and art education abounded in these years. At Foothill College in Los Altos Hills, California, art educators created slide presentations synchronized with music, sound effects and lecture material for individual study. Their aim, as with English educators, was to move "beyond the cognitive domain into the affective area." Perhaps the most sophisticated was at Troy State College in Alabama, where Robert C. Paxson established an "Automated Esthetics Laboratory" with several facilities, including a central audio-visual classroom and a self-instructional center with testing devices.

***The Information Explosion***

For humanists, the knowledge explosion signified a unique kind of challenge; it amounted to modernity's latest obstruction to man's coherent and meaningful experience of the world, the latest and perhaps most powerful force for fragmentation. For members of the electronics industry, behavioral scientists, academic administrators and educational technology engineers, educational media became one way out of the information crisis. As is often the case in the history of technology, here again, the potentially injurious social effects wrought by a new

[134] Gilmartin, Frederick G. "AV Media and the Art Room," Art Education, Vol. 23, No. 3. Pp. 29.

set of technologies were thought to be mitigated or even fully alleviated by the existence of other technical systems. The postwar boom in scientific and technological research which made the electronic revolution possible--that is, the development of means for the electronic transmission, storage, organization, retrieval and processing of information—was also responsible for generating the tremendous upsurge of information which now had to be transmitted to and organized for humankind. For those advocating a technical solution, the way out was to develop and implement more effective and efficient forms of largely non-print communication systems. For humanists who embraced educational media, the new technology did not constitute a way to simply transmit information faster. From their end of things, doing so only made matters worse. Instead, humanists found their own uses for new media, uses which fit squarely into the humanistic tradition and which were commensurate with their own concerns about the information explosion. In new media humanists found the means to expand their traditional ideas of literacy and to impart to their students a critical mastery of their new electronic environment. They too found the means to invoke the full sensorium in getting their students to critically engage and interrogate reality. Both efforts were essential if humanists, in an era of information overload and accelerated change, were to fulfill their traditional task of instilling in their students the capacity to order their experience of the world meaningfully. In these ways humanists were able to turn so much rhetoric from the electronics industry and behavioral sciences on its head and appropriate electronic media for their own purposes.

At the most fundamental level, humanists' engagement with new media in the 1960s was a response to a new electronic environment in which the nature of information, communication and experience themselves were changing. If humanists reacting to television in the 1950s were interested in fitting the new medium into a world of print, humanists concerned with electronic media in the 1960s were reacting to the possibility that new, more effective and efficient forms of non-printed communication could soon or eventually take their place at the apex of education and culture. Many were convinced that the "electronic revolution" would significantly impact if

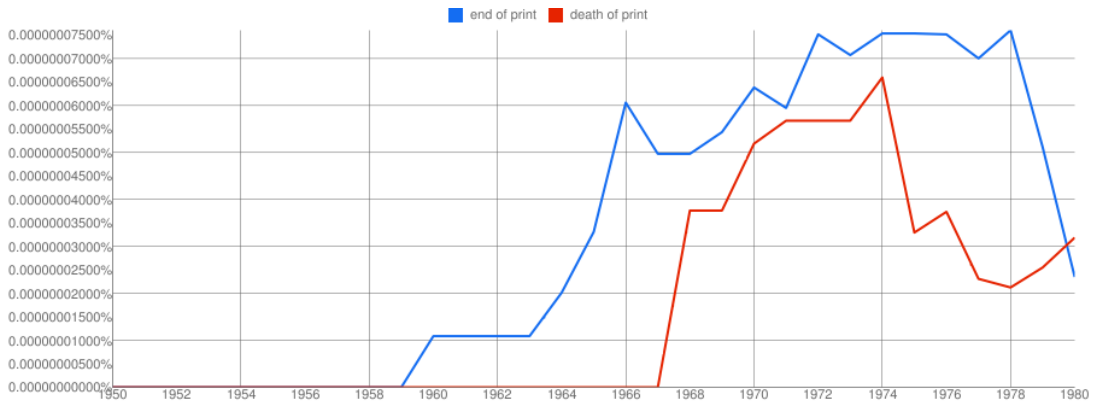



**Figure 3.4. Google Ngram Viewer for "end of print" and "death of print" between 1950 and1980, English Corpus (1.5 million books), smoothing = 3.**

not supersede print technology. And that feeling had escalated over a few short years (see Figure 1). While educators in the 1950s, humanists and others alike, constantly referred to television as "the most important invention since print," or …since Gutenberg," in the mid-to late 1960s, they regularly spoke of leaving the Gutenberg era behind altogether. In the 1950s, humanists endeavored to bring television programming up to the quality of print. In the 1960s, they were more apt to question the very status of print, for good or for ill. Take for instance, Edmund Farrell's 1967 report to the National Council of Teachers of English, English, Education and the Electronic Revolution. The report is striking in its differences from the NCTE's earlier

publication on the field's relationship to new media, Neil Postman's 1961 Television and the Teaching of English (which we saw in chapter two). Farrell, professor of English Education at the University of California, Berkeley, like Postman, also averred a strong commitment to television education within his field: "A teacher of English who accepts responsibility for helping students develop taste appropriate to the age in which they will live should spend considerable time in the classroom discussing television programs."[135] But Farrell, espousing a sentiment in much wider circulation by the mid-1960s, also repeatedly questioned the fate of print altogether. "This is not to argue that teachers of English should purge their classrooms of books," he maintained while still speaking about television, "Though electronic devices may eventually eliminate most books as physical objects."[136] Toward the beginning of his report, Farrell even chastised contemporary Education and English teaching for failing to prepare students for the outside world and offered this forecast: "What future place books will have, either in education or leisure time activities, cannot confidently be predicted. Certainly they will not dominate education as they presently do."[137]

Thus in one sense, humanists' analytical and hands-on engagement with new media in the 1960s was a way to take up the reigns of the new technology at a time when it looked as though information, knowledge, culture and education might be making a sizable migration to new media formats. After all, humanists were there in the 15th century when culture made an analogous migration from the scarce written page to mechanically repeatable text and they wanted to be involved in its potential migration from text to the screen. The historical analogy

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[135] [135] Farrell, Edmund. *English Education and the Electronic Revolution*. Campaign, Illinois: National Council of Teachers of English, 1967. Pp. 53.

[136] Ibid.

[137] Ibid. Pp. 8.

was not lost on humanities educators. Scholars familiar with the history of communication seemed to make the connection most clearly. In 1968 Walter Ong, Renaissance scholar and media theorists, asserted what many then and even now are reluctant to admit: "Opposition between technology and the humanities is more imaginary than real."[138] "The humanities," he went on to argue, "seize on technological interventions for their own specific purposes." Offering evidence from his own period of study, Ong compared humanists' use of electronic media and computers in the 1960s to their analogous techno-cultural intervention in the late 15th century: "The printing press, a technological device, was developed largely under Renaissance humanist auspices." Not only were humanists intervening in the transition from print to electronic culture just as they had in the shift from writing to print, but, according to Livio Stecchini, professor of ancient history, the contemporary intervention was as essential as its earlier counterpart. "It will take a heroic effort by those who have competence in the field of thought to prevent the gadgeteers and the spiritually illiterate from obtaining the monopoly of the new devices," he avowed.[139] Discussing the need to counter the efforts and interests of behavioral psychologists and the producers of electronic hardware, he went on: "Here too an historical parallel is possible. In the first period of printing, a number of great humanists, among the most famous were Reuchlin, Beatus Rhenanus, and Lefèvre d'Étaples, became printers or employees of printers; in the sixteenth century several first rate scholars and thinkers chose the career of printer, often at great personal sacrifice."

[138] Ong, Walter. "Introduction: Knowledge in Time." *Knowledge and the Future of Man: An International Symposium*. Ed. Walter Ong. New York: Holt, Rinehart and Winston, 1968. Pp. 13.

[139] Stecchini, Livio. "Prospects in Retrospect: On Educational Technology." *Programs, Teachers and Machines*. Eds. Alfred de Grazia and David A. Sohn. New York: Bantam Books, 1962. Pp. 27.

Many averred just such a purpose to finding humanistic uses for educational technologies in the 1960s, uses which went beyond those on offer by this era's "gadgeteers." In other words, finding uses for educational media specific to humanities instruction amounted to more than cautiously incorporating the principles of humanistic education into the machinery of new media. Doing so also struck a number of observers as a needed corrective, a strategic inversion really, of educational technology's more standard justifications. "The community of educational psychologists, the Skinnerian behaviorists, who prepare linear and branching programs, who intimidate with formulas and occult numerical rituals, who scorn unmeasurable affect, to whom the word 'humanism' is anathema" Arthur Daigon, Associate Professor of English Education at the University of Connecticut summarized the dilemma, "their influence is becoming more and more evident in the prepared materials teachers are asked to use."[140] But, Daigon argued, a humanistic experience of classroom materials was possible within these new systems, despite the fact that they were devised and promoted by those who "scorn unmeasurable effect." Diagon likened the situation to a kind of intellectual subterfuge:

> The behaviorist has his sequenced branching or linear programs giving stimulus, response, and reinforcement; the technologist has his computers retrieving information and giving immediate but selective feedback; … and the educator-humanist, gloating quietly in the background, has his concern for involvement

[140] Daigon, Arthur. "Pictures, Punchcards, and Poetry," The English Journal, Vol. 58, No. 7 (Oct., 1969). Pp. 1033-34.

with poetry, for literature as affective experience supported and carried out by his erstwhile enemies.[141]

Other humanists envisioned a more amicable relationship with the producers of educational hardware, talking instead of working with them to insert humanistic uses of educational technology into the mainstream. Participants at the Academy of Arts and Sciences 1967 conference on the Future of the Humanities quarreled over such a possibility, as Charles Muscatine, professor of English at Berkeley, related:

> We turned again to the question of our curriculum and spent a good deal of time talking about the curriculum in relationship to modern circuitry. Our opinions differed significantly on this subject… Eric Martin, Bill Arrowsmith, and myself [thought] that we ought to get aboard these machines and see how well they can be made to work. The technologists producing them are still in a mood to take direction as to how they can be used.

The trick, as everyone observed was in finding uses that were truly within the humanistic tradition: "The option will not last forever," Muscatine continued, "and… if we do not tell them, they are going to fumble to non-solutions of their own from which we will suffer in the long run." The question was one visited by humanists everywhere in these years. Participants at a 1965 conference, Automation, Education and Human Values aimed at understanding "the humanistic implications for education of … technological

[141] Ibid. Pp. 1037.

change," for instance, constantly turned to this theme, often underscoring the difference between genuine humanistic uses for educational technology and what some considered non-humanistic uses of modern electronics in humanities computing.[142] While speaking about educational technology and the unique demands of humanities instruction, Maxwell Goldberg, professor of humanities and Associate Director for Humanities at the Center for Continuing Liberal Education at Pennsylvania State University, offered this warning:

> The computer, as well as other instrumentalities of programmed learning, may be expected, sooner or later, to invade the last sanctuary of humanistic and liberal education. It may be expected to insinuate itself into the domain of the dialogue—'The Great Conversation…It already has penetrated into the cubicles of humanistic scholarship and research.

***"Media Literacy" in the Humanities***

Alongside the feeling that educational technology proved a vital way for humanists to connect to their students was the sense that they had the distinct responsibility to prepare those students to critically engage their native world of newer media, just as they had with television in the 1950s. Thus the impulse among humanists in the 1950s to help their students develop levels of taste and discrimination in their engagement with newer media continued into the 1960s with the focus of that impulse expanding from television to all things electronic. Some did still focus on television, but of course the meaning of the device had changed from a decade prior. Within

[142] Automation, Education and Human Values

the new electronic environment the meaning of individual media changed—film, television, even magazines were, from one perspective, now part of a communications world which also included time-sharing computers, microwave-linked nation-wide teleconferencing and picture-phones. Television, for instance, was no longer just a screen in a classroom or a living room. Televisions were broadcasting transmissions via satellite; via city and state wide closed-circuit networks; via cross-nation microwave teleconferencing links. In some ways, television was now part of an instantaneous, potentially global, nearly-cybernetic information network in which ideas and experiences circulated faster and faster. "As satellite networks develop … man will no longer need to travel physically to change his environment," Farrell argued in summing up his section on television, "his stimuli will change by the world's coming to him." "What implications for the teaching of English [pocket-size televisions developed by Motorola] shall have no one can augur."[143] It was no longer just about getting students to watch good TV, or even to think of television as akin to the printed page. It was about the role of television in an overall instantaneous electronic communications environment. Thus, even when humanities educators focused on television in the late 1960s, often there was now an expectation that developing students' critical apparatus for TV would help them navigate their total communications environment. "It has long been a recognized obligation within the school to help children become literate in print. Now, it is just as important to help them become literate about other media. Literacy is a print concept; a similar process exists for the visual media too," argued Ned Hoopes, associate professor of English at Pace College in New York City, "As students become

[143] Farrell, Edmund. *English Education and the Electronic Revolution*. Campaign, Illinois: National Council of Teachers of English, 1967. Pp. 57.

more observant and articulate, they not only will demand more of the TV medium and of themselves, but will react more intelligently to other media."[144]

Thus in the 1960s, getting students to engage new media critically was about more than just imparting taste and discrimination for modes of communication beyond the codex. It was about getting students to critically engage the world—to interrogate reality—in a new way. The knowledge explosion signified a different kind of challenge for humanists than it did for other groups. For members of the electronics industry, behavioral scientists, academic administrators and educational technology engineers, speeding up the tempo of information transmission via educational media became a way out of the information crisis. But for humanists, the knowledge explosion amounted to modernity's latest obstruction to man's coherent and meaningful experience of the world, the latest and perhaps most powerful force for fragmentation. As a result, both within and without the humanities, teachers and scholars of the interpretive sciences were thought to have inherited a distinct set of responsibilities in the new electronic era. The accelerated rate of new information along with its increasingly automated organization, storage, retrieval and transmission prompted many, even those in industry, to highlight that traditional task of humanities teaching which seeks to instill in students and society the impulse to handle information critically, to turn data into meaningful knowledge. [145]

This new charge among humanists can perhaps best be seen in the transformation of Neil Postman's thinking throughout the decade. As we saw in chapter two, Neil Postman, associate professor of English Education at New York University, opened his 1961 *Television and the*

[144] Hoopes, Ned E. "Critics out of Vidiots," *The Teachers Guide to Media and Methods*. Vol. 4. Num. 2. Oct 1967.

Philadelphia: Media and Methods Institute, Inc.

[145] See for instance, *Education, Automation and Human Values*. (1966)

*Teaching of English* by encapsulating widespread sentiment among literary scholars in the late 1950s: “For millions of youngsters ... television is the most persistent and magnetic source of information and a primary source of literary experience. To the extent that their responses to television are informed, discriminating, and creative, we may be assured that our language and literature, as well as the lives of our students, will be enriched by contact with television.”[146] By 1969, in *Teaching as a Subversive Activity*, Postman had all but given up on the idea that television could be the source of quality literary experience. He was no longer concerned principally with television or with bringing the quality of its content up to the standards of print so much as he was concerned with all "electronic media" and the increasing irrelevance of the codex altogether: “What you have is a totally new environment requiring a whole new repertoire of survival strategies ... When you plug something into a wall, someone gets plugged into you. Which means you need a new pattern of defense, perception, understanding, evaluation. You need a new kind of education.”[147] Postman had something in mind. He first spelled out his new vision for education in a 1970 article, “Curriculum Change and Technology,” a support paper for the report "To Improve Learning; a Report to the President and the Congress of the united states by the Commission on Instructional Technology." The curriculum described would eventually be incorporated into the Media Ecology Program established by Postman at New York University a year later.

In the report, Postman encapsulated for his Washington audience the wide circulating sentiment as he saw it. Man’s meaningful experience of the world was dangerously confounded by both the knowledge explosion and by rapid change generally, the latter increasingly referred

[146] Postman, Neil. Television and the Teaching of English. New York: Appleton-Century-Crofts, 1961. Pp. v.

[147] Postman, Neil. Teaching as a Subversive Activity. New York: Delacorte Press, 1969. Pp. 7.

to as “future shock.” Humanists, in such an era had to ramp up their traditional endeavor to aid the individual in organizing their experience of the world meaningfully. But Postman was part of a cadre of humanities educators who felt that imparting critical media skills, both by teaching media and by using it in the classroom, was a primary way to produce students psychically capable of navigating a world of excessive information and accelerated change. “Imagine a clock face with 60 minutes on it,” Postman wrote, explaining the connection between the amount of information and the rate of change in society:

> Let the clock stand for the time men have had access to writing systems. The clock would thus represent something like 3,000 years, and each minute on the clock, fifty years. On this scale, there was no significant communication or technological changes until about nine minutes ego. At that time, the printing press came into use in Western culture. About three minutes ago, the telegraph, photograph, and locomotive arrived. Two minutes ago: the telephone, rotary press, motion pictures, automobile, airplane, and radio. One minute ago, the talking picture. Television has appeared in the last ten seconds, the computer in the last five, and communication satellites in the last second. The laser beam appeared only a fraction of a second ago.[148]

Thus, the human situation was fundamentally different from all prior periods of change: “CHANGE CHANGED,” he quipped. In such a situation, the mere transmission of information,

[148] Postman, Neil. "Curriculum Change and Technology." *Academy for Educational Development, Inc.*, Washington, D.C. 1970. Pg. 2-3.

that time-honored goal of much education, according to Postman, was not only irrelevant, it was damaging. What mattered now was not taking in more information, but a mastery of the mediums along which that information traveled. It was one thing when the codex was the only, or even the primary, mode of information transmission. In the Gutenberg era, reading skills were, by definition, a mastery of informational media. And since only one medium (the codex) mattered in that earlier era, imparting critical skills *about* mediums as objects of investigation didn't really matter either. But in the electronic era, in an environment where more and more informational mediums thrived, mastering the very concept of media was crucial "The way to be liberated from the constraining effects of any medium is to develop a perceptive on it—how it works and what it does. Being illiterate in the process of any medium (language) leaves one at the mercy of those who control it."[149] Thus, Postman advocated putting "multi-media literacy," by which he meant both the ability to use and the ability to critique the social effects of various media, at the center of secondary and post-secondary education.

Though Postman's position in the late 1960s was a drastic reconsideration of his earlier thinking about media, he was not alone in advocating that the mastery of media take center stage in humanities education. This argument, for instance, appeared in numerous articles in a new journal, *Media and Methods.* Frank McLaughlin, professor of English at Rutgers University and editor of the journal, put it perhaps more succinctly. Students had to work harder than any other in history to make sense of their environment, he averred. Educational reform which advocated the faster transmission and assimilation of information only added to the din of communications chaos: "The generation growing up in this information-polluted environment should at least be entitled to ear plugs and a map. This never quiet marketplace wasn't created by the youngster,

[149] Postman, Neil. Teaching as a Subversive Activity. New York: Delacorte Press, 1969. Pp. 166.

unfortunately, and helping him sanely inhabit it is the task of the educator."[150] The English educator, in particular, McLaughlin averred, could help by teaching texts not as revered cultural objects, but as examples in a wider curriculum which sought to explicate the social effects of media—"Not by annual pilgrimages to the shrines of Chaucer, Milton, and Shakespeare, but through interdisciplinary exploration of environments and media."[151] Perhaps most important, by doing so, McLaughlin argued, "the Humanities would be the heart of school programs, not the apologetic, makeshift intruder now struggling against the linear, utilitarian, and scientific influences that predominate."

In these ways, "media-" and "multimedia-literacy" ran afoul of established textual practices in the humanities classroom—namely, close reading. Once again, humanists were faced with a decision. On the one hand, they could remain bound to traditional practices, in this case, teaching the close reading of print-based texts, which many averred, fell further and further outside the "zone of proximal development" for the born-electronic generation. On the other hand, they could admit that large-scale social forces were changing the way people engaged culture and information, get on board, and remain vital by helping to instill critical interpretative skills for these new modes of media engagement. The decision was one humanists were constantly coming to face mid-century: how to help guide the new cultural and informational practices of the electronic age and at the same time remain true to the traditional and, many would argue, perennially important aim of humanities instruction—to teach the slow, contemplative and reflective engagement of cultural objects. Thus, multimedia literacy was, in

[150] McLaughlin, Frank. "New Circuits *or* Short Circuits?," Media and Methods, v4 n3, Nov 1967. Pp. 19.

[151] Ibid.

part, an attempt to negotiate between the practices of close reading and the demands of the new electronic world, between the established mode of textual engagement in humanities education and a world of sensory and information overload. And in this way, the information explosion, and humanists' felt responsibility to respond to it and its attendant technologies in uniquely humanistic ways, helped move them away from the instructional praxis of close reading in the 1960s.

In the late 1960s and early 70s, there was, for instance, a sizable vogue among humanities educators for putting media into the hands of their students. Many English educators fashioned assignments which asked students to use various media to interpret traditional literature. In some cases, the assignment was to translate a novel or poem into a single new media format, like film. In other cases, students constructed more inclusive multimedia presentations. "It is essential for students to become active, intelligent and discriminating consumers of both print and nonprint media" argued James Bell, an English teacher who in 1968 started requiring his students to construct multi-media presentations of novels in lieu of standard book reports.[152] In fact, according to Bell, television and newer media had become such an integral part of a student's communication environment that their overall creativity hinged on its mastery: doing so "could become the very beginning step toward an education of his whole imaginative life." Bell dubbed his method the Multi-Media Response Process, and in it, he specifically prohibited students from using any print material in their responses to texts. Bell, hoped, it seemed, that this process would force students to think about non-printed, new media as a semi-direct, translatable analog able to stand on its own terms with a literary text. Other educators required students to create

[152] Bell, James. "A Nonprint Response To Print," Paper presented at the Annual Meeting of the National Council of Teachers of English (62nd, Minneapolis, November 23-25, 1972).

projects that integrated literary texts with new media. For instance, English students at Belmont High school in Belmont Massachusetts, took poems and integrated them into slideshows which synchronized various media elements including the text of the poem itself, music, sound effects audio interviews and original photography.[153]

English educators were not the only ones who asked their students to translate the core texts of their field into multi-sensory media experiences. In 1971 the history department at the University of Delaware began offering a new course, History Through Media, with such a requirement. The course was part the department's new Media Center established in 1969. In that year, the American Historical Association in concert with Indiana University's History Department and Social Studies Development Center established the History Education Project (HEP). The project oversaw thirteen programs nationwide each of which sought "the improvement of history education and the training of teachers of history, grades kindergarten through PH.D.," though the primary emphasis throughout 1970-72 was on pre-collegiate teaching. Many of these programs incorporated multimedia elements into their curriculum reform and at the University of Delaware, in particular, the HEP team, comprised of two members of the history department, William E. Pulliam and Joedd Price, established the Media Center which produced and coordinated a collection of photographic slides, specifically for use in history department lectures.[154] As professors in the department began using more slides and

[153] Morrissey, Muriel E. "To Illustrate a Mood, Creatively," Leaflet; v68 n1 Feb 1969.

[154] Classifying and cataloging collections of audio-visual materials became a daunting task for many schools, colleges and universities. As humanities departments at Delaware and other educational institutions put systems in place to organize their collections, Robert Diamond, director of Instructional Resources at the State University New York, College of Fredonia, worked with professors in art history, English and history to formulate and build a nationally scalable search and retrieval system for slides in arts and humanities instruction. See, Diamond, Robert M. *The Development of a Retrieval System for 35mm Slides Utilized in Arts and Humanities Instruction: Final Report*. State Univeristy of New York, Fredonia, 1969.

film, James C. Curtis constructed his own course whereby students were required to do archival work and then present their findings in a multimedia presentation. "Some educators … claim that such projects are mere indulgences, pandering to the youthful exuberance for sound and light," Clark defended his course in The History Teacher, "Yet such exuberance exists. Today's student is television's offspring. His fascination with media, if properly channeled, can produce solid results that are educationally sound."[155] What's more, Clark argued, doing so required more than getting instructors to use media to convey the traditional information once confined to lecture notes or textbooks. It required moving students out of the passive role vis-à-vis media and giving them the opportunity to "master the medium" itself.

***The Aesthetic Education Movement***

Perhaps the most united and widespread effort among humanities educators in the 1960s to use new media to advance traditional humanistic goals can be found in the aesthetic education movement. Humanities educators like Postman, McLaughlin and others, attended to student's increasing need to make sense of their environment by focusing on critical media skills. Others focused on the sensory chaos of the era. Although aesthetic education meant different things to different groups, at its core was a belief that an "education of the senses" was now essential in getting students to make sense of the world around them. Sensory order, according to these teachers and scholars, was now a critical skill necessary for a meaningful experience of the world and educational media became an essential part of imparting that skill.

[155] Curtis, James C. and Stanley Schwartz. "Learning History through the Use of Media: An Experimental Approach," *The History Teacher*, Vol. 6, No. 4 (Aug., 1973). Pp. 536.

The movement is sometimes identified as originating with the inauguration of the *Journal of Aesthetic Education* in 1966 as well as special issues in *Studies in Art Education* and *Art Education* devoted to "aesthetic education" in 1966 and 1967, respectively. But of course, such publications more often mark a point of general acknowledgement for a set of ideas, or in this case, curriculum reform, and not a point of origin. In fact, the impetus towards aesthetic education began a few years before these publications. In 1962 the U.S. Office of Education established the Arts and Humanities Program whose task was to implement a nationwide program of educational research and development at the intersection of these two fields. Between October of 1964 and November of 1966, the Arts and Humanities program sponsored seventeen conferences, seminars, and workshops on art education alone.

What emerged out of these conferences, and in particular the Seminar in Art Education for Research and Curriculum Development held at The Pennsylvania State University and the Whitney Museum of American Art Conference, was a concrete plan among participants to carry out curriculum reform projects for arts and humanities programs in schools across the country. Thus, the movement was really comprised of a loose-knit community of scholars and educators who instituted various projects in "aesthetic education" or sometimes, "allied arts," "integrated arts," "interdisciplinary arts," or "arts in general education" in the 1960s and 70s. Among the largest these projects was the Aesthetic Education Program conducted jointly by the University of Ohio and the Central Midwestern Regional Educational Lab, the Allied Arts Project at the State Teachers College, Kirksville, Missouri and the Aesthetic Education Project at the University of Illinois, directed by Harry Broudy. Others outside the community of scholars participating in the Arts and Humanities conferences established similar large-scale projects, including the Rockefeller funded Arts in General Education Program and the Culture,

Understanding and Enrichment Program (CUE) established by the University of the State of New York, State Education Department.

Intellectually, the aesthetic education movement can be characterized as a widespread concern that emerged among scholars and educators in the early-to-mid-1960s with the role of arts education in the nation's schools, colleges and universities, and more generally, with the function of aesthetic experience and perceptual sensitivity in society at large. It was, in the broadest sense, a response to the increased focus on and funding for science and engineering related fields in the schools, colleges and universities of post-Sputnik America. Like the establishment of the National Endowment for the Arts and Humanities in 1965, the movement was born out of a widespread sentiment that the emphasis on numeracy, systematic reasoning and professional expertise had to be balanced with the development of feeling, values and affective dimensions of living in education. "The need for aesthetic awareness is greater in our own time than ever before," wrote Sam Reese, from the distance of the late 1970s, "Modern, technological society has created conditions which cause the sources for meaning and value in personal life to be meager and insufficient. The common conviction of the aesthetic education advocates is that the development of aesthetic sensitivity and the enrichment of subjective life that results will help fill some of the void created by the technomeritocracy."[156] As we've seen, in the 1960s, many both within and without the arts and humanities saw these two fields as bound together in an exclusive challenge: to maintain and demonstrate their merit by evidencing the unique importance of culture and values in a nation gripped by science and technology. One strategy among educators in the 1960s was to try to bolster the connections between the arts and

[156] Reese, Sam. An Implementation of the Cemrel Aesthetic education Program by Elementary Classroom Teachers: A Qualitative Observation. PhD dissertation, University of Illinois at Urbana-Champaign. 1981. Pp. 2.

humanities in school and college curricula. The aesthetic education movement was one such effort. "It is important to recognize the intimate relationships among the arts and humanities," argued Manuel Barkan, the first director of the Aesthetic Education Program at the University of Ohio, "Both are concerned with the meaning and quality of experience in life."[157] Aesthetic education programs were, after all, concerned with art appreciation and art history and not art practice. Most programs made a point, especially when applying for funding, of articulating a vision for aesthetic education whose purpose was not to develop art skills, or even to establish a model for taste and judgment, but rather to educate the aesthetic and affective sensibilities for effective and meaningful living. Thus, aesthetic education programs targeted humanities courses just as much as it did art courses. Humanities courses, in particular, Richard Kuhns, Professor of philosophy at Columbia University wrote in the second issue of *The Journal of Aesthetic Education*, provided the best opportunity for creating in students "the awareness of the unity which exists among philosophy, history and the arts."[158]

The aesthetic education movement of the 1960s wasn't the first time that an "education of the senses" was offered up as a cure for the human psyche in an era of rapid technological change. Social disruption is often sublimated into concerns over sensory chaos. In the late 19th century, the sensorial mayhem of urban living, the increased speed of industrial work and the widespread use of new technologies of representation like photography, film, the telegraph and telephone led countless observers to bemoan the overstimulation of the senses. Such conditions were thought to be responsible for perceptual fatigue leading to increased complaints of eye and

[157] Barkan, Manuel. Aesthetic Education Progam at the Ohio State University: Report on the Planning Phase. Unpublished Central Midwestern Regional Educational Laboratory, August 1967. Pp. 5.

[158] Kuhns, Richard. "Humanities as a Subject," Journal of Aesthetic Education, Vol. 1, No. 2 (Autumn, 1966). Pp. 7.

ear strains and of general bodily over-sensitivity and pain. It was also thought to be at the center of various new nervous disorders, like neurasthenia.

Similar concerns emerged in the 1960s. Although part of the problem in the transistorized world of the sixties, at least according to humanities educators, was that "sensory overload" had itself become a cultural vogue for youth. "A new method of communication is developing in our society—the technique of multimedia," wrote Grace Glueck in the *New York Times* in 1967, "Its jarring combinations of stimuli—sounds, lights, colors, smells and moving images—aim at reaching audiences by a supersaturated attack on all the senses."[159] The trend found its most extreme form in youth and counter culture. In the mid to late 1960s an number of discotheques in New York and Los Angeles opened up offering a "total environment" of music, pulsating lights, flashing slide images, projected films and at New York's Electric Circus, a color mist. But the notion of conveying messages by bombarding the senses with multiple audio and visual signals, of communicating via a "total experience," had wider traction. In 1964, John Brockman, a graduate of Columbia's School of Business Administration, started Brockman Associates, a firm which organized artists and filmmakers to create multimedia presentations for industry. At least one client, the Scott Paper Company, indulged Brockman's services, in which regional salesmen in nine cities received "the company's message by simultaneous projections, rock 'n' roll music and strobe lights."[160] Said a representative for the company, "We couldn't seem to get through to our salesmen. They're young—in their 20's—and they want to be with it. Since this is the kind of thing going on now, we decided to [do it]." Another firm specializing in "total kinetic environments," Sensefex, created similar presentations for Yardley of London, Inc., and E. I.

[159] Gluek, Grace. "Multimedia: Massaging Senses for the Message," New York Times, Sep 16, 1967. Pp. 35.

[160] Ibid.

duPont dr N,mours & Co. in the late 1960s. “We approach each project with ‘How many senses can we involve?’” said one of Sensefex’s co-founders. As we’ve seen, appealing to multiple senses was often seen as a way to slip a message past cognitive functions and directly into affective domains. Thus even Reverend Dr. Harvey Cox, a Harvard theologian, offered his keynote address to the 1967  Conference on Church and Society using three movie projectors, a radio, a television set, two tape recorders and color slides. 6654

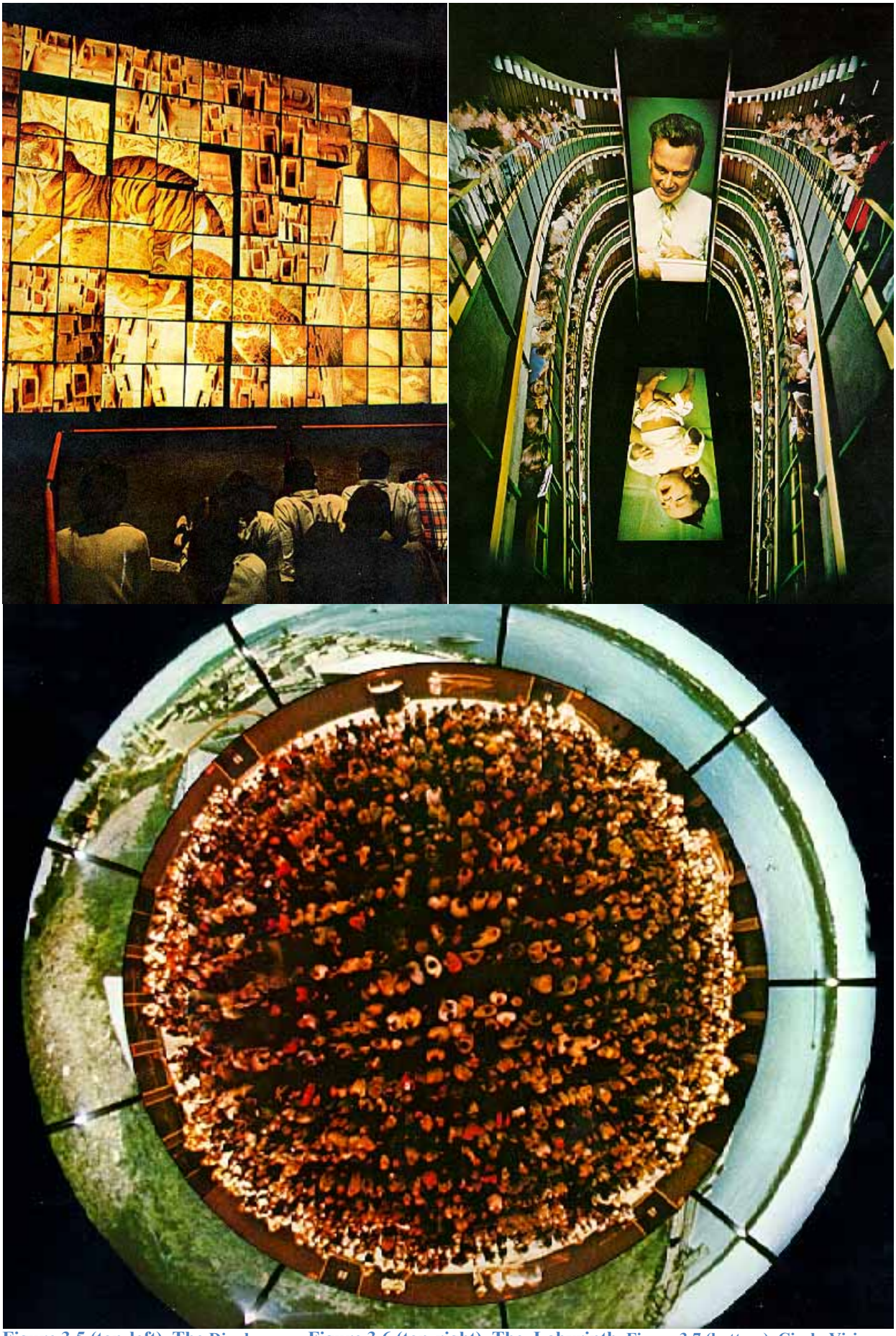

**Figure 3.5 (top-left). The Dioplyecran. Figure 3.6 (top-right). The Labyrinth. Figure 3.7 (bottom). Circle-Vision 360.**

Expo 67' held in Montreal was in some ways the pinnacle of the intermedia vogue of the late 1960s. More than any World Fairs before it, the pavilions at Expo 67 were audio-visual wonderlands, total optical and aural experiences. Janine Marchessault, professor of film studies at York University has argued that Expo 67 was "a pivotal precursor to the multiplication and interconnectedness of screens that characterize twenty-first century digital architectures." Media scholar Gerald O'Grady has argued that Expo 67 was the most important media experiment of the 20th century. In fact, a full sixty-five percent of the pavilions at Expo 67 presented moving images, some with dazzling complexity. "The grander and theme pavilions featured multi-million dollar shows which explored the latest optical technology," Judith Shatnoff described Expo 67 for *Film Quarterly* readers, "multiple-dimension films, multiscreen, multi-image, multi-media light and sound experiences."[161] Films came on one screen, Shatnoff described, two, five, nine wide screens, in a circle (Figure 7), 112 cubed screen moving on a wall (Figure 5), a film "labyrinth" (Figure 6), a 70mm film frame broken into countless screen shapes, screen-mirror complexes that projected images to infinity, a screen made of running water and a dome screen. These new audio-visual environments were given names by their promoters: Circle Vision, Polyvision, Kinoautomat, Diapolyecran and Kaleidoscope.

Entrepreneurs and counter-cultural figures trying to temporarily alter individuals' sensory experience with new media environments were working under the assumption, widespread in the 1960s, that the new electronic order of things was transforming the human sensorium generally. Some focused on the increased orality of the new era, others on the importance of visuality. Marshall McLuhan, who Brockman and all other intermedia artists and advocates constantly cited (some called Expo 67 "McLuhan's fair"), popularized the connection between electronic

[161] Shatnoff, Judith. "Expo 67: A Multiple Vision," *Film Quarterly*, Vol. 21, No. 1 (Autumn, 1967). Pp. 2.

media and sensory equilibrium. McLuhan proffered the idea that different media appeal to the senses with distinct sense ratios together with the notion that the senses were interdependent in such a way that when a dominant media appealed nearly exclusively to one sense it set all in a state of disequilibrium. "The electronic media together add up to an externalization of our sensorium," he argued in a 1960 report commissioned by the National Association of Educational Broadcasters (NAEB), "No change in technology can touch us save by altering the existing ratio among our senses. The nature of sensation being itself comprised of a ratio among our various senses, any increase or decrease of intensity in any sense area immediately affect our awareness of the other senses."[162] It wasn't just that one media might, for instance, emphasize the visual register and thus create an evnironment where our other senses atrophied. It was this, but it was more. The senses were organized, McLuhan offered, such that intensifying one increased and/or decreased all the others to new levels, like readjusting all the dials on a five channel equilizer. For instance, McLuhan predicted that the introduction of television would see Americans eating more spicy food. Thus, McLuhan maintained, perhaps most popularly in his famous axiom, "The medium is the message," that media scholars and media makers should not be concerned with media content so much as how it changed the ratio of our everyday sensory experience. "We may be forced, in the interests of human equilibrium," he told the NAEB, "to suppress various media as radio or movies for long periods of time, or until the social organism is in a state to sustain such violent lopsided stimulus."[163]

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[162] McLuhan, Marshall. *Report on Project in Understanding New Media*. New York: National Association of Educational Broadcasters, 1960. n. pag.

[163] Ibid.

In 1960 McLuhan didn't feel that we had come to a point where such action was necessary, but he did feel that electronic media had shifted a crucial sensorial balance, returning society to a more tribal-like aural-oral culture. McLuhan was just one of a number of new media scholars in the 1960s who argued that the electronic age was a return to an oral culture and juxtaposed it to the predominantly visual world of the print era. "The changes in today's sensorium as a whole have been too complex for our present powers of description," wrote Walter Ong in 1967, "but … the new age into which we have entered has stepped up the oral and aural."[164] Modern communications did not slight the visual by any means, Ong and others argued, but they gave more emphasis to the oral-aural than did print. Television, which media scholars took to be the most transformative medium of the era, was just as, if not more, aural than visual. Images emanating from a television screen lacked real detail (as opposed to photographs or film); the audio did not. For instance, while silent film was at one time an option, Ong argued, silent T.V. could never be an "engaging prospect." Thus, while oral culture was aural in nature, and print culture was primarily visual, the post-print era was both.

While some focused on the increased role of the oral-aural in a world of electronic communications, others focused on the importance of the visual. "Visual literacy" became a topic of widespread concern among educators and scholars in the mid-to-late-1960s.[165] But here, the focus was less on a new balance or even an imbalance in the sensorium, so much as the integrative function of vision in an increasingly un-integrated world. "The heightening of sensibilities involved in learning to be 'visually literate,'" argued Martin Dworkin, at the first

[164] Ong, Walter. The Presence of the Word: Some Prolegomena for Cultural and Religious History. New Haven, Connecticut: Yale University Press, 1967. Pp. 88.

[165] See for instance, Benning, Virgina. An Annotated Bibliography Concerning Visual Literacy. Unpublished Report, 1973.

Conference on Visual Literacy in Rochester, New York in 1969, "should be in the direction of the integration of the self."[166] One of the leading spokesmen for such a concept, Gyorgy Kepes, often cited by "visual literacy" and "aesthetic education" advocates, promoted a systematic philosophy of vision which went largely unrecognized until the mid-1960s. At the heart of Kepes's philosophy of humankind lie a conviction that vision was both the key to being a fully integrated human and to properly ordering the chaos of so much recent scientific knowledge, technological innovation and urban reorganization. In Kepes estimation, the human experience had become dangerously compartmentalized—people responded to leisure and entertainment with feeling, science and technology with reason and to art with perceptual sensitivity. Since visual forms communicated on a sensory, emotional and intellectual register, only they could restore the unity of humankind's experience. "Our task is to face the present with the courage of an open eye, an open heart, and an open mind. We cannot renounce the new scientific efforts and technological achievements of the twentieth century because they were bought by human distress," Kepes wrote in the introduction to The Education of Vision (1965), "Our central faculty in performing this task, as we have suggested, is visual sensibility. Thus a key task in our time is the education of vision—the developing of our neglected, atrophic sensibilities."[167] Kepes had advocated his philosophy of vision for many decades, but in the mid-1960s, such a philosophy was ripe for embrace. From 1965-72 Kepes conceived and edited a widely circulated seven volume series titled *Vision + Value*. The series brought together an impressive interdisciplinary group of scholars including physicists, urbanists, musicologists, architects, mathematicians, cyberneticists, philosophers, aestheticians, curators, graphic designers,

[166] Dworkin, Martin. "Toward an Image Curriculum: Some Questions and Cautions," *Journal of Aesthetic Education*, Vol. 4, No. 2, (Apr., 1970). Pp. 132

[167] Kepes, Gyorgy. Ed. The Education of Vision. New York: G. Braziller, 1965.

psychologists, composers, educators and anthropologists. The series acted as a platform from which Kepes and those who shared aspects of his ideas could work out systematic view of the role of vision in the life of man. But perhaps more revealing, in 1967 the Massachusetts Institute of Technology funded Kepes' Center for Advanced Visual Studies, a community of scholars, technologists and artists dedicated to, among other things, promoting the integrative function of vision in the modern world. "Vision is a fundamental factor in human insight," Kepes wrote in his proposal to MIT, also published in *Daedalus*, "It is our most important resource for shaping our physical, spatial environment and grasping the new aspect of nature revealed by modern science."[168]

The importance of vision, and the senses in general, for unifying individuals' increasingly fragmented experience of the world was an idea whose time had come. Particularly among humanists. "We need to sharpen all our perceptions, to see, hear, and even to taste, touch, and smell many material and immaterial environments with greater accuracy," argued Bruce Dearing, professor of English and Humanities and President of the State University of New York, Binghamton, while speaking about the role of the humanities in the age of automation.[169] The aesthetic education movement was part of this new humanistic focus on the senses.

In higher education, the movement lacked expansive federally funded projects and instead took the form of new offerings in courses and programs of study in "aesthetic education"

[168] Kepes, Gyorgy. "The Visual Arts and Sciences: A Proposal for Collaboration," Daedalus, Vol. 94, No. 1, Science and Culture (Winter, 1965). Pp. 120.

[169] Dearing, Bruce. "Education for Humanistic Living in an Age of Automation," *Automation, Education and Human Values*. Ed. Maxwell H. Goldberg. New York: Thomas Y. Crowell Company, 1966. Pg. 101.

or "aesthetic studies" by numerous colleges and universities.[170] But a significant portion of the aesthetic education endeavor, and one relevant to our interests here, involved university level humanities educators becoming active in K-12 arts and humanities instructional curriculum reform. The aesthetic education movement, and its commitment to new media, in fact, proved a vital way for humanists to become more socially engaged by contributing to expansive K-12 educational reform, reform centered on the visual literacy and sensorial dexterity of the youngest citizens of the electronic generation. All the largest projects—the Allied Arts Project, the Aesthetic Education Project, the CUE project and the Aesthetic Education Program —were run by university based humanities scholars, the later by the one of the nation's leading philosophers of aesthetic education. "A problem exists for the scholar in the humanities," wrote Richard Colwell in his report on the Aesthetic Education Project at the University of Illinois, "how is he to provide a better education in the arts for every school child within the existing framework … [such that it] develops aesthetically aware citizens?" According to Stanley Madeja, director of The Aesthetic Education Program at The Ohio State University General, the movement emerged from "an agreement among humanists that children were being shortchanged … children were missing the chance to learn how to experience, judge and value, the aesthetic in their lives."

Aesthetic education, in both K-12 and higher education, ultimately constituted a humanistic attempt to get students to order their experience of an increasingly media-rich and technologized world by developing their sensual capacities. "During the past several decades technology and technics have contributed to a media and knowledge explosion," wrote Kenneth Tidwell, the director of the Aesthetic Education Program in 31 schools in Alabama, Florida, and

[170] Reese, Sam. "An Implementation of the CEMREL Aesthetic Education Program by Elementary Classroom Teachers: A Qualitative Observation," (PhD diss., University of Illinois at Urbana-Champaign, 1981). Pp. 2.

Georgia, "Bizarre images, sounds, and actions generated at incomprehensible speeds compete for our attention and often prevent sound judgment."[171] As one can imagine, with a philosophy focused on developing sensual competency and dexterity, the instructional units in aesthetic education curricula were structured around media—television programs, slides, photographs, films and audio recordings. But the use of media was about more than just offering a sensorial antidote to the purely verbal or written description of art objects; a visual rendering of a painting, or an audio version of a poem. It was about getting students to engage the world around them with a heightened perceptual sensitivity.

Take for example, the Culture, Understanding and Enrichment (CUE) project instituted in the arts and humanities programs in 13 high schools in New York from 1963 to 1966. In their 1966 report, the directors of the program argued, the true aim of "training in visual perception" was not to impart the skills necessary for the enjoyment or the production of art. Rather, it was for "the education of the emotions for intelligent living in a complex, ever changing environment."[172] "In relatively static societies such as those which existed in the Middle Ages," the authors went on, "the individual could be taught what to think and do, and how to interpret the environment, or reality, entirely by examples from the past."[173] But in a world where "the only constant is the assurance of continuing, rapidly accelerated change" it was no longer enough to tell students *this is how you should make sense of your world*, or even, *this is how we have traditionally made sense of our world*. One had to provide students with the skills, in this case, visual skills, necessary to make order and meaning themselves. Only then could they continue to

[171] Field Trial of Wisconsin Design for Reading Skill Development and CEMREL. Final Report.

[172] Allen, James et al. The Cue Report: 1966. New York State Education Department, Albany. Report Number NDEA-VIIS-324. Pp. 4.

[173] Ibid. Pp. 4-5.

make sense of their world as their environment radically shifted every 10 years, then every 5 years, then, perhaps, every year.

The way to do this, the creators of the CUE program, argued was through the use of media. On the one hand, media was "education through vision" at a time when increasing change manifested itself visually—the rapidly changing urban setting, increasing mobility and of course, the media environment itself, which was "becoming increasingly visually oriented." On the other hand, the nature of new media promoted a different kind of engagement with information. Books were ideal devices for the indexical, linear transmission of facts. The screen, however, or "new media" generally, was best suited for getting students to critically engage reality--to interrogate actual occurrences in the world. The visual register (especially in combination with audio) was more appropriate for getting students to perceive inter-relationships and to search for meaning amongst a myriad of stimuli. The latter was seen to be absolutely essential in a world of accelerated change. "The school is still book and fact oriented," the authors of the CUE report argued, "Such education continues to promote the single line progression of thought which is not adequate to fully interpret the complex environment of today's world."[174] On the other hand, media promoted "the education of the eye" which itself encouraged "the visual study of [one's] environment." In short, "visual communication …provides for the simultaneity of stimuli which occurs in real life situations."[175] Engagement with media on the visual or in multiple registers helped students order their increasingly visual world by teaching them to take the "myriad of stimuli in [their] environment and [putting the student] in the habit of perceiving relationships and searching for meanings."

[174] Ibid. Pp. 6.

[175] Ibid. Pp. 5.

Aesthetic education was thought to educate the emotions in an analogous fashion—by revealing critical interrelationships. More specifically, aesthetic education was thought to teach students to integrate their affective and cognitive domains in responding to objects and events in their environment. Such integrated responses came from a "third domain." Aesthetic education practitioners often referred to this kind of response as "enlightened cherishing," a term coined by Harry Broady, director of the Aesthetic Education project at the University of Illinois and meant to be shorthand for a judgment of both intellect and affectation.[176] An aesthetic experience, advocates argued, is one in which all aspects of an object or event is comprehended as a total; medium, structure and content come together to form meaning. One experiences the "integral interrelationships between" these potentially diverse elements where the medium is sensual, the content is intellectual and the structure is potentially both.[177] Like Kepes, aesthetic education advocates believed that this kind of unifying experience played a critical role in a world increasingly fragmented by an explosion of knowledge and media and by rapid change generally. "Aesthetic experience depends upon an individual's ability to discriminate those qualities of media, structure, and content from which meanings are created," argued Kenneth Tidwell, "Society needs not only the production and distribution of knowledge but also the active search for cultivation of sensitive and competent judgments."[178]

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[176] See Broudy, Harry S. "The Role of Humanities in the Curriculum," *Journal of Aesthetic Education*, Vol. 1, No. 2, Autumn, 1966.; Smith, Ralph A. "Editorial: On the Third Domain. Film Study as Aesthetic Education," *Journal of Aesthetic Education*, Vol. 3, No. 3, July, 1969; Colwell, Richard. *An Approach to Aesthetic Education, Vol. 1. Final*

*Report.* University of Illinois, Urbana. College of Education, 1970.

[177] Ibid. Colwell, Richard. Pp. 33.

[178] Tidwell, Renneth W. et al. Field Trial of Wisconsin Design for Reading Skill

Thus the aesthetic education movement was born out of the deep social engagement of humanities educators. It was an effort to educate the sensual and affective aspects of life at a time when numeracy and other practical skills were, according to some, overemphasized in the curriculum; it was an effort to bolster the appeal and relevancy of the arts and humanities by bringing them into closer curricular unity; it was an effort to get students to critically engage their information- and media-overloaded environments. In the end, it was an effort to re-orient the use of educational media for more humanistic purposes. "If one values humanism as an element in the educational process, an element not only to be maintained at its present level, but to be augmented, how is this to be accomplished within the ongoing movement toward increased systematization and technology?" Stanley Madeja, second director of the Aesthetic Education program at the University of Ohio, asked on the pages of *Instructional Technology*, "One answer is inherent in the nature of the aesthetic experience as defined for the Aesthetic Education Program…[that program] offers a unique opportunity to evolve an instructional resource which is humanistic in its substantive base."

Unfortunately, it was the movement's commitment to educational media that ultimately hindered its development. Aesthetic education advocates shared the view, common in the mid-to-late 1960s, that the text would soon cease to dominate the classroom. In 1986, Stanley Madeja, the, offered this reflection:

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Development and CEMREL Aesthetic Education Program: Final Report. Southeastern Education Laboratory., Atlanta, Ga, October, 1972. Pp. 49.

> It was anticipated that in ten years, i.e., by the 1970s, the curriculum would be less dependent on textbooks and be made up of flexible units of study which had a variety of non-text materials to assist teaching and learning. This prediction proved drastically wrong…the textbook remained the predominant mode of instruction. Economics played a major role in the decision to continue instruction from texts as schools were faced with reductions in the amount of monies available for instruction. Thus the Aesthetic Education Program introduced its units into the schools at a time when most schools were purchasing fewer rather than more multimedia materials.[179]

In fact, despite the pervasive rhetoric of educational technology enthusiasts and the electronics industry in the mid-to-late 1960s and despite the widespread interest or apprehension among educators—humanists included—education did not move beyond the text in any significant way. Like instructional film in the 20s, radio in the 30s and television in the 50s, the educational technology movement of the 1960s failed to sustain itself—the electronic revolution in education never took hold. The technologies never disappeared and educators continued to use audiovisual materials to supplement instruction to be sure, but large scale experimentation dwindled rapidly in the early 1970s and with it, the vision of a largely electronic, multi-media, post-print educational world. Industry and enthusiasts were flummoxed. The classroom of the 1970s remained essentially the classroom of the 1960s, which itself was essentially the classroom of the 1950s and earlier. The age of educational media on offer in *Boy's Life*, and in

[179] Madeja, Stanley S. "Reflections on the Aesthetic Education Program," *Journal of Aesthetic Education*, Vol. 20, No. 4, 20th Anniversary Issue (Winter, 1986). Pp. 90.

*Library 21*, that vision of education dominated by electronic multi-sensory equipment promoted and promised by industry and enthusiasts simply never arrived.

A number of theories have been put forward which attempt to explain the recurring failure of technological innovation in education; why instructional technologies fail to revolutionize education or why they never gain more than a limited acceptance. In fact, educational technology advocates, especially in the late 1980s as the microcomputer entered the classroom, have spent a good amount of time wringing their hands over the question of failure—a necessary exercise, they feel, if they are to envision a process which better secures widespread acceptance of a contemporary educational technology. Prevailing explanations always come down to teacher resistance, sometimes thought to be the result of poor teacher training, other times, the loss of classroom or curriculum control, but almost always, the lack of communication between teachers, on the one hand, and policy makers and hardware producers, on the other. Most scholars turn to Larry Cuban's analysis in *Teachers and Machines* in which he posits a four-step cycle that repeats itself with the promise of each new educational technological revolution—a cycle comprising "exhilaration," followed by "scientific-credibility," "disappointment," and finally "teacher-bashing." According to Cubin, disappointment sets in when, after some experimentation, educators realize both, that a new technology is not nearly as magical as boosters claimed and that their questions and concerns regarding that technology will not be addressed. This lack of communication continues after the fact as those invested in the new technology nearly always label teachers as luddites:

> Thus what boosters of electronic technology frequently label as teacher stubbornness in embracing innovations can be viewed from the perspective of

> power: Whose questions count? Teachers ask very different questions of new classroom technologies … [questions] anchored in the classroom, an arena largely foreign to nonteachers. Policy makers who adopt innovative technologies and ship them into classrooms ask very different questions about productivity, equity, and cost …and teachers whose questions have been unsolicited, much less unanswered, close their doors and use what fits their students.

A 1971 Ford Foundation study charged, in part, with discovering why instructional technologies had not been adopted as predicted in the mid-1960s, cited miscommunication as a primary impediment. In the report, teachers were charged with the inability to communicate the goals of education as well as holding misconceptions about reforms; "hardware people" were charged with assigning teachers a secondary role, or no role at all, in the planning and implementation of new technologies and in general with producing those technologies while having "little concern for the psychology of the classroom teacher."

Even within the overzealous climate of the mid-1960s, teacher resistance was always an issue. While some educators cautiously experimented with, and others enthusiastically adopted, new classroom technologies, many failed to see the allure. By the end of the decade, it was becoming frustratingly clear to advocates that the myriad of new instructional technologies on offer in the early to mid-decade were not going to reach adoption levels necessary for any wholesale transformation in education. They would, in other words, like educational film, radio and television before them, remain minor supplements in the curriculum. And once again, teachers were blamed. "With few exceptions, instructional technology has failed to live up to its expectations," William VanWyck, director of instructional resources at Delhi State University

New York, wrote in 1975, "Although some can legitimately claim that lack of financial resources…have hampered efforts to innovate, the largest single factor affecting adoption is teacher resistance."[180]

When the American classroom failed to "go electronic," industry—that group who had taken upon themselves to imagine and create the "push-button" future of education—began to lose interest. Take for instance the General Learning Company, that joint educational venture formed by Time Inc. and General Electric in 1965. In the mid-1960s the company appeared to be perfectly positioned, out on the forefront somewhere between electronic technology and education. In 1966 Francis Keppel even stepped down as U.S. Commissioner of Education to become its chairman. A year before it formed, in fact, James Linen, the president of Time predicted that the venture would gross a half a billion within its first four years. In reality, the venture recorded heavy losses in those first four years, only going into the black in 1970 after shifting its focus away from electronic technology and toward "instructional packages," mixing print and visual materials with lab equipment. "Remember 'the marriage of hardware and software'? Well, the honeymoon is over. Technology's warm, hazy glow has faded," Efrem Sigel, editor of the *Knowledge Industry Report*, wrote of the mid-1960s electronics and publishing house mergers.


**Figure 3.8. Phonoviewer by The General Learning Company.**

[180] VanWyck, F. William. "Reducing Teacher Resistance to Innovation—An Updated Perspective," in Phillip J. Sleeman and D. M. Rockwell Eds. Instructional Media and Technology: A Professional's Resource. Stroudsburg, Pennsylvania: John Wiley & Sons, Inc, 1975. Pp. 291.

Part of the problem, according to Francis Keppel, was that the overzealous techno-enthusiasm of the mid-1960s allowed parties to move forward with nothing more than a hazy sense of what advanced electronic education would look like. Industry moved forward too quickly and without a sense of what was needed or feasible. "Neither the products nor the market was ready," Keppel summarized, "Neither of them." The General Learning Company found this out after rapidly producing the Phonoviewer (Figure 3.8X) for the educational market, only to struggle for anything beyond modest sales.

Again, none of this is to say that educational technology up and ended in the early 1970s, just that a revolution in advanced electronic technology never superseded the text in education or culture the way many promised, prophesized or feared. Humanists themselves continued to use audiovisual material to supplement instruction, but their rhetoric about its use changed as the prospect of an impending post-print world subsided.

## Chapter 4 || Electronic Networks, the Socio-Technical humanities and the Invention of Literary Data

Recent histories of digital humanities have consistently passed over their most formative years: early humanities computing of the early-to-late-1960s. Forever forward-looking, contemporary digital humanists have, in fact, spent little time looking back over their history. They have spent even less time examining the first years of robust intellectual and institutional activity of the 1960s. Of those few who have glanced back, nearly all begin in the 1980s with the advent of the microcomputer—that is, with the introduction of the computer into the home, office or department of the scholar.[181] The 1960s has proved decidedly uninteresting to those digital humanists who wish to probe their field's legacy. Within the relatively small literature devoted to this earlier period a consensus has already emerged. Before the 1970s, scholars have concluded, batch processing computer technology was so limited that humanists found few uses for it; those interested in employing computing power to examine language and literature in the early-to-late-1960s, could generate concordances and conduct large-scale stylistic studies of canonical texts. "At this time much attention was paid to the limitations of the technology. Data [was] input laboriously by hand either on punched cards, with each card holding up to eighty characters or one line of text (uppercase letters only), or on paper tape," Susan Hockey writes in the Blackwell Companion to Digital Humanities, "All computing was carried out as batch

[181] For instance, of the eight essays in Blackwell's *A Companion to Digital Humanities* devoted to the field's "History," only one begins before the 1980s. *A Companion to Digital Humanities*. Schreibman, Susan, Ray Siemens and John Unsworth (eds). (Malden, MA: Blackwell Publishing, 2004).

processing, where the user could not see the results at all until printout appeared when the job had run."[182]

It's not difficult to imagine from where this consensus emerged. Even Joseph Raben, the first editor of *Computers and Humanities* (1966-) has characterized the 1960s as a period in which humanists struggled to move beyond mere concordance making.[183] What's more, early computing humanists themselves as well as their funders constantly decried the lack of imagination in moving beyond word indexing (concordances) and word counting (stylistic studies) in these years. On the pages of journals and at numerous conferences, scholars both within and without the humanities warned that the incipient research genre might be stagnant or else stillborn. The challenge of moving forward was already a theme widely addressed in the first issue of *Computers and Humanities* in September of 1966. "Concordances of the poets are rolling off the presses, huge collation jobs are resulting in variorum editions of incredible complexity, bibliographies and indexes of abstracts are becoming available in satisfactory numbers, though perhaps not fast enough to keep up with the information explosion," Lious Milic summarized the situation in the opening article, "The Next Step," "These will be good things and scholars look forward to them, but satisfaction with such limited objectives denotes a real shortage of imagination among us. We are still not thinking of the computer as anything but a myriad of clerks or assistants in one convenient console."[184] In the same issue, Irwin C. Lieb, Professor of Philosophy at the University of Texas and member of the Selections Committee for

[182] Hockey, Susan. "The History of Humanities Computing." *A Companion to Digital Humanities*. Schreibman, Susan, Ray Siemens and John Unsworth (eds). (Malden, MA: Blackwell Publishing, 2004), 5.

[183] Raben, Joseph. "Humanities Computing: 25 Years Later," *Computers and the Humanities*, Vol. 25, No. 6, (Dec., 1991).

[184] Milic, Lious. "The Next Step," *Humanities and Computing*, Vol. 1, No. 1. (Sept., 1966): 3.

the American Council of Learned Society's Fellowships in Computer-Oriented Research, announced that proposals for concordances or stylistic studies—that is, proposals that do not seek out "new or further uses of the computer"—need not apply.[185] Lieb imagined that humanities computing was on the threshold of a "second stage," and it was his intention that the Council help fund this second stage. In the first stage, as Lieb characterized it, humanists looked at the types of tasks traditionally associated with computational power—counting, sorting, storing and retrieving—and asked how those tasks might be applied to the sorts of things that humanists typically do. In the second stage, Lieb made clear, humanists will want to consider what it is that they need done and then ask (literally, ask engineers) how computational power can be adapted or shaped to attain those goals—that is, to explore the new boundaries of computational power beyond sorting, indexing and classifying. Lieb was perfectly willing to admit that he had no idea what this second stage, or projects within it, would actually look like. But he wanted the Council to fund its exploration: "At the start of what may be a second stage, we are trying to set aside the image of the file (as well as some of the calculator images) and trying to imagine computers on different models, we are not sure what--the puzzle, the trip, module constructions."[186]

Nevertheless, a cursory story of early humanities computing which only focuses on the limited nature of early projects or on the frustrations of early adopters leaves untold the ways in which those projects allowed scholars to think through, or rethink, the nature of the text in the electronic era and thus, ultimately, the ways in which their hands-on engagement with electronic

[185] Lieb, Irwin, c. "The ACLS Program for Computer Studies in the Humanities: Notes on Computers and the Humanities," *Humanities and Computing*, Vol. 1, No. 1. (Sept., 1966): 9.

[186] Ibid. It should be mentioned that of the twelve projects funded by the ACLS in 1966, nine of them, strictly speaking, employed computers to count or sort textual elements. See: "ACLS Fellowships," *Computers and the Humanities*, Vol. 1, No. 3 (Jan., 1967): 71-72.

textuality in these years allowed them to participate in technical efforts of social import beyond their scholarship: efforts to curb the information explosion via the establishment of electronic educational networks and improved bibliographic control. Put another way, this standard, abbreviated story of 1960s humanities computing ignores the broader intellectual and socio-technical circumstances—the new nature of electronic information and textuality and the social implications of the information explosion—to which, I argue, early humanities computing projects had direct bearing. Indeed, part of my aim in this chapter is to first, locate the history of early humanities computing within the larger story of humanists' attempt to come to terms with those features of electronic culture which, in total, challenged the nature of the printed page and the enterprise of the humanities and second, to show the degree to which those efforts, as with educational television and technology, ultimately translated to a more socially engaged humanities.

The electronic media upheaval of the 1950s and 1960s had wide raging implications for the humanities, forcing its practitioners to come to terms with the challenging features of its various technologies—television (literature as television); electronic educational multimedia (literature as multisensory and immersive); and computers (literature as data). In other words, just as educational television and multimedia electronic educational technologies allowed and/or compelled humanists to think through the relationship between print, on the one hand, and mass, immersive, affective and non-linear modes of communication in humanities instruction, on the other, so their engagement with computer-oriented research and bibliographic efforts in the humanities required them to think through the nature of machine-readable, networked textuality and its relationship to the bound, printed page. What's more, such efforts gave those involved a needed answer to the "crisis of engagement" in the humanities in these years—allowing them to

get involved in projects of critical social import. Once again, technology, and new media specifically, proved a critical and direct way for scholars to update the aims and functions of the humanities in an era of expanded social responsibility. Indeed, as I argue in this chapter, given the socio-technical context in which it took place, "mere" concordance making had much greater import than cursory histories of early humanities computing have given it. Computerized concordance making—the messy business of translating the countless complicated textual features of the great works onto punch card or magnetic tape—compelled those involved to interrogate the limited nature of print culture and to think of the computer as a "new media" machine as much as it was a machine to process data. This in turn led quickly and directly to their interest and self-professed expertise in electronic networked textuality.

**I. The Computer as an Informational Device**

The information explosion involved, for all groups, a rethinking, at least unconsciously, of the printed page as the definitive setting for information storage and transmission. From the beginning, technical solutions to the information explosion involved moving beyond the bound book--the codex--and towards the electronic organization and networked transmission and display of information. It was within this overall context of responses to the information explosion, and their technical re-organization of information and knowledge in the mid-to-late 1960s that early humanities computing efforts and interest in concordance making, computerized stylistic analysis and ultimately electronic textuality must be seen.

J. C. R. Licklider, psycho-acoustics analyst and computer scientists, put it perhaps most tactfully in his 1965 work, *Libraries of the Future*, itself one of the more legendary responses to the information explosion:

> Books are not very good display devices. In fulfilling the storage function, they are only fair. With respect to retrievability they are poor. And when it comes to organizing the body of knowledge, or even to indexing and abstracting it, books by themselves make no active contribution at all ...the trouble stems from what we may call the 'passiveness' of the printed page. When information is stored in books, there is no practical way to transfer the information from store to user without physically moving the book or the reader or both. Moreover, there is no way to determine prescribed functions of descriptively specified informational arguments within books without asking the reader to carry out all the necessary operations himself.[187]

But computer scientists and information specialists were not the only ones who felt recent advances in information management indicated either the potential or the necessity to move beyond the bound printed page. Somewhere between the necessity of dealing with the information explosion, new cybernetic-based communications theories on information and recent advances in information management, people in key sectors of society and culture, including education, began to think that books and even the printed page were no longer capable of organizing and transmitting the information of the world sufficiently. Many turned to new media

[187] Licklider, J. C. R..*Libraries of the Future*. Cambridge, MA.: The MIT Press 1965. Pp. 4-5.

and machines. "Given the rapid piling up of information in most fields, books are becoming less and less useful as sources of information," the editors of a widely read volume on new media and education argued in 1966, "We assume that the next two decades will see the rapid development of techniques for encoding, storing and searching information, and that research libraries may shortly be linked to one another by means of media that allow not only for information search but also for the reproduction of desired materials for individual use."[188] People in a position to imagine the future of information management—government officials, scientists, librarians, industry and educators--began, in these years, to imagine a world where data and documents could be retrieved on computers or closed-circuit television, where the data and documents held by individuals or institutions would be linked together by networks and where people would learn by engaging a wealth of electronic media.[189]

The information explosion elicited a range of responses from individuals and institutions. The most elaborate called for the automated and centralized storage and transmission of the nation's entire scientific and technical literature. In the post-Sputnik era, the prospect of informational gridlock in the sciences became a national security issue. In congress, the concept of a national information network for scientific research was an idea whose time had come. In 1960, then Senator Hubert H. Humphrey and other members of the Senate Reorganization and Internal Organization Subcommittee, in an effort to avoid unnecessary and costly duplication of scientific research and to provide quick access to all scientific research data, called for a national "Science Information Network." In the House of Representatives, the Ad Hoc Subcommittee on

[188] Rossi, Peter H. and Bruce J. Biddle. The New Media and Education. Chicago: Adline Publishing Company, 1966. Pp. 39.

[189] Using Google Ngram viewer, one finds that the use of the word "network" went up 25% from 1960 to 1970 while the use of the phrase "information network" increased by over 450%.

a National Research Data Processing Center and Information Retrieval Center called, in 1963, for a similar arrangement, the Science Data Processing Center.[190] The White House responded as well. In 1962, President Kennedy and his science advisor, Dr. Jerome Wiesner established a panel comprised of the president's Science Advisory Committee to investigate the information management and communication practices of the nation's scientific community. In 1963 they issued their report, "Science, Government, and Information," originally titled "Science, Government and the Information Crisis." The authors of the report characterized the dilemma this way: Scientific progress depended on a kind of unity of effort which increased specialization now threatened to fragment by breaking science up into innumerable isolated fields. Only improved communication between these fields, the authors felt, could guarantee that innovative connections between diverse research would continue. The authors of the report had two sets of recommendations, First, they openly chastised scientists and engineers for their lack of interest in effective communication: "the technical community must recognize that the handling of technical information is a worthy and integral part of science."[191] In other moments, they offered more direct reprimands: "Write more clearly," "Write better abstracts and titles," and "Spend more time writing thoughtful review articles!" Second, they urged the creation of information centers staffed by both scientists and information specialists. Scientists at the center would perform double duty, spending half their time carrying out research and staying in close contact with their field and the other half poring over documents and reports from their field, summarizing and indexing their contents.

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[190] Committee on Scientific and Technical Communication. *Scientific and Technical Communication: A Pressing National Problem and Recommendations for Its Solution*. Washington D.C.: National Academy of Sciences, 1969. Pp. 242.

[191] President's Science Advisory Committee. *Science, Government and Information: The Responsibilities of the Technical Community and the Government in the Transfer of Information*. Washington, D.C. 1963.

The material result of these centers would be the centralization and wider dissemination, via remote-access, of critical scientific and technical information. The *New York Times* characterized, with optimism, the nature of scientific research when such centers finally brought the vast new hordes of data under control and at last leveraged it toward greater human achievement:

> The young researcher in Texas had picked up a clue, in the behavior of an obscure virus, suggesting a link with cancer. He needed desperately to know, whether anyone had experimented with this virus. His university librarian punched out a series of signals on a small console. They travelled to a distant electronic archive and, within seconds, the console printed out a list of 23 reports on the subject, with brief descriptions of each. The researcher quickly spotted one dealing directly with his problem--work done several years earlier at a Central European, university.[192]

Neither this system, nor the science networks and centers called for by congress were built at this time. Fears that centralized governmental management of scientific communication would constrain innovation further always halted any concrete plans for such systems. Detractors of such plans consistently argued that it was up to the scientific community itself and to the professional organizations and societies within individual fields, in particular, to improve the organization of and access to information on current research. This is precisely what happened.

[192] Sullivan, Walter. "Science," *New York Times*, June 7, 1964. Pg. E11.

The information explosion offered two separate but related technical problems. The first, was how to organize all the new information, the second, was how to make it all accessible, that is, how to display or transmit it more effectively and efficiently. In the early 1960s—not so coincidentally--a number of new systems offering solutions to both sets of problems became feasible. For the first problem, reference retrieval systems were built, for the second, document retrieval systems. Both were part of a new genre of machinery called information retrieval systems. As the information explosion became more widespread the electronics and data processing industry sensed a shift in national needs. In the 1950s, the industry's focus had been almost exclusively on developing computing power; that is, getting machines to calculate, analyze, and in general, manipulate numeric data. In the 1960s, "information retrieval" or "IR" promised, according to some, to become "what electronic data processing was to the 1950s."[193] Data processing machines manipulated numeric information fed to and distributed from it via punch cards or magnetic tape. Information retrieval systems were instead built to index and organize information—for instance key words--on documents or to actually store and make accessible microfilm of documents.

In the early to mid-1960s, the first type of systems--reference retrieval systems--were employed by a number of professional fields. The earliest such systems were developed in the fields of chemistry and medical science. In 1963 the American Chemical Society began producing its monthly index, *Chemical Titles*, from computer memory.[194] The next year the

[193] "Microcard File System Displayed," *Los Angeles Times*, Jul 16, 1961. D1.

[194] In 1966 the American Chemical Society added the Chemical Information and Data System (CIDS), a database of the expanding catalog of chemical compounds which could be accessed remotely. Users could submit queries via a remote teletype writer and call up information on a given compound, its molecular and structural formula, compound descriptors, bibliographic references and a new registry number for the compound assigned by ACS.

National Library of Medicine established MEDLARS, the Medical Literature Analysis and Retrieval System. By 1966 several dozen such systems were operating in the United States. In these years reference retrieval systems were limited to human indexing. Literature analysis would review articles or abstracts and decide how they should be indexed, that is, what key words should be associated with the contents of the article. All relevant information associated with the article, including those key words, would be input into computer memory. A monthly index for the field could then be produced by processing a global string containing all keywords relevant to the field. Finally, unique keyword searches could be processed for researchers by special request. Other systems went slightly further by committing to computer memory the full text of a given body of documents. In 1964 the University of Pittsburg, for instance, stored on magnetic tape the entire text of Pennsylvania law, the health statutes of 11 states, and selected statues from the Federal Code. The entire corpus could be keyword searched by researchers.

While these indexing and retrieval systems helped manage the avalanche of new research and publications, remote full-text access was always seen as the ultimate goal in bringing the increasing corpus of information under control. From the beginning, the National Library of Medicine began developing a graphic-image storage and retrieval system to permit full-text access of its documents. "NLM visualizes a network which will efficiently acquire and provide rapid dissemination of published literature, unpublished material, bibliographies and indexes," imagined Dr. Martin Cummings, the director of the National Library of Medicine, "Optical or electronic linkages between libraries will make it possible for anyone to enjoy and be enriched."[195] The National Library of Medicine in Bethesda. Maryland was not alone. In the early to mid-1960s, many public libraries, research university libraries and even the library of

[195] "RX for MDs: Citation by Automation," *EDUCOM*. September 1966,. Vol. 1. Number 6.

congress drew up plans to automate their cataloging, search and retrieval systems and investigated ways to connect either the record of their holdings or microfilmed renderings of their holdings themselves to other institutions--multimedia learning centers at colleges and universities, laboratories and, of course, other libraries.

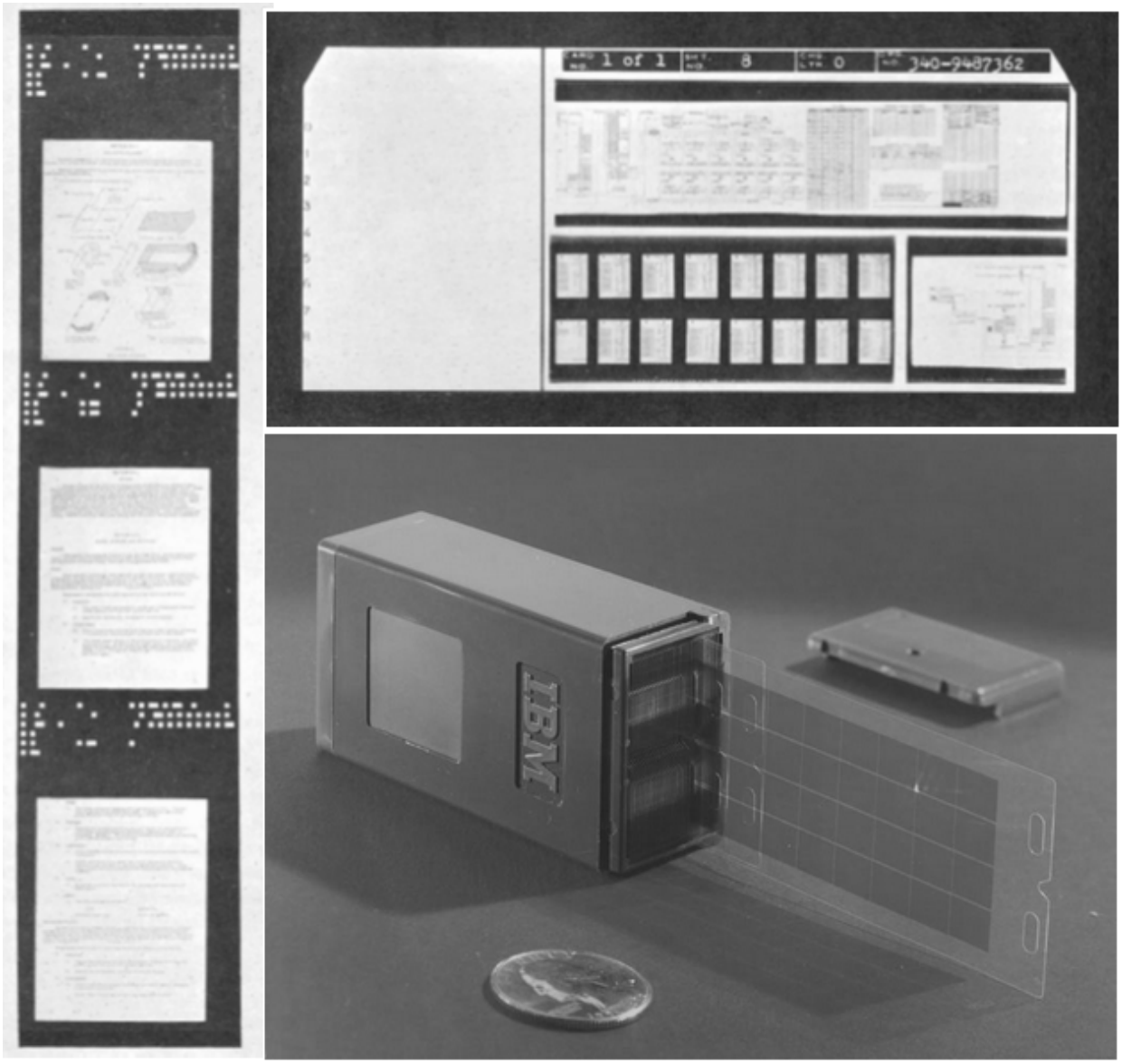



**Figure 4.1 (Left). Documents stored on continuous microfilm with machine-readable bibliographic data for each document above it. Source: Bourne, Charles P. Methods of Information Handling. John Wiley & Sons, Inc., New York: 1963. Pp. 202.**

**Figure 4.2 (top-right). Aperture card containing microfilm of 8 document pages. Machine-readable bibliographic data located on the left of the card. Source: Bourne. Ibid. Pp. 198.**

**Figure 4.3 (bottom-right). One cell for the IBM Walnut System containing microfilm of 450 pages. Source: IBM Manual and Principles of Operation for 1360 Photo-digital Storage System.**

Hopes that library holdings could be electronically shared among multiple libraries and institutions was based on another set of technologies under development in the early to mid-1960s—document retrieval systems. By the mid-1960s, these systems had been employed by a number of private firms and government agencies to centralize and manage internal documentation. Some systems used microfilm rolls, others used microcards. In both instances, film-images of document pages were reduced by as much as 60 times their original size and each page-image was placed next to machine readable indexing data relating to its contents (Figures 4, 5 and 6). The Command Retrieval Information System, developed by Information for Industry in 1962 could fit 500,000 document pages on one 400 foot real of microfilm. IBM's Walnut system used microcards arranged in cells (Figure 6). Each cell contained 50 strips of film, each with 99 document images. Each Walnut system came equipped with 200 cells (one memory store) and thus could hold 990,000 document page images. Each Walnut system was built to handle up to 100 memory stores for a theoretical total of 99 million document pages. In all systems, a user could keyword search for documents or document pages indexed. With many systems, document pages were merely projected onto a screen for the user to read. But with a few, such as IBM's Walnut, the document image could be sent electronically to a television. It was this last development that had librarians investigating ways to transmit the content of books and journals to multiple locations.

In some ways the field of library science was hardest hit by the information explosion. "Casual users of libraries are hardly aware of it, but library professionals and their more conscientious clients know about it all too well. They call it the 'information explosion,' *Time Magazine* summarized the dilemma mid-decade, "the technical disciplines—chiefly the sciences—have turned loose such a Niagara of information that even the wealthiest of corporate,

collegiate or community libraries simply do not know what to do with it, let alone how to make it available to researchers."[196] The only answer to "suffocation by paper" was, of course, automation. In the early to mid-1960s, every major professional library organization, including the American Library Association and the Council on Library Resources, which was funded by the Ford Foundation to address issues of library expansion, was invested in imagining the future of libraries. On the one hand, they funded numerous studies and held countless conferences exploring the technical solutions to the impending bibliometric crisis outlined. On the other hand, these same organizations created elaborate exhibits which presented to the public futuristic visions of "push-button" libraries and learning, replete with automated information systems and multimedia instruction. In the first half of the decade, the United States hosted two World's Fairs, the first in Seattle (1962), and the second in New York City (1964). Both contained large exhibits which offered just this vision to the public. Library 21 was the American Library Association's contribution to the Seattle World's Fair of 1962, the Century 21 Exposition. The project was funded by the Council of Library Resources and was intended to demonstrate "the importance of making fuller use of recorded knowledge and information." But what the 1.8 million visitors to the exhibit experienced when they entered was a bright, colorful, ultramodern environment of education and culture, an almost Jetsons-like vision of future information management, transmission and display. As visitors entered the exhibit they first made their way into the Automated Library Service Center. Here, they were greeted by a UNIVAC mainframe equipped to help visitors perform "research." Visitors could fill out a form about themselves and indicate a subject they were interested in. The UNIVAC would return an annotated bibliography based on their area of interest, their age, sex, education and reading level. Eighty-four thousand

[196] "Libraries: How Not to Waste Knowledge," *Time*. September 3, 1965.

such "personalized bibliographies" were produced for fair goers. Visitors could also "converse" with the great minds of Western Civilization by receiving printouts of quotes from the Great Books of the Western World relevant to their specified area of interest.

In the next room visitors encountered the Learning Resources Center with study alcoves or "quest spaces" for independent learning. Each alcove contained a dual track tape recorder, a closed-circuit television, a slide projector and a teaching machine. The dual track recorder made it possible for visitors to listen to a lesson in French, respond, and then replay both the French instructor and then their own voice. The teaching machines contained lessons for first year algebra, computer math, and bridge. Surrounding these alcoves additional closed-circuit televisions broadcast lectures on physics and a televised version of Hamlet.

Two years later, the American Library Association was again present at the World's Fair, this time hosted by New York City. Library/USA, as the exhibit was called in New York, was largely similar to its counterpart in Seattle.

One room contained a large mainframe where visitors could "research" topics, another room acted as a futuristic multimedia learning environment. But given recent advances in technology and the large sponsorship of American Telephone and Telegraph, there was a larger focus in 1964 on networked communication. This year the mainframe was connected by telephone lines to other machines across the

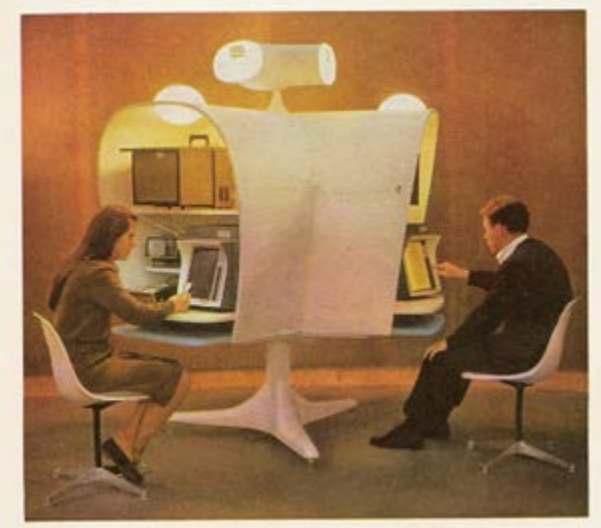


**Figure 4.4. Self-instructional study carrels located in the Library of the Future Exhibition. Source: New York World's Fair 1964-1965: Official Souvenir Book. Time-Life, New York: 1965.**

country, specifically to other Univac 1004s. People at these other destinations could request information from the mainframe in New York, just as though they were at the World's Fair.[197] In the next room, visitors could dial up the call number for a book and hear a summary and review by a professional librarian.

**II. The Computer as a Media Device**

For the electronics industry, library science, social scientists and engineers, and even for those in the general public paying attention, solutions to the information explosion involved freeing information from the printed page. Humanists interested in the relationship between computing and textuality in these years had similar concerns. Just as with educational television in the 1950s and the electronic revolution in education in the 1960s, humanists responded to the efforts of the electronics industry and social scientists to re-think and re-engineer the nature of information transmission and knowledge production with analogous endeavors of their own. That is, just as the electronics industry and others hoped to use databanks and computers to free information from the strictures of the printed page, so too early computing humanists hoped that the potential translation of literature to the radically new electronic medium of machine-readable paper or magnetic tape, could free certain aspects of literary study, or even the literary experience, from the confines of print culture. The computer, or more precisely, machine-readable textuality was a potent force in what might be called a *lifting of the veil of print culture* for many humanists in the 1960s.

[197] This feature was no doubt a nice corollary to ATT's new picturephone which also debuted at the 1964 World's Fair. With the picturephone too, visitors in select cities could communicate with those attending the World's fair in New York.

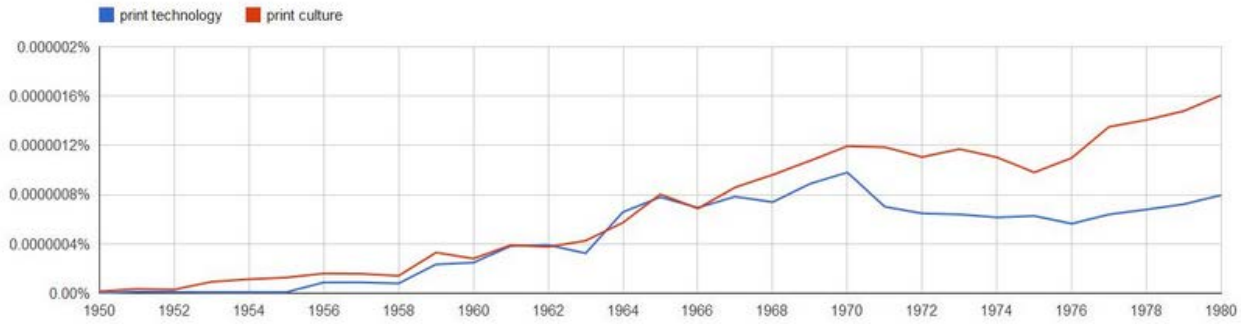
Around every dominant media there materializes an informational ecosystem in which that media's method of delivery structures, among other things, the ways we communicate, the ways we think about what constitutes information and knowledge, with whom it should be shared, the rights of its creators and ultimately the ways we set up and maintain the social and cultural institutions in which that media become indelibly embedded. In some ways, this informational ecosystem is so all encompassing, so totalizing, that very few see it at all. Marshall McLuhan, capitalizing on an old proverb, characterized this lack of social awareness with typical pith, comparing a media ecosystem to water in a fishbowl: "One thing about which fish know exactly nothing is water since they have no anti-environment which would enable them to perceive the element they live in."[198] It isn't until the potential disruption of that ecosystem—a new way or ways of delivering content comparable on scale with the older dominant medium—that it becomes clear to many that they once lived under an older media regime. When a new mode of delivering content equivalent on scale to an older dominant mode becomes feasible, and when that new mode of delivery has implications for re-thinking, for example, who should have access to information and new knowledge, or whether information is better engaged in a linear or associative fashion, there is a unique opportunity to realize that established answers to such questions have been suitably constructed to fit the nature of the older medium. Put another way, each and every time there is a radical displacement of an established, dominant media, or even the potential for its displacement, a kind of veil is lifted; scholars (and non-scholars alike) become suddenly very aware that information, knowledge, culture, and in some sense reality

[198] McLuhan, Marshall. *War and Peace in the Global Village; An Inventory of Some of the Current Spastic Situations That Could be Eliminated by More Feedforward*, (New York: McGraw-Hill, 1968), 175.

itself, had been, under the regime of that prior dominant media, shaped and constrained by its nature, by the very structure with which it imparts information and knowledge.

In the 1950s and 1960s, mass communication in general, and the television in particular, constituted just this kind of potential radical displacement. It is no more a coincidence that "the Gutenberg era" became an object of widespread, critical analysis in first two decades after the introduction of the television any more than the "history of the book" became an established sub-field during our contemporary age of digitization. The fact is, compared to the years before WWII, scholars of the 1950s and 1960s became gripped by the social, cultural and historical study of the book and of print culture. The coming of the "electronic age," it seemed, brought with it the need to study the "Gutenberg era." Print, both as a culture and as a technology became a much more frequent object of scholarly analysis and popular commentary in the years of "electronic media." From 1960 to 1970, for instance, the use of both terms, "print culture" and "print technology," in published books quadrupled.

Casey Man Kong Lum, writing about the emergence of technology-oriented media studies in the 1960s, attributes the lifting of the veil of print culture for scholars not just to the rise of visual media, but more particularly, to the noticeable changes it brought to their students' worldview—a new awareness that their students understanding of the world changed just as their dominant media did. "The rapid succession of advancements in and diffusion of media technology and telecommunications, from the transistor and videotape recorder (VTR) to the satellite… began to challenge the dominance of literacy and print," he argues, "because of the rise of graphic communications in the larger social and media environments, predominantly print-based educators such as [Neil] Postman and his contemporaries began to see subtle and yet profound changes in their classrooms, or, better, in how their students learn or otherwise come to




understand the world."[199] Elizabeth Eisenstein, perhaps the most prominent historian of print culture, also attributes the origin of her interest in the subject to this shift in the 1960s. It was then that she began to encounter pronouncements to the effect that "the age of Gutenberg [was] at an end." Watching scholars react with both lament and support to the contemporary shift from print to electronic communication stimulated her curiosity "about the specific historical consequences of the fifteenth-century communications shift…from script to print."[200]

But visual electronic media in general, and the television as the most potent force in mass communication, in particular, were not the only technologies of representation to allow and/or compel scholars of interest in these years to consider the relationship between the contemporary and Gutenberg eras. For some, the computer had a similar effect. People forget that the computer was more than a machine for processing data. It was also, it must be acknowledged, the recipient and producer of a significant new strain of media— machine-readable cards or tape—a media surely as transformative as film, television and multimedia instruction. Humanists' engagement with this new media of punch-cards and magnetic tape is usually told as a history of humanists' engagement with the computer generally, that is, as a history of their engagement with

[199] Lum, Casey Man Kong. "Notes Towards an Intellectual History of Media Ecology," in Casey Man Kong Lum Ed. *Perspectives on Culture, Technology and Communication: The media Ecology Tradition*. (Cresskill, NJ: Hampton Press Inc., 2006), 17.

[200] Eisenstein, Elizabeth. *The Printing Revolution in Early Modern Europe*. (New York: Cambridge University Press, 1983), xiv-xv.

computational analysis in humanistic research. I want to tell the story instead as humanists' engagement with yet another new electronic media, one that, like television and electronic multimedia instructional technology, challenged the nature of print technology and thus the nature of the humanities enterprise. In short, I want to tell the story of early humanities computing, not as a history of computational technology, but as a media history.

**III. Early Humanities Computing: From Concordances to Electronic Textuality**

The history of automated literary data processing by way of digital computers begins with Father Roberto Busa, professor of philosophy at the Istituto Filosofico Aloisianum. In 1948 Father Busa began giving talks about the possibility of constructing an automated index to the corpus of Thomas Aquinas' writings in machine readable format. The following year Busa was in discussion with Thomas Watson Sr., the founder and president of IBM, who provided Busa with access to a card punching machine, a tabulator, a card sorter and a collator as well as technical council from IBM engineers. By 1951, Busa had produced his first automated word indexes, to four of Aquinas' hymns for the Feast of Corpus Christ. These indexes included an alphabetical list of words along with their frequency of use and a concordance with verse line context for each word in the hymns. Each sentence of the hymns was laboriously punched into machine readable cards which were then fed through the tabulator and/or sorter and collator to produce a count of certain key words, their position in the overall hymn and their context (the first few words before and after the word in question).

From 1951 to 1956, Father Busa indexed nearly two million words of Aquinas' texts by this method and in 1957 established the Center for Automated Literary Analysis with the help of

Paul Tasman of IBM. There they began the automated indexing of the Dead Sea Scrolls and the initial stages of a project that would eventually become the 50-volume *Index Thomisticus*, a comprehensive concordance of Aquinas' works. Nineteen fifty-seven also saw the first automated concordances for humanities-oriented texts in the United States. In that year, Guy Montgomery's automated index to John Dryden's works were produced by the University of California, Berkeley; Stephen Parrish and James Painter began work on the Cornell Concordances, a series of indexes for Mathew Arnold, Yeats and Emily Dickenson; and Reverend John Ellison, of the Church of Epiphany, Winchester Mass., produced the first automated concordance of the King James bible.

Concordances were not the only end-result of humanities-oriented, computer-aided textual analysis in these years. In the early to mid-1960s, as more and more humanists began to embrace computational power as a means to achieve traditional ends within their respective fields, a new genre of data processing began to emerge, sometimes referred to as "literary data processing." Perhaps the most famous of these studies in these years was done by Frederick Mosteller and David L. Wallace who, in 1963, used statistical methods to determine the authorship of the twelve disputed Federalist Papers. Like similar studies conducted in these years, Mosteller and Wallace first tried to use used word and sentence length to determine authorship, only to find such metrics nearly equivalent in the known works of Hamilton and Madison. They turned instead to word choice, or rather, the frequency and distribution of certain words: filler words, like "and," "of," and "the," but also more specific items, like "while" (used by Hamilton) and "whilst" (used by Madison). They then examined the occurrence of each word in successive blocks of 1000 words to show that significant statistical patterns were present.

The early to mid-1960s found humanists exploring the parameters of what computational power could do for their field. Computer-aided statistical analysis of vocabulary opened a number of doors for humanists and they began searching for imaginative uses of such methods. At NYU's Institute for Computer Research in the Humanities, for instance, professor Anna Balakian of the French and Comparative Literature departments endeavored to construct several literary data studies that might better establish the date of Rimbaud's *Illuminations*. The exact date when Rimbaud composed the poems in his *Illuminations* was unknown, or more precisely, whether he composed them before or after his *Une Saison en Enfer*. Because Rimbaud was heavily influenced by particular authors at select points in his writing career –Baudelaire's prose during the period of *Une Saison en Enfer* , Germain Nouveau after 1873 and Verlaine throughout—Balakian proposed comparing the vocabulary of the *Illuminations* with these other authors to help clarify the chronology of Rimbaud's work. Though early computing humanists were habitually engaged in kinds of efforts—concordance making and the quantitative analysis of texts—translating texts into machine-readable formats quickly shifted their interests towards the computer as media maker. By the mid-1960s, the nature of concordance making had spurned a new interest in the nature of networked textuality. When humanists ruminated publically and privately about the methods by which one gets a computer to analyze, Jonathon Swift, for example, they were obviously concerned with the relationship between the features of a traditionally printed text and a new process of computational analysis. At the most general level, for instance, they were interested in how one even gets a computer to answer textual questions of traditional humanistic merit. That is, they were interested in how the *process* of computational analysis could be applied to traditional questions of interest in the humanities. This was, it should be said, their central concern. What can large-scale pattern recognition tell us about literary

style? What is the relationship, as far as computational analysis is concerned, between literature and data, words and numbers? Where is the "quantitative-qualitative barrier" in computer analysis—that is, are counting and sorting words ends in themselves or can their processes be used, for example, to get at an author's "attitudes, values beliefs and opinions"?[201] In short, which aspects of meaningful humanistic textual inquiry can be rigorously formalized and fed into a computer? All these questions were consistently front and center at early humanities computing conferences and in the emerging field's journals and newsletters.


Nevertheless, I want to argue that while early computing humanists were clearly focused on the relationship between texts and a newly salient analytical *process*, they were equally, if less explicitly, concerned with the relationship of printed texts to a new physical *medium*—the machine-readable and potentially networked text. This text was mechanically storable and retrievable and it was algorithmically searchable. But perhaps most importantly, as a text, it was no longer given shape, nor constrained, by the structure of the printed page—the very thing which made it retrievable and searchable. When one analyzes a text with a computer, one frees its textual elements from the order of the printed page and from the structure of the bound book. But one

[201] *Conference on the Use of Computers in Humanistic Research : December 4, 1964 : Sponsored by Rutgers, The State University, and the International Business Machines Corporation*. (New Brunswick, N.J.: Rutgers, The State University, 1964), 15 and 11.

also loses the shape, form and meaning that that order and structure imposed on the text. These concerns did register among the first generation of computing humanists. Turning canonical text after canonical text into a litany of concordances was not just a practical exercise for the expansion and potential re-orientation of humanistic analysis in these years. It was this. But it was also a way to think through the nature of the text itself.

Computerized concordance making required scholars to create a whole other "text"—in fact, it required them to create several. Take for instance the first automated concordance of the King James Bible produced by Reverend John Ellison, of the Church of Epiphany, Winchester Mass., in 1957. Ellison related the tedious process of concordance-making both to *Life Magazine* and in his talk at the Conference on the Use of Computers in Humanistic Research at Rutgers University in December of 1964.[202] Instead of focusing on the ad-hoc, cutting-edge, programming or the computer processing power involved in creating concordances, Elision in describing the process, focused on the many mediating steps required, whereby the contents of one physical media was translated into another and then another to produce the final result. The text of the bible was first copied into two machine-readable formats: 480 pounds of punched cards and 400 reels of paper tape. These punches cards and paper tape were then transferred onto four rolls of magnetic tape each, for a total of eight rolls. These eight rolls were then fed simultaneously into the Remington Rand's Univac to compare and catch errors between the two versions derived from different input methods. The Univac, after making corrections, then produced an accurate master text on four rolls of magnetic tape. These four master rolls were fed again into the Univac, which broke up the text into separate words, each identified according to

[202] "Bible labor of years is done in 400 hours," *Life*, Feb 18, 1957; *Conference on the Use of Computers in Humanistic Research : December 4, 1964* : Sponsored by Rutgers, The State University, and the International Business Machines Corporation, (New Brunswick, N.J.: Rutgers, The State University, 1964).

book, chapter and verse. The result was 63 rolls of tape which were then run through Univac to eliminate unnecessary words, such as "the," "and" "of." This process of elimination produced 26 more rolls of tape. Another run through the Univac coupled each word with its surrounding text—its context. Then the 300,000 entries derived from first process were arranged by Univac in alphabetic order on 26 rolls of magnetic tape. The end product was 120 magnetic rolls of data which Univac could ultimately translate and print up as words on paper. Those printed words on paper were then sent to a publisher, edited, bound and sold as a book.

Producing concordances was not just about subjecting a traditional text to new computational processes. It was also about translating that traditional text into multiple other inter-mediums and ultimately into a machine-readable text. In order to create concordances, literary scholars were forced to get their hands dirty with the written and/or printed structure of canonical works, digging in and tearing apart their chapters, sections, vocabulary, punctuation and graphemes; deconstructing down to the smallest detail, the work of author, scribe and printer. Transferring canonical texts one line at a time onto individual punch cards or continuously into paper or magnetic tape, made them feel, in some ways, less like scholars and more like "a printer when he sets type."[203] Early computing humanists, in fact, encountered much resistance along just these lines. Many humanists deplored the idea of feeding canonical texts into computers not just because the purely quantitative work of computers was thought to be fundamentally opposed to the qualitative, interpretive work of the humanities enterprise, but also, in some ways, because it was felt to be a mutilation of a sacred medium—of print itself. "To a certain kind of sensibility poetry and electronics seem incompatible, and to put lines of

[203] Parrish, Stephen. "Concordance-Making by Computer: It's past, Future, Techniques and Application," in *Proceedings: Computer Applications to Problems in the Humanities: A Conversation in the Disciplines, State University College, Brockport, N.Y. April 4-5, 1969*. (Brockport, State University of New York, College at Brockport, 1970) 19.

verse into a computer, seems grotesque," Stephen Parrish quipped at a conference on Computers in Humanistic Research at Rutgers University in December of 1964. [204] In defending his work and the work of his colleagues in this regard, Parrish made a rhetorical move common among early computing humanists. Translating canonical works from print into machine-readable formats, he argued, was not unlike transcribing the contents of manuscripts into formats compatible with print technology. Both were necessary responses to the large-scale media innovation and upheaval of their time and both were viewed with scorn by many contemporary scholars. "The same sort of pain and disquiet must have been felt," he reasoned, "by people who thought of poetry in terms of illuminated letters on parchment, when they watched the arrival of Gutenberg with his clumsy blocks of movable type."[205]

As the 1960s progressed, computing humanists became more and more interested in the machine-readable aspect of what they were doing. That is, while in the late 1950s and early 1960s, humanists working with computers and texts were still chiefly focused on producing a printed end-product—the book-bound concordance—by the mid-1960s they had become progressively interested in the canonical text on punch-card, paper or magnetic tape they employed to produce those concordances. They became interested in the machine-readable text as an end in itself, as something, once created, to be regularly on offer to a community of scholars or learners. This piece of media, like a printed text, would be passed around, possibly checked out of a central machine-readable literary library or perhaps even passed along an electronic network. More and more, in these years, computing humanists began to imagine a day

[204] Parrish, Stephen. "Computers and the Muse of Literature," in *Conference on the Use of Computers in Humanistic Research : December 4, 1964 : Sponsored by Rutgers, The State University, and the International Business Machines Corporation*. (New Brunswick, N.J.: Rutgers, The State University, 1964), 14.

[205] Ibid.

when a good portion of textual engagement and literary analysis would be performed, not on the texts as represented on the printed page, but on machine-readable works available on a network. In this way, early computing humanists were imagining something on the minds of many scholars in these years—the formation of online intellectual and educational networks.

If concordance making naturally established humanists' intellectual designs and expertise on electronically networked textuality in the mid-1960s, they also had practical and real world interests in such matters. On the one hand, they themselves looked forward to the day when all texts, canonical and otherwise, were contained in a network or networks. Partly for efficiency's sake. Humanists felt a need to make their research more efficient along lines similar to advancements in the sciences, to keep up with the "knowledge-" and "publication-explosion." "The problem for individual scholars today in the humanities is not a dearth of material and interest but a surfeit," Walter Ong wrote in 1967, "If we face this fact, we can better develop or strengthen productive attitudes toward the tools which present-day technology has provided for handling masses of material …We will welcome the computer, for example, which has been invented by present-day man because his unbearable accumulation of knowledge demands this new instrument for storage and retrieval."[206] Thus the collection of canonical texts in machine-readable formats was an early goal of computing humanists.

> So far as data-processing.. . is concerned. .. the tasks of scholarship in the coming years may be defined as the recording on master-tapes of the widest possible array of literary works; ... the duplication of such tapes in key centers of scholarship;.. .

[206] Ong, Walter. "The Expanding Humanities and the Individual Scholar," *PMLA,* Vol. 82, No.4. (Sep., 1967), pp. 1-7.

the searching of the tapes to provide the individual scholars with information ...

and the selective publishing of machine-print made from these tapes.

As we've seen, for this reason, humanists of the 1960s found themselves uniquely aligned with the interests of groups endeavoring to turn text into something that could be read by machines and passed along electronic networks—librarians, computer scientists and the electronics industry. The interests of natural and social scientists in getting texts into machine readable formats were aligned with librarians and others only to the extent that they too wanted to bring the information explosion under control by employing better methods of document organization and dissemination. Humanists, on the other hand, while sharing these concerns about proliferating documentation, were also vitally invested in getting texts—their field's fundamental unit of analysis--into a format which could be stored, read, disseminated and analyzed by computers. Doing so was the equivalent, in many ways, of numeric data processing in the sciences

But keeping up with the electronic revolution, that is, updating the humanities for the electronic era wasn't just about efficiency. In a more abstract sense, getting the Great Works into computer networks or at least into machine readable formats was felt to be necessary—plain and simple—if the humanities were to not fall behind in the rapidly developing electronic era. If translating the Great Works into televisual formats in the 1950s was thought to be vital for the growth, if not survival, of the humanities in a world of electronic culture, so too was getting those canonical texts into machine readable media in the 1960s. This is the direction, many suspected, all future print materials were going. "In a few years every printing house which

wishes to remain competitive will produce a machine-readable version of a text,"[207] wrote Martin Kay, director of a RAND-funded research project "Natural Language in Computer Form," which involved several literary scholars.[208] It seemed equally clear to many, especially those speaking at early humanities computing conferences that all past printed materials would soon find their way into networks. "Imagine the time, then, surely in the foreseeable future," Alan Markman, professor of English at the University of Pittsburgh envisioned at the Literary Data Processing Conference held in September 1964 at IBM's Thomas J. Watson Research Center, "when the entire literature of the world, both of the past and what then currently being produced is permanently in a machine format on magnetic tape."

What's more, humanists, like many other scholars in the mid-1960s envisioned the need for "on-line" intellectual communities. The "online intellectual community" was an idea whose time had come as early as the mid-1960s. Visions for such a community—a real-time, electronic network for the retrieval and communication of information and ideas between scholars—began to take concrete form with the coming of time-sharing computing. Prior to the early 1960s, all computing was done by batch processing, a method whereby users fed a series of data and instructions (a program) into a computer all at once by punch-card, paper or magnetic tape and then waited for the computer to run the program from start to finish without any user intervention. Thus, with batch processing, only one program could be run at any one time; all computing was performed one user and one program at a time. In the mid-1960s, increased

[207] Kay, Martin. "Standards for Encoding Data in a Natural Language" *Computers and the Humanities*. Vol. 1, No. 5 (May, 1967), pp. 171.

[208] Natural Language in Computer Form was a collaborative effort between the Linguistic Project of The RAND Corporation, the Centre d'Etudes pour la Traduction Automatique of the Centre National de la Recherche Scientifique in Grenoble, and the Machine Translation Project at the University of California, Berkeley.

processing speeds allowed developers to design systems where multiple users could execute code from multiple terminals connected to a single mainframe—users could share computing power. Users also shared a core memory, accessing, and in some cases editing, the same files located centrally in the mainframe. This particular feature of time-sharing systems, perhaps more than any other, led many to speculate about the possibility of distributing information access, full-text documents and intellectual collaboration along inner-campus, inter-campus, regional or national electronic networks.

In some ways it's quite amazing, once time-sharing computing was a reality, how quickly scholars and engineers together envisioned the methods of intellectual association that would become the rough features of open access and collaborative communication on the World Wide Web. The first time-sharing system in the United States, Project MAC (Multiple Access Computer, Machine Aided Cognitions), was established in 1963 at the Massachusetts Institute of technology. Project MAC is significant because it was the system around which specific plans for an online scholarly network first emerged. From August to September of 1965 some two hundred engineers, scientists, librarians and scholars from the social sciences and humanities convened at Woods Hole, Massachusetts to formulate a coordinated program of experimentation with an on-line, teleprocessing information network. Dubbed Project Intrex (an abbreviation for *in*formation *tr*ansfer *ex*periments), the project was funded by the Council for Library Resources and the National Science Foundation and was to be carried out by the school of engineering and library system at the Massachusetts Institute of Technology. Users of this network would communicate with each other as well as with the library; data just obtained in the laboratory and comments made by observers would be as easily available as the text of books in the library or

documents in the department files.[209] Early computing humanists were fascinated with INTREX and regularly spoke of establishing similar networks for their own subfields. "Not only could these vast mines of information so vital in the work of art historians, be recorded by machine techniques, but also their transmission to anyone, anywhere could be accomplished by a communication network," wrote James Humphrey, chief librarian at The Metropolitan Museum of Art, "At M.I.T progress along these lines is being made by the use of INTREX."[210] In fact, according to John C. Wells, Assistant Professor of German at Tufts University, on-line scholarly systems in general, and INTREX in particular, provided "an excellent occasion for assessing the situation of the humanist vis-a-vis the computer and for pointing out where real promise may lie."[211]

But early computing humanists' interest in electronic networks was about more than just keeping up with the electronic revolution—about updating the humanities in order to benefit their field of study. It was also about updating the social mission of the humanities. As with educational television and multimedia instruction, humanists who wished to engage new media and technology for practical purposes also found in their engagement a compelling means to offer guidance for the development of that media and technology for larger social purposes. In the case of early humanities computing, interest and expertise in concordance making and in turn, machine-readable textuality, led to their involvement in the establishment of electronic

[209] Overhage, Carl F. J. and Joyce Harman. Eds. *Intrex: Report of a Planning Conference on Information Transfer Experiments*. (Cambridge, Massachusetts: M.I.T Press, 1965), 1.

[210] Humphrey, James. "The Computer as Art Cataloguer," *Computers and the Humanities*, Vol. 1, No. 5 (May, 1967), pp. 168.

[211] Well, John. "On-Line Computation and Simulation: The OPS-3 System by Martin Greenberger; Malcolm M.Jones; James H. Morris; David N. Ness," *Computers and the Humanities*, Vol. 1, No. 3 (Jan., 1967), pp. 109.

educational networks and the development of bibliographic control—both key responses to the impeding information explosion to which humanists in general, and computing humanists, in particular, felt committed. Once again, technology—that critically socially embedded phenomenon of human affairs—proved a direct way for humanists to be engaged in the "day-to-day business of living in this world."

**V. Early Humanities Computing and Educational Networks**

While early computing humanists talked of establishing their own electronic networks and while they were supremely interested in the larger-scale scholarly on-line systems like INTREX then being proposed, they were actually involved in discussions concerning early educational networks. Early computing humanists were not just concerned with the larger social implications of the information explosion, but like those who endeavored to intervene with educational television in the 1950s and multimedia instruction in the 1960s, they were additionally concerned with how electronic solutions to the information explosion would play out. In 1969, for instance, Joseph Raben, editor of first humanities computing journal, *Computers and the Humanities*, opened a conference on Computer Applications to Problems in the Humanities by addressing electronic education. Talking about computer assisted instruction specifically, he asked "Will [computer-assisted instruction] evolve into true teaching, an experience in which the student is lured and encouraged into new discoveries, or will all subject-matter be reduced to the purely objective… Can the child who has been instructed in such a manner … accept the polyvalence and even simultaneous contradictions of the humanities?" His solution was to charge humanists with the task of finding humanistic uses for computers beyond

what they needed to expedite their own research: "With patience, imagination, and conviction we may mold the machine to our own ends. It may emerge as a truly interactive interlocutor, catching the interest of the student, suggesting new lines of inquiry… [and imparting] information [which] must be appreciated as creating or contributing to an intellectual and esthetic whole."[212] What's more, Raben also acknowledged that the status of the humanities in a generation demanding reform and relevance was at stake here. "[This] generation is challenging the establishment on every front. The relevance of the entire humanities curriculum is being evaluated."[213]

Early computing humanists' interests in networked textuality, and concern for the information explosion and electronic education found them intimately aligned with the interests and affairs of the Interuniversity Communications Council (EDUCOM), the organization most centrally involved in the establishment of electronic educational networks in these years. In the mid-to-late 1960s, members of EDUCOM and early computing humanists were closely involved in each other's efforts, regularly attending each other's conferences and publishing in each other's journals and newsletters. In fact, EDUCOM held two conferences for computing humanist in the mid-1960s; the first, Computers for Humanists in December 1966 and the second, the Computer and Humanistic Studies in June 1967. Both were critically concerned with networks. However, the second was part of EDUCOM's "summer study" to discuss and plan the first national educational network—EDUNET. EDUNET was an attempt to further the "trends in on-line computing and educational television networks," but by bringing together "the

[212] Raben, Joseph. "Computer Applications to Problems in the Humanities: A Keynote Address," in *Proceedings: Computer Applications to Problems in the Humanities: A Conversation in the Disciplines, State University College, Brockport, N.Y. April 4-5, 1969*. (Brockport, State University of New York, College at Brockport, 1970) 19.

[213] Ibid.

quantity of machine-readable materials and other recourses [which are] mounting rapidly." It was an effort to connect already existing college and university computer systems across the nation so that they could share informational, educational and data processing resources. It would also potentially bring critical electronic recourses to those without. This "college net" as the *Christian Science Monitor* called it, would ultimately, "pool computer resources of institutions and communities and make those facilities available to schools which lack the resources to afford their own. The ultimate goal is to give EDUCOM participants immediate access."[214] Intellectually speaking, EDUNET was an outgrowth of INTREX. Robert M. Hayes, Professor of Library Science and Director of the Institute for Library Research at the University of California at Los Angeles, summarized the connection in *Computers and the Humanities* this way: "The potentials implicit in the MAC facility and the INTREX experiments at MIT were seen as the wave of the future. As a result, the work of that Task Force was directed at creating a computer network among universities, and the 'Summer Study on Information Networks' was regarded as a first step toward doing so."[215]

Humanists' participation in these types of conferences only compounded their interest in electronic textuality. Their participation not only allowed them to enter into discussion about the potential benefits of electronic educational networks in these years, but it also allowed them the further opportunity to think through and comment on the nature of electronic textuality in the presence of experts who were offering up farthest-reaching possibilities. Reporting on his participation at the EDUCOM "Summer Study on Information Networks," mentioned above,

[214] Cartmell, David. "College Net Planned," *The Christian Science Monitor* ( Jan 18, 1969). Pp. 15.

[215] Hays, Robert M. "Electronic Links to Knowledge. EDUNET: Report of the Summer Study on Information Networks," *Computers and the Humanities*, Vol. 3, No. 2 (Nov., 1968): 126-127.

Norman Holland, professor of English at the State University of New York at Buffalo, explained his critical take on the likelihood of real-time, on-line educational resources:

> A related possibility we discussed was the creation of an encyclopedia by the storage of immense amounts of data at various points around the country with consoles at a much greater number of points, consoles which would deliver anything from a once-over-lightly summary of a given subject to a full bibliography and print-outs of scholarly articles on one aspect. Such an encyclopedia would accept corrections and controversies as these came into it. It would thus be a truly McLuhanesque expression of our age. Unlike the compendia of the thirteenth or eighteenth centuries, it would have no physical location, no linear, sequential structure, no fixed content; it would be clumps of electrons hurrying from place to place, ordered not by any fixed structure of knowledge, but by the shifting needs and opinions of its users.[216]

**VI. Early Humanities Computing and the Social Responsibility of Bibliographic Control**

Bibliographic control was another area where humanists' interest in machine-readable textuality allowed them to get directly involved in technical solutions to information dissemination and retrieval. Like members of the electronics industry, library scientists and

[216] Holland, Norman. "Futures: A NonSummary of the EDUCOM Symposium on the Computer and Humanistic Studies," *Computers and the Humanities*, Vol. 2, No. 2 (Nov., 1967). Pp. 58.

others, computing humanists in the 1960s—that is, humanists who were invested in exploring the relationship between print and electronic textuality—were supremely concerned with the information explosion and the information management techniques and bibliographic control necessary to combat its social ills. "You're not unaware of the flood of information that is inundating us," Alyce Sands, assistant professor of English at Queens College and Coordinator the MLA's first Abstracting and Indexing system provoked her reading audience on the pages of *Computers and the Humanities*, "How do we deal with it? How can we provide what [Marshall] McLuhan calls 'civil defense against media fallout'?" Her answer was of course better bibliographic control. The system she described then in development was sponsored by the Modern Language Association but centralized and systematized "information about educational, organization, curriculum, methods, and materials"—the Educational Research Information Center. Today we know the system as ERIC. This system mimicked exactly, those systems set up for science and medicine described earlier—experts read abstracts of all papers published in their educational sub-field, produced lists of keywords for those papers and then those keywords were inputted into computers to produce automated indexes and allow for future searches. ERIC would become, and remains today, a massive resource for teachers and educators everywhere and it was sponsored and coordinated by a group of humanities scholars at the MLA.

Information management and bibliographic control was, in fact, a very early interest of computing humanists. The first humanities computing institute in the United States, the Institute for Computer Research in the Humanities at New York University was engaged in numerous efforts both at NYU and nationally to aid libraries, scholarly societies, museums and even the United Nations in the management of proliferating documentation and information. The ICRH's first foray into information management for outside groups was with the Gould Memorial

Library at NYU. In 1965, modifying a previously developed indexing program at the ICRH, they began a service to sort by subject matter all new acquisitions of the library and match them up with faculty at the university. "The system works as follows:" their newsletter reported, "as soon as a new book is received, a card is punched with the author, title, and call number (Library of Congress classification). Faculty lists are compiled, using the first two characters of the Library of Congress classification as a guide to the subject matter of the books in question… The faculty is enthusiastic about this new service."[217] After being approached by Carl Dauterman, Associate Curator of Western Decorative Arts at The Metropolitan Museum of Art, the ICRH began work in April of 1966 on a Museum Computer Network. This network for sixteen museums in New York was projected to sort, classify and store information on the holdings of each of the member museums. Three pilot projects with sample databanks were set up before ISRH lost its funding in 1968. Finally, the ICRH lent its services to the United Nations, for whom they wrote a program to index the minutes from the twenty-second General Assembly in four different languages. Members of the ICRH were also involved, as we've seen, in traditional concordance making and stylistic analysis of great humanities texts. But they were equally involved in bibliographic efforts in the world outside their fields and even outside academia. Computing humanists in the 1960s were interested in more than the extension of stylistic analysis (in particular, new criticism rigor) of canonical texts. They were concerned and engaged with the translation of the accumulating human record into electronic formats.

What's more, even beyond the straightforward bibliographic efforts of the MLA, ICRH and others, it was clear that for early computing humanists, the analysis of "literary data" itself

[217] "Computers aid in Library Information Dissemination," New York University ICRH Newsletter. Vol. 1, No. 3 (November 1965) pp. 3.

was part of the larger social and technical effort to turn all text into machine-readable and therefore more manageable data. Early computing humanists, even those engaged chiefly in computational analysis of humanities texts, felt they were a part of something much larger than just concordance making and stylistic analysis. In particular, they saw themselves and their hands-on experiments translating texts into computable data as part of larger efforts in information retrieval in these years. "They are part of the same revolution," Stephen Parrish argued in his opening statements at the Conference on the Use of Computers in Humanistic Research at Rutgers in December of1964. "The next large area of use for the computer in literary research lies in bibliography, enumerative bibliography. Here we are in the field known as information retrieval, IR," Parrish summarized.

In fact, over and over again, one heard at early humanities computing conferences a kind of hubris in this regard. So far, efforts in computerized information retrieval had been limited to basic, though speedy, sorting and classifying. Computing humanists were in the actual game of textual analysis—getting computers to identify complex textual elements—something that could supremely aid in the effort to get machines to collate and compare texts and thus get the information explosion under control. Humanities had something to provide here. More than anyone else, or so they thought, humanists were pushing at the edges of the quantitative-qualitative barrier in textual analysis—getting computers to recognize implicit features of texts. The traditional textual elements of interest in humanities analysis—for instance, meaning, context and style—meant they automatically entered into the discussion of natural language processing at a level once removed from mere keyword searching. Style, for instance was a topic of wide concern in early humanities computing literature—at conferences and in journals and newsletters. It involved the effort to get computers to fathom, on some level, linguistic

patterns which suggested authorial word choice, conscious or otherwise.[218] Experimentation along these lines revealed several options in these years: humanists used computers to count and analyze the juxtaposition, grouping and positioning of certain words; the use of word, phrase, clause and sentence types; word length; word derivation; punctuation patterns; and rhythm meter. Such methods of literary analysis could, some humanists thought, potentially aid in the overall effort to process natural language, a key area of information retrieval. Perhaps, for his reason, Sally Sedlow, professor of English and Computer Science at the University of North Carolina whose own work on "computational stylistics" led to work sponsored by the Office of Naval Research in 1967, felt that this subfield of "literary data processing" was the most fruitful intersection between literary criticism and technologists. "Computational Stylistics," she and her husband, Walter Sedlow, argued at the Literary Data Processing Conference held in September 1964, "is the result of a desire to give contemporary technology focused on language processing the benefit of analytical methods devised used by literary critics and, at the same time, to give literary critics the benefit of tools provided by contemporary technology—i.e., the large digital computer and new programming procedures." Others, including Parris agreed. Parrish himself felt that, "stylistic analysis" and information retrieval in particular was an intersection where humanists and scientists might truly come together. Having been present at Snow's famous 1959 Read Lecture, *The Two Cultures and the Scientific Revolution, Parrish* took every opportunity at early humanities computing conferences and in published articles to advocate for a recovery of the breach.

[218] In fact, computer analysis offered the opportunity, many argued, to get at "unconscious style" in ways previously not possible. In this case, in particular, computers allowed scholars to leverage literary and linguistic patterns, not straightforwardly perceptible to humans, to get "underneath" a text.

**VII. Toward the 1970s**

Humanists continued to be involved in the establishment of electronic networks and in bibliographic control in the years after these first forays. Indeed, these areas continued to be, as in these first years, profitable areas of interaction between humanists and technologists. But for humanists, the rhetoric of "engagement" disappeared rather quickly as they moved into the next decade. The 1970s were years of broad consolidation in humanities computing. The establishment of what continue till today to be the two central humanities computing organizations in the English speaking world—the Association for Literary and Linguistic Computing in 1973 and the Association for Computers and the Humanities in 1978.[219] These years also saw the beginning of the biennial Association for Literary and Linguistic Computing conferences in Europe and the International Conference on Computing in the Humanities in North America, in 1973 and 1974 respectively. Finally, endeavors to avoid duplication of effort in machine-readable texts also led to the creation of the Thesaurus Linguae Graecae in the United States (1972) and the Oxford Text Archive (1976) in these years. In the mid-1970s into the 1980s, talk about bibliography and machine-readable textuality in humanities computing settled much more into rhetoric of business as usual—advancing humanities research via text encoding and archiving. Compared to the mid-to-late 1960s, one encounters, in these years, far fewer expressions to the effect that guiding the uses of new information technologies is a direct way for the humanists to be serviceable to social ends outside the academy---that for instance, bibliographic control was a way for humanists to provide analytic-somatic health for their

[219] Today both organizations, along with the Société Pour L'étude des Médias Interactifs, are contained within the Alliance of Digital Humanities Organizations (ADHO).

students combating the ills of the information explosion or that the use of, and intervention in, computational processes was a way for interpretive scholars to help "humanize" computers in general. The 1960s were unique in this respect. Technologically, they were the period within which computational hardware and methodologies advanced to the point that humanists could get computers to deal directly with their fundamental unit of analysis—texts. Intellectually, they were a period of crisis in the humanities within which its practitioners felt an increased responsibility to be critically socially engaged. In the Unites States, as I've shown, the emergence of humanities computing occurred in reaction to both, at the intersection of these two impulses.

## Epilogue

## From Punch-Cards to Pixels: The Corporatization of Higher Education and the Socio-Technical Humanities Today

Today the socio-technical humanities are almost entirely contained within the digital humanities. The digital humanities are, of course, the larger set, also containing within it humanists and others interested only in the advantages of digital media and computing power for furthering research—to augment interpretive work in the humanities. But those who use new media and technology, and advocate for its uses, as a way for the humanities to become more deeply engaged in social and public matters, and in particular, those who argue that such engagements are a necessary way out of the contemporary crisis, now constitute a significant segment of the digital humanities. The socio-technical humanities are, in fact, alive and well in 2013. After a brief lull in the 1980s and1990s, during what I am calling the humanities "crisis of confidence," they have flourished in the last decade, responding with force to the terms of the current crisis—the "crisis of power." More and more the socio-technical humanities are gaining advocates and apologists; unlike other periods, I argue, today they are surrounded by fellow travelers. That is, more and more, the socio-technical humanities are thought to hold the key to solving the humanities' woes. In some ways, the current crisis in the humanities is theirs to solve; it is their moment to seize.

My periodization of crises in the humanities is meant merely to indicate the dominant ethos of each period. I do not mean to argue that the characteristic feature of each crisis excluded all others. Indeed, from WWII forward, the humanities have continuously found themselves trying to keep up with and connect to the sciences (crisis of the Two Cultures), to be more

socially engaged (crisis of engagement), to find internal coherence (crisis of confidence) and to acquire the power necessary to survive in an increasingly instrumental world of higher education (crisis of power). In fact, in some ways, the crises in the humanities from WWII forward, are cumulative, and as such my moniker for each period is meant to indicate what has been added to it with each period. For instance, the two cultures debate is still with us, as is the feeling that the humanities remain critically disengaged from real world issues.

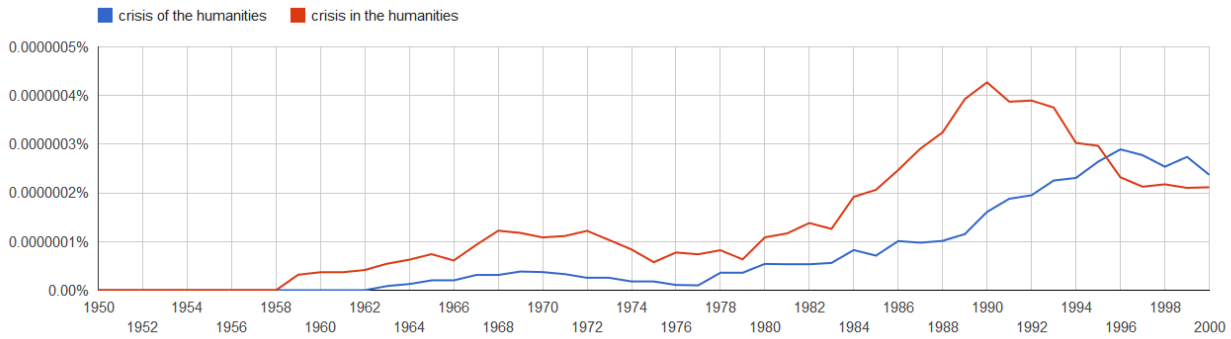



**Figure E.1.**

In the 1980s, there was added to both these sentiments a massively escalated crisis of confidence. The 1980s and 1990s, can in fact, be seen, in some ways, as the nadir of the humanities crisis. If the late 1950s and 1960s is the period in which the phrase "crisis in the humanities" first gained widespread traction, the 1980s is the period in which the terms' use truly accelerated (figure 1). The first sign of escalating trouble was declining enrollments. Between 1966 and 1993, the percentage of bachelor's degrees awarded in the humanities dropped from 20.7 to 12.7, and the percentage of doctoral degrees awarded in the humanities fell from 13.8 to 9.1. The decline in bachelor's degrees throughout the 1970s and in to the mid-1980s was drastic indeed, a near free fall, and it struck humanities educators everywhere with total dismay. Added

to this was a problem of outright conflict as politicians, cultural commentators, alumni and influential humanists themselves expounded on the rapid decline by lashing out against what was perceived to be a leftist-leaning, obtusely theory-laden humanities

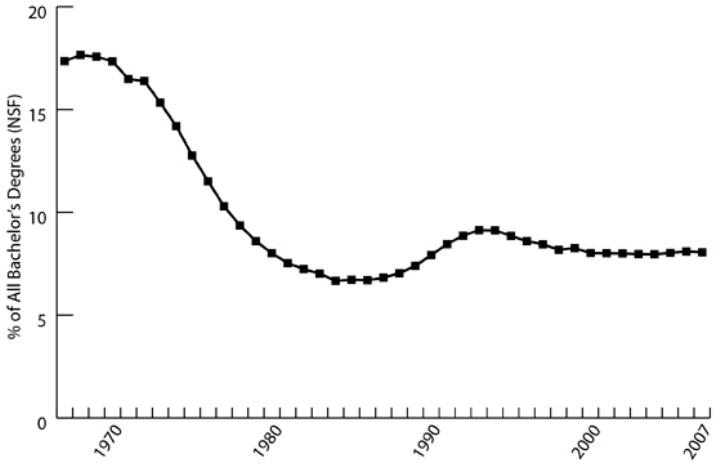


Figure E.1

enterprise. "It may well be the case that the much-publicized decline in in humanities enrollments recently is due at least in part to students' refusal to devote their college education to a program of study that has nothing to offer them but ideological posturing, pop culture, and hermeneutic word games," Roger Kimball wrote in his 1990 *Tenured Radicals*.[220] The rise of feminist criticism, African American studies, gay and lesbian studies, as well as a new focus on language, objectivity and interpretation in the humanities was, according to some, a major misstep away from the fundamental aim of humanities education—to "save the soul and enlarge the mind," as William Bennett put it in his 1983 piece, "The Shattered Humanities."[221] A return to a humanities centered on an engagement with tradition, with the authority of canonical texts, was counseled by Roger Kimball, and among others, Allan Bloom in his widely influential, *The Closing of the America Mind* and William Bennett, chairman of the National Endowment for the Humanities from 1981-1985. While many took the claims of Kimball, Bennett, Bloom, and others to be unfounded, by the time of the 1997 edited anthology, *What's Happened to the*

[220] Kimball, Roger. *Tenured Radicals: How Politics Has Corrupted Higher Education*. (New York: Harper & Row, 1990); 11.

[221] Bennett, William. "The Shattered Humanities," *American Association of Higher Education Bulletin* (February, 1983); 3.

*Humanities?*, generally considered a low water mark in humanities confidence, a good number of humanists were willing to admit that something had gone drastically wrong in the prior two decades.

Compared to the 1950s, 1960s and today, there was less talk during this period of using new media and technology as a way out of the contemporary crisis in the humanities. This is not to say that humanists were not using new media and technology in these years. Indeed, humanities computing, text encoding and the use of educational technology, especially with the arrival of the personal computer, occurred everywhere in these years. But these endeavors were rarely accompanied by a rhetoric of humanities-oriented, socio-technical interventionism. Again, this is not to say that one cannot find such rhetoric. "The existing and emerging technologies that have ushered in the electronic learning age will not pass away or magically disappear," Suzanne E. Lindenau, director of foreign-language laboratories at the University of Georgia wrote in the in 1984, "Instead, they could enable us in foreign language education, the humanities, and the arts to shift out of reverse, improve the quality of education, and effectively educate Americans for the twenty-first century."[222] But one finds startling little of it in these years, especially compared to the periods prior and subsequent to it. Unlike the 1950s and 1960s, it just wasn't a climate of crisis within which the socio-technical humanities' rhetoric of social engagement via new media and technology could gain as much traction. The crisis of confidence was simply not the kind of crisis appropriately dealt with via experimentation with media, or rather it was not the kind of crisis whose features could be as easily mobilized while arguing for the needed social engagement of the humanities via technological interventionism.

[222] Lindenau, Suzanne E. "The Teacher and Technology in the Humanities and Arts," *The Modern Language*

*Journal* (Summer 1984); 119-120.

Of course, the crisis of confidence, though somewhat reduced, is still with us. One still encounters statements to the effect that the humanities are at this moment completely lost at sea. The humanities, Lynn Hunt, argued in typical fashion in 2008, are in an "interpretive cul-de-sac." "It is time for a new paradigm … for humanistic studies more generally," she declared.[223] For as long as we can remember, the humanities have bemoaned their lack of influence and power. The humanities have always, according to its contemporary practitioners, been on the decline. The halcyon days of prestige, confidence, coherence and authority have always been behind those assessing the status of the humanities in the modern world. When higher education was opened up to the masses, scholars like Douglas Bush, lamented the incursion onto campus of those who had always displayed an open disinterest, even disgust, for the humanities. Even as humanities majors were on the rise in the 1960s, humanists lamented a general techno-scientific turn away from the past and away from humanities interests.

But in the last decade an actual loss of power in the realm of higher education has begun to register among humanists greatest fears: in the last decade, *this* has become the focus of much of the crisis in the humanities literature, a literature which now verges on a cottage industry. The outpouring of books on the situation, is itself, now cited as an indication of the scope of the dilemma. A kind of feedback loop has been installed. "Higher education is in big trouble," Ellen Schrecker wrote in reviewing for the Bulletin of the American Association of University Professors, "Otherwise, why would so many energetic, intelligent, and concerned academics desert their traditional disciplinary pursuits to publish jeremiads about the pitiful state of the humanities and the institutions that purvey them? A recent review article in The Nation surveyed

[223] Hunt, Lynn. "The Experience of Revolution," *French Historical Studies* (Fall 2009); 671.

ten such volumes; this review deals with five, mainly different, ones; and literally dozens more are available on Amazon."[224]

Whether the latest developments in the loss of power for humanists can or should be seen as a difference in degree or kind, commentators today point to a number of defining factors for the contemporary situation. Actual departments are being shut down. Not many in reality; but when they are, waves of near-hysteria spread across academia. When SUNY Albany closed its French, Italian, Russian and classics programs and departments in 2008, leaving ten tenured and twenty tenure track professors in the lurch, the signal was loud and clear. The increasingly instrumental climate in higher education, plus the sudden finical situation (especially with state-funded higher education) dictated the terms of the new regime: enrollment is everything. Everyone knew the time would come when the financial feasibility of departments and programs, not their overall role in the transmission of our collective human heritage, would matter most. George M. Philip, president of SUNY Albany, put the terms quite starkly in defending the decision: there were "comparatively" fewer students enrolled in these programs. But of course, the loss of those seats is more an indication of an overall sea change—those seats are no longer filled because requirements have changed. Declaring that "The Crisis of the Humanities [has] Officially Arrive[d]," Stanley Fish wrote of the decision: "If your criteria are productivity, efficiency and consumer satisfaction it makes perfect sense to withdraw funds and material support from the humanities — which do not earn their keep."[225]

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[224] Schrecker, Ellen. "The Humanities on Life Support," *Bulletin of the American Association of University Professors* (September-October, 2011). Accessed online: http://www.aaup.org/article/humanities-life-support#.UgVVRG02yt4

[225] Fish, Stanley. "The Crisis of the Humanities Officially Arrives," New York Times (Oct. 10, 2010). Accessed Online: http://opinionator.blogs.nytimes.com/2010/10/11/the-crisis-of-the-humanities-officially-arrives/?_r=0

The status of tenure is another rallying point. Though a problem for faculty in all fields, the humanities are, as one can imagine, singled out as particularly vulnerable in the contemporary crisis literature. Some have argued that the erosion of tenure—today, only 31 percent of college teachers are tenure or tenure track, down from 57 percent in 1975—is part of a silent and subversive strategy from the 1980s forward to take power away from would-be "tenured radicals," especially in the humanities. Gregory Jay, professor of English at the University of Wisconsin, Milwaukee, puts it perhaps most ironically in reviewing and summing up the arguments of Frank Donoghue's *The Last Professors: The Corporate University and the Fate of the Humanities* and Christopher Newfield's *Unmaking the Public University: The Forty-Year Assault on the Middle Class:*

> [From the 1970s to the 1990s] hot disagreements over feminism, poststructuralism, political correctness, multiculturalism, identity politics, postcolonialism, border and queer studies (to name a few) dominated the headlines and monographs. Meanwhile, and with much less fanfare, a revolution was occurring in campus budgets, management, and the structure of academic labor, resulting in changes that may have far more lasting effects than any of the innovations in scholarship… the switch to non–tenure track academic labor is not an end in itself, but one instrument in a larger effort to undermine the progressive social development and egalitarian ideals of higher education in a democratic society.[226]

[226] Jay, Gregpry."Hire Ed! Deconstructing the Crises in Academe." American Quarterly, vol. 63, no. 1 (2011): 163-4.

Even the unprecedented increases in tuition in recent years—a forty-two percent increase from 2000-2010 (after adjustment for inflation) for public colleges and universities and thirty-one percent for private—are seen as a death knell for the humanities.[227] "In the 1990s students were prepared to borrow more as a hedge on future incomes, but this model of financing higher education now seems obsolete as fees have continued to rise while future incomes have stagnated," Colleen Lye and James Vernon wrote in the February/March 2011 Newsletter for the Doreen B. Townsend Center for the Humanities.[228] "When the job market worsens, many students figure they can't indulge in an English or a history major," David Brooks wrote in a 2010 New York Times article, an article widely cited and commented on in the crisis literature.[229] But the results are a little more complex. As the economy falters, students don't just seek out more practical degrees at the same campuses as before. They also seek out, more and more, strictly vocational degrees from for-profit higher educational institutions, institutions which explicitly marginalize humanities courses. They also seek out the cheapest educational providers and degrees, meaning, often, online degrees, of which the humanities offer few. Much of this is why for-profit higher education has become such a boon in recent years. In 1960s there were a handful of for-profit postsecondary institutions; by 2003 there were 2,383 accredited for-profit colleges and universities—a full one third of all two and four-year institutions of higher

[227] U.S. Department of Education, National Center for Education Statistics. (2012). *Digest of Education Statistics, 2011.* Accessed online: http://nces.ed.gov/fastfacts/display.asp?id=76

[228] Vernon James, Colleen Lye. "The Humanities and the Crisis of the Public University," *Newsletter for the Doreen B. Townsend Center for the Humanities* (February/March 2011). Accessed online: http://townsendcenter.berkeley.edu/publications/humanities-and-crisis-public-university.

[229] Brooks, David. "History for Dollars," (*New York Times*, June 7, 2010). Accessed online: http://www.nytimes.com/2010/06/08/opinion/08brooks.html

education in the United States. Their flagship, is in some ways, the University of Phoenix. Founded in 1976, it has the largest enrollment of any American university: over 400,000 undergraduate and 78,000 graduate students. Phoenix offers associate, bachelor's, master's, and doctoral degrees in more than 100 subjects. Of its 20,000 faculty members, most are part timers, receive no benefits, and have no access to tenure. The fate of the humanities in the flourishing world of for-profit higher education is easy for many to predict. "This is a corporation," John Sperling the president of the Apollo Group (The University of Phoenix's parent company) has argued, aggressively pitting the instrumental value of his brand of education against the humanities directly, "Coming here is not a rite of passage. We are not trying to develop [student's] value systems or go in for that 'expand their minds bullshit.'"[230]

An increased focus on the instrumental impact of teaching and research, the undermining of tenure, rising tuition, the massive growth of online and for-profit education; none of these are taken in isolation in the contemporary crisis literature. Instead they are thought, by those commenting on the decline of the humanities on campuses today, as part of an overall corporate redesign of higher education—a redesign in which the humanities are losing clout and control as never before. What the humanities face today most vitally, according to these commenters, is the "corporate university," or even a "corporate attack on the humanities."[231] "The result," according to Ellen Schrecker, in "The Humanities on Life Support," is an "increasingly competitive system

[230] Cox, Ana Marie. "None of Your Business: The Rise of the University of Phoenix and For-Profit Education—and Why It Will Fail Us All," in *Steal this University: The Rise of the Corporate University and the Academic Labor Movement.* Eds. Benjamin Johnson et al. (New York: Routlage, 2003); 19.

[231] Donoghue, Frank. *The Last Professors: The Corporate University and the Fate of the Humanities* (New York: Fordam University Press: 2008). Fettner, Peter. "The Crisis in the Humanities and the Corporate Attack on the University." Accessed Online: http://www.academia.edu/875988/The_Crisis_in_the_Humanities_and_the_Corporate_Attack_on_the_University

of higher education permeated by the corporate values and inequities that pervade the rest of American society."[232]

If one reads the full breadth of this contemporary crisis literature—the numerous books that have come out just since 2000, the articles, conference proceedings, blogs and near endless online commentary—there is a sense, at times articulated, at other times tacit, that the humanities main deficit in all of this has been their *inability to sell themselves*, to demonstrate their specific value or usefulness to the public. It registers both as embarrassment and as guilt. This feeling has always been around—indeed, the humanities have always been a tough sell. But this undercurrent of feeling is more palpable than ever before. Thus, it's no wonder that in this climate more and more educators, humanist and others, have begun to argue for the practical, instrumental benefits of the humanities. In just a few short years, for instance, programs specifically built for instrumental humanities undergraduate and graduate work have appeared on the academic scene. The Brigham Young University Humanities+ program, started in 2010, advertises its goal as "Bridging the Humanities and the World of Work." Students in this program are encouraged to minor in a professional field and to participate in overseas internships. "In our globalized marketplace, many recruiters are turning directly to humanities majors for their foreign-language and intercultural expertise," their mission statement reads, "their leadership abilities, communication skills and above all for their intellectual flexibility and creativity." Likewise, at the graduate level, the Master of the Arts Program in the Humanities at the University of Chicago, established in the late 1990s, states its mission as "Bringing Humanities into the World." Their website boasts a number of graduates, called "MAPHers," who have found jobs in media, marketing, policy analysis and an 02' graduate who became a

[232] Schrecker, Ellen. Ibid.

finance director for the Obama 2008 campaign. “The Master of the Arts Program in the Humanities is a model for a more pragmatic kind of graduate education,” the programs showcases an endorsement by a rather traditional humanities figure, Elaine Showalter, “This seems like absolutely the right direction. What's original and incredibly timely is the combination of an intensive, unwatered-down academic program with an introduction to a wider professional context.”

Many other humanities divisions, programs or departments not explicitly dedicated to an instrumental interpretation of humanities pedagogy have nonetheless begun to tout the value of humanities skills in the marketplace by citing endorsements from successful entrepreneurs. “I think maybe the best education, or the best foundation for business is probably reading Shakespeare, rather than reading some MBA program out of some great business school. I think I'd rather have an English major than an economics major,” Michael Eisner, CEO of Walt Disney, and an English and Theater major, is quoted on the University of the Pacific’s humanities division website, titled “Value of the Humanities in the Marketplace. “The most valuable class I took at Stanford was not Econ 51. It was a graduate seminar called, believe it or not, ‘Christian, Islamic and Jewish Political Philosophies of the Middle Ages.’” Carly Fiorina, former CEO of Hewlett Packer and a major in philosophy and medieval history is quoted on the College of New Jersey’s Liberal Arts page, “the rigor of the distillation process, the exercise of refinement …I've used it again and again.” Steve Jobs is cited everywhere: “The reason that Apple is able to create products like iPad is because we always try to be at the intersection of technology and liberal arts, to be able to get the best of both." The humanities are learning to sell themselves in the new climate.

Indeed, there is, it seems, a movement afoot, if only rhetorical, between business and the humanities. For those keeping abreast, in the last month alone (July 2013) there have been articles in the *Harvard Business Review*, "Want Innovative Thinking? Hire from the Humanities;" in *Forbes*, "The Difference Humanities Makes In Business," in *Business Insider*, "11 Reasons To Ignore The Haters And Major In The Humanities," and *CNN Money*, "Why the humanities need to be saved," with many, many more in the months preceding. When industry leaders of late champion the advantages of humanities degrees in the marketplace, new blogs devoted to the intersection of the humanities and marketplace light up. BYU's Humanities+ blog and Union College's blog, "The Arts and Humanities in the 21st Century Workplace," for instance, work as clearing houses for articles and reports on these issues. When Christian Madsbjerg and Mikkel B. Rasmussen, both senior partners at ReD Associates, recently wrote an article in the *Washington Post* titled "We need more humanities majors," or when a 2012 report from *Business Insider* listed thirty "extremely successful" business leaders and public figures with humanities degrees, the stories get re-broadcast again and again by departments and blogs trying to revitalize the humanities.[233]

While activity of this kind seems to be taking place more at smaller colleges and universities, who, like community and state colleges, find themselves today caught at a crossroads between vocational and elite models of higher education, it is definitely not limited to institutions located at lower tiers. Stanford recently enacted a number of initiatives designed to highlight the practical benefits of humanities majors including hosting an American Academy of

[233]Madsbjerg, Christian and Mikkel B. Rasmussen. "We need more humanities majors." Washinton Post (July 30, 2013). Accessed online: http://www.washingtonpost.com/blogs/innovations/wp/2013/07/30/we-need-more-humanities-majors/ Cutrone, Carolyn and Max Nisen. "30 People With 'Soft' College Majors Who Became Extremely Successful," *Business Insider* (Dec. 18, 2012). Accessed online: http://www.businessinsider.com/successful-liberal-arts-majors-2012-12?op=1#ixzz2bzdAdJGF

Arts and Sciences conference on the humanities and international relations, cultural diplomacy, leadership and American competitiveness. The first thing they did was try to sell this new emphasis to their alumni. “Stanford can’t ignore the pressures of a wider national context in which students make their choices,” explains an article in their Alumni Magazine, titled “Who Needs the Humanities at 'Start-Up U'?” “In this era of anxiety about graduates finding jobs, the humanities are the subject of an intense debate about relevance and value. In short, humanities majors are suspected of having no “real” or marketable skills, “ the article goes on, “The response of Stanford philosophers, historians and literary scholars has been to saddle up and ride into the fray. The University has launched a number of initiatives to highlight what the humanities offer in both pragmatic and inspirational ways, to strengthen the preparation they provide for careers beyond academia.”

At the graduate level, Anaïs Saint-Jude, established and now directs Stanford’s BiblioTech Program whose slogan reads: “Bibliotech: Connecting Liberal Arts PhDs with Forward-Thinking Companies.” Bibliotech reaches out to local technology firms setting up “designships” with humanities Ph.Ds. or graduate students, or as the program calls them, “humanities professionals.” The program also sponsors conferences, talks and what are essentially mixers between Stanford humanities Ph.Ds. and members of the tech industry. Humanities Ph.Ds., they continue the contemporary refrain, hold the essence of innovation: the ability to communicate well, to be “comfortable with ambiguity,” and to puzzle through novel problems in imaginative ways. “That's 500 of some of the country's most intellectually curious thinkers,” their website markets Stanford’s humanities doctoral students to industry, “waiting to meet you, identify your next challenges, and design creative solutions for tomorrow, today.” Bibliotech was also behind the well-known 2011 two day conference, “Bringing Humanities

Ph.D. Innovation to Silicon Valley," which brought 120 students, faculty and industry leaders together to discuss ways of getting humanities Ph.Ds. into Silicon Valley. It was here that Google's Damon Horowitz gave his much talked about keynote address, "Why you should quit your technology job and get a Ph.D. in the humanities," and where Melissa Mayer, vice-president of consumer products at Google, made an announcement that riveted the academic world for a brief period: the technology giant would hire 6,000 people in 2012; of those, 4,000 - 5,000 would "probably" be humanities Ph.Ds.

Scholars, commentators and members of industry plugging the instrumental value of the humanities in the marketplace today regularly find themselves endorsing the socio-technical humanities. In the current crisis of power—that is, with the perceived threat of the corporatization of higher education, and its projected effects on the humanities—commentators endorsing the market value of technology-oriented humanities skills have become the socio-technical humanities greatest outside advocates. They are now legion. And once again, the terms of the contemporary crisis in the humanities have dictated the terms of their endorsement. For the fellow travelers of the socio-technical humanities today, the argument for humanists' engagement with new media and technology takes on a more instrumental justification than it did in the 1950s and 1960s. It's less about guiding the uses of new media and technology than it is about increasing the competitiveness of humanities programs by thinking about the ways that they can provide marketable skills. The socio-technical humanities have always had fellow travelers. But in the 1960s, they often came from an expanding group of humanists who hoped that scholars would in some way participate in the wider technology assessment movement of the decade—they were advocates for a social mission of the humanities. Take Herbert Muller, Professor of English at Indiana University, for example. Muller was a typical fellow traveler of

the socio-technical humanities in the 1960s, during the humanities crisis of engagement. In 1970, he wrote a piece for the *American Scholar* in which he relayed an experience one finds repeated again and again in the 1960s literature on the relevance of the humanities.

> In a recent seminar in political philosophy, centered on the issues of democracy, I started for the sake of historical perspective with some study of freedom in the ancient world - a major item in my professional stock in trade. One day an impatient student suddenly launched a harangue on the terrific problems looming up, such as the population explosion, the prospects that millions of people are going to starve to death; and here we were way back in ancient Greece, reading Plato's Republic.[234]

Muller dropped a rehearsed line for the student: one needs a longer perspective before assessing the contemporary situation. But the line, and the sentiment behind it, was too easy a routine for Muller who, having written *The Children of Frankenstein: A Primer on Modern Technology and Human Values*, was deeply concerned with the critical features of the contemporary world. "Are the perspectives got from the political thought of the little Greek polis," he confronted himself, "really of much help in understanding our massive technological society?"[235] Muller's solution was engagement. Without forsaking a fidelity to the past, humanists must, in order to be "involved" or "committed," become obliged to critique the future, and for Muller, that meant more humanities-oriented technology assessment: "What do teachers of the humanities have to

[234] Muller, Herbert. "The 'Relevance' of the 'Humanities.'" *The American Scholar* (Winter, 1970-71); 111-112.

[235] Ibid. 112.

contribute to such enterprises? Although not qualified as forecasters, they at least have something to say about the most important consideration, the question of what America ought to do with its fabulous technology. They can promote criticism of the actual uses of this technology."[236]

Today, by contrast, the dominant argument for the socio-technical humanities on offer from its fellow travelers is much more instrumental. "[There is a] range of useful professional competencies with which a humanities education equips 21st-century students," Paul Jay and Gerald Graff argued in a much commented on piece in Inside Higher Education, "The Fear of Being useful." "In addition to learning to read carefully and to write concisely, humanities students are trained in fields like rhetoric and composition, literary criticism and critical theory, philosophy, history, and theology to analyze and make arguments in imaginative ways, to confront ambiguity, and to reflect skeptically about received truths, skills that are increasingly sought for in upper management positions in today's information-based economy."[237] Sounds familiar; it's the same reasoning so widely on offer these years. But like many others today, they then move directly from advocacy of the instrumental utility of humanities skills to an endorsement of the digital humanities. "The concrete value of the humanities education [that people in industry] celebrate is especially well epitomized in the new field of the digital humanities," Jay and Graff go on to argue, "Students in the digital humanities are trained [for instance] to deal with concrete issues related to intellectual property and privacy, and with questions related to public access and methods of text preservation….We believe it is time to

[236] Ibid. 117.

[237] Jay, Paul and Geralg Graff. "Fear of Being Useful," *Inside Higher Education*. (Jan. 5, 2012). Accessed online: http://www.insidehighered.com/views/2012/01/05/essay-new-approach-defend-value-humanities

stop the ritualized lamentation over the crisis in the humanities and get on with the task of making them relevant in the 21st century."

A good many of today's socio-technical humanists have also taken a more directly instrumental defense of their endeavors. This is especially true of what is perhaps the dominant impulse in the socio-technical humanities today, what I would call "data-intensive humanities." In the current climate, they cannot, in some ways, help but sell themselves as uniquely capable of imparting much needed technical savvy to their students (e.g. programming and database management), of attracting much needed funding from corporate, non-profit, and governmental agencies in a time of humanities defunding and, in general, of making humanities research, often based on large datasets, more fathomable to academic administrators, policy makers and the public. Take the Google offer as an example. Despite the media attention, Google never gave much of an explanation—why would 80% of its hires in the next year come from the humanities? Dig as one might, there was not much to find. Mayers mentioned that understanding human behavior was fundamental to developing user interfaces and that Google Doodles were often cultural in content. That was about it. But someone else at the 2011 Bibliotech conference, not speaking directly to Google's proposed hires, did explain the link. Bob Tinker, president and CEO of MobilIron, in a panel discussion on "Silicon Valley Entry Points for Humanities Ph.D.s: Google," encapsulated one of the fundamental contemporary connections between the humanities and the technology industry this way: "Technology is becoming more humanist and at the same time the humanities are becoming more technical." Big data provides perhaps the best example here. Meaning making is not just taking place at an exponentially expanding scale via posts, tweets, blogging, memes and image uploads online. We are online in other ways too—and meaning is becoming increasingly important here as well. Corporations interested in the

power of big data, especially it's social and cultural variants, are beginning to explore the degree to which traditional humanistic modes of interpretation can help power its analysis. As vast amounts of data coming in about what people do, companies like Google, Apple, IBM and others have become newly invested in making their technologies responsive to the individual user's experiences in innovative ways. This requires more than just empirical pattern-recognition; where has the wearer of Google Glasses gone before? Do they usually go to Starbucks before they go to the mall? Do they tweet or post about frustrating situations two weeks before they buy a vacation package or three? To be truly responsive to the individual human experience, these firms will have to start taking into account meaning, value and significance in regards to the decisions users make and the experiences they have. People trained to ask and answer questions about why people do what they do and how they feel about what they do will be needed to truly harness the power of big data to make technologies responsive to users' individual experiences.

At the same time that these companies hope to move beyond social-scientific pattern recognition in their datasets of human activity, digital humanists themselves are starting to look at meaning on a large scale. As more and more of the human record is born within, or converted to digital formats, the large-scale longitudinal analysis of material traditionally examined by way of intimate scholarly study has become both more feasible and more appealing. Humanists currently skirting the line between large scale analysis of sizable data sets and traditional modes of close reading, interpretation and meaning—the "data-intensive humanities"—are attractive to industry for just these reasons. In some ways, the two groups—industry and data-intensive humanities—are meeting in the middle, where large-scale datasets of human activity and the large-scale analysis of human meaning come together.

Ultimately the instrumental climate of higher education in which data-intensive humanists find themselves responding today, combined with the new interests of industry in their skills, has led many to be equally, if not more, concerned with saving technology than with saving the humanities; or rather, has led them to believe that saving the former will automatically save the latter. This is not to say that data-intensive humanists do not advocate for the humanities; they are after all, as I've defined them, part of the socio-technical humanities. They argue that the humanities are relevant and essential in direct response to the specific features of the current humanities crisis. But given the current climate, they tend to advocate for the humanities only by way of advocating for innovative digital breakthroughs in humanities research. Part of the problem is this. The legions of socio-technical humanities fellow travelers today—CEOs, tech columnists, high level academic administrators, leading industry spokesmen—make it appear as though all humanists have to do is link their work up with new socially oriented information technologies or with sizable data, train their students to do the same, and the humanities will automatically be saved. Doing so will, in the short term, guarantee their students jobs, and in the long term, transform the humanities into something—large-scale data-based interpretive fields—that administrators, deans, funding agencies and the public "gets." Their social engagement with technology today is not, as in the days of socio-technical humanists' emergence, always hitched to a direct and robust humanities advocacy. In this way, they could learn a lesson from their 1950s and 1960s counterparts—those original electronic humanists who emerged out of an impulse to engage new media *only* as the product of the much stronger impulse to shore up the humanities and to make them relevant again. The socio-technical humanities, as I've defined them, have always flirted with this fine line—between an instrumental interest in cutting-edge technology itself and in keeping an eye on what's best for

the humanities. Today they run the risk of thinking that because the two are, in some arenas, now so indelibly linked up together that saving the former will automatically save the latter. But even in an era when many industry leaders are convinced that humanists have something to add to technology, only outright, vigorous humanities advocacy will save us.

There is another main, if unnamed, current in the socio-technical humanities today, what I am calling the "immersive humanities." My contention is that they have within their foci the kind of inherent humanities advocacy perhaps necessary for our fields to survive the early 21st century. The immersive humanities, as I'm defining them, embrace the innovative use of new media because they recognize the fundamentally and uniquely immersive quality of humanities interpretation and argumentation—that is, they recognize that because the content of humanities teaching and scholarly argumentation are so often experiential, narrative, affective and contextual in nature that they seek to explore the ways in which those inherent features can be enhanced through the use of electronic and digital media.

The immersive humanities have both a pedagogical and a scholarly component. Pedagogically, they aver a commitment to digitally-enabled, integrative and immersive learning in the humanities. The immersive humanities include those trying to find a way to negotiate between the practices of close reading and the demands of the new digital world, between the established mode of textual engagement in humanities education and a world of sensory and information overload. "Hyper-reading" is, year by year, becoming more common place for the born-digital generation; correspondingly, close, print-based, textual analysis is falling further and further outside their zone of proximal development. As humanities instructors, immersive humanist feel certain they must find a way to negotiate between the two—to admit that large-scale social forces are changing the way people engage culture and information, and remain vital

by helping to instill critical interpretative skills for these new modes of media engagement. In short, the immersive humanities attempts to help guide the new cultural and informational practices of the digital age *and at the same time* remain true to the traditional and perennially important aim of humanities instruction—to teach the measured, contemplative and reflective engagement of cultural objects. The immersive humanities have in just the last ten years become deeply committed to intervening in the social nature of new media and technology. After all, the media revolution of the past decade, even half decade, is fundamentally different than those previously dealt with by socio-technical humanists. The participatory nature of the web today has made digital humanists see themselves as uniquely capable of intervening in "newly emergent public spheres"—that is, online collaborative spaces.[238] For many, if not most people of the world today, the internet has become the chief realm where they engage in meaning making, in employing both representational and interpretive strategies—the core focus of humanities instruction—and immersive humanists seek to guide such practices.

In its scholarly guise, the immersive humanities aver a commitment to the multi-modal publishing of works that function in an interpretive mode. That is, the immersive humanities seek to explore the vital connection between the unique modes of reasoning and claim making in the humanities and the inherently immersive character of digital media. Humanists often argue by invoking their overall experience with materials; a lifetime spent reading the works of a single author or years spent scrutinizing select archival collections. If we could just completely immerse the reader in the works of James Joyce, or in the political discourse of the 1890s, we seem to think, we could show the reader more clearly what we mean. Digital technology allows

[238] *UCLA* The *Digital Humanities Manifesto* 2.0. Accessed Online: http://www.humanitiesblast.com/manifesto/Manifesto_V2.pdf

for such possibilities, where the reader has the means to immerse themselves in the discursive material which truly sustains an argument and the freedom to individually explore the separate, but related, narratives that often constitute the argument of an interpretive work overall.

Given their pedagogical and scholarly modes, the immersive humanities, I'm arguing, take on a number of social responsibilities that data-intensive humanities typically do not. Given their foci, their practitioners often take as central to their mission in engaging digital technology the responsibility to help students critically engage an immersive, multisensory world of rapid, digital-media-driven social change; to explore the relationship between new media and traditional print culture and to work toward new forms of digital literacy; to intervene in the increasingly automated structure and networked transmission of knowledge; to preserve human values in a world of automated, self-regulating electronic information systems; and to help students critically engage the specific formal aspects inherent in various digital media, and in so doing, resist the contemporary impulse to view all digital media as *information* delivery systems without specific formal languages.

The distinction between data-intensive humanities and immersive humanities is not meant to be exhaustive. Nor is it meant to be mutually exclusive. Indeed, there is plenty of overlap. I am not dividing up people—that is, practitioners in the socio-technical humanities—but rather impulses, either of which any individual may advocate or explore at different times. What's more, the data-intensive humanities are already well known, and their potential complicity in the overall instrumentalization of higher education well argued. The terms of the current crisis has, as I've shown, elicited very specific responses from the socio-technical

humanities. Indeed, as in every period, starting with their emergence in the 1950s and 1960s, the terms of the contemporary crisis has shaped their core rhetoric and molded their hopes and expectations—it has dictated their essential character. Today's crisis of power combined with the unique features of digital technology has, as I see it, produced two leading impulses—the data-intensive humanities and immersive humanities—the former, rather well identified, the latter, not. Thus, it is the immersive humanities that I want to single out here. It is the immersive humanities, I'm arguing, that is first, a coherent and unified (if unconsciously so) impulse in the socio-technical humanities today, second, that is has a rich, though as yet unidentified legacy starting from the 1950s and 1960s on which to draw, and third, that it is the kind of impulse which, because it blends the most essential and time-honored values, aims and aspirations of humanities research and instruction with the immersive qualities of digital technology, is better suited to act as the kind of direct, robust and digital-oriented, humanities advocacy we need in the current crisis.

## Conclusion

Throughout this dissertation I have argued for and established two sets of theses: the first regarding the periodization of the humanities crisis in the post-WWII era and the second concerning the emergence, in the 1950s and 1960s, of what I have called the socio-technical humanities. First, I have shown the degree to which the post-WWII crises in the humanities has changed its focus and features over time as the humanities have responded to social, cultural, economic and technical developments both inside and outside academia. Within each crisis, as I have shown, there existed a core set of perceived threats for the humanities, some shared with other periods, others unique to the era under consideration. The early 1950s to early 1960s constituted what I have called the "crisis of the two cultures," invoking the title of C. P. Snow's famous 1959 Read lecture, "the Two Cultures." On the one hand, humanists felt increasingly marginalized in an era of "big Science"—of nuclear energy and nuclear weapons, of rocketry and radar, and of computers and cybernetic machinery; an era when 'science' itself, and not for instance the works of artists or philosophers, was continuously referred to as "man's greatest achievement;" an era when *Time Magazine* declared "The Scientist" the man of the year, and the "the leaders of mankind's greatest inquiry into the mysteries of ... life itself;" an era when scientists for the first time became permanent advisors to the congress and the Whitehouse; an era, in short, when science attained a new levels of intellectual, and even cultural, authority . On the other hand, humanists felt additionally threated by the increased focus on, and funding for, vocational degrees in higher education. Finally, the nature of mass higher education made each of these problems worse. The G.I. bill specifically, and the newly inclusive nature of higher education in general, brought onto campus a new class of student, one generally unresponsive to literature and the arts and often interested chiefly in the benefits of professional training.

The social unrest of the mid-1960s to early 1970s then changed the conditions of the ongoing humanities crisis. Within this period, which I have called the "crisis of engagement," widespread social disruption outside the academy, exemplified most by urban unrest, the Vietnam War, assassinations of major public figures and an extensive student rebellion made manifest a total disconnect between the traditional subject matter of the humanities—especially it's mid-century, analytic, formalistic and positivistic variants—and the rest of life. Why, students wanted to know, were they reading Chaucer, or worse, Rudolf Carnap's reduction of all language to formal logical syntax, when blood ran in the streets. Why, students wanted to know—students who, in the 1960s, came to the humanities in record numbers for answers to fundamental human questions—was there such a wide discontent between what they engaged in the classroom and what they saw outside that classroom. Within this period, humanists' disconnect from real world issues generally, and from student's direct experience of the modern world, in particular, eclipsed, but also in some ways merged with earlier concerns regarding their alienation from science and technology. During the "crisis of engagement," the threat that science and technology posed for the relevancy of the humanities during the "crisis of the Two Cultures" combined with the accusation that humanists were generally socially disengaged and thus found scholars everywhere clamoring for humanistic council on science and technology.

Into these crisis stepped the socio-technical humanities. For underneath and behind all the various features of these crises was the fundamental sense that the import and aims of the humanities were increasingly marginalized from the purposes of education, from the meaning of modern life and from the activities and interests of the public at large. Socio-technical humanists took this core problem of relevancy to heart and in their engagement with new media found a way to deal with it directly. During the "crisis of two Cultures" socio-technical humanists' use of

educational television allowed them, at least rhetorically, to keep up with curriculum reform geared towards science and engineering and to expand their cultural authority by trying to guide the nature of television viewing habits and programming and by taking to the airwaves themselves. During the "crisis of engagement" the use of new educational media provided humanities educators an essential way to speak directly to student's experience of the world—for just as the traditional content of humanities instruction appeared disconnected from the concerns of the real world, so too did there appear a disconnect between the traditional medium bearing that content and the rest of life—between the worlds of print and electronic media. For others, the engagement with machine-readable text, allowed humanists to answer the call for a humanities-oriented council on technology by getting involved in the development of electronic bibliographic control and in the establishment of electronic networks.

Socio-technical humanists' engagement with new media had, as I've shown, four essential components. First, they endeavored, and continue to endeavor, to turn the threat of electronic media for the print-oriented world of the humanist on its head by transplanting traditional modes of critical print engagement to the customs and habits associated with new media. In so doing, socio-technical humanists end up, second, attempting to invert or subvert the use of new media advocated by other practitioners and third, trying to guide the nature of new media while its meanings and associated customs are still largely up for grabs. Fourth, and ultimately, of course, socio-technical humanists advocate for the use of new media both as a way to figure out their role and relevancy in an era of electronic culture—that is, by working through the exact relationship between texts and new media—and as a way to expand the social responsibility of the humanities. Both are in direct response to the humanities crisis in which they live.

Ultimately, charting the intellectual genealogy of the socio-technical humanities has allowed me to add a much needed perspective to humanists' contemporary situation. For the humanities in general, the legacies are, I hope apparent. Simply put: today is not the first time humanists have been forced to come to terms with expansive technology and its effects on society; today is not the first time humanists have been forced to see the potential migration of information, knowledge and culture from print to electronic formats as either a threat or an opportunity. The 1950s and 1960s, was like today, a moment when humanists were forced to either get on board by embracing the nature of a changing media landscape, helping to instill critical interpretative skills for new modes of media engagement or else stay entrenched within the confines of print culture and risk total irrelevancy. Thus it's important not just to know that the humanities have been at similar crossroads in the past but that they have a legacy of making necessary concessions to larger socio-technical forces when at those crossroads. That is, it's important to know that humanists have, in the past, been able to incorporate the principles of humanistic education and research into the uses of new media, and in so doing, co-opt that new media for their own purposes and, in effect, subvert the intended purposes of its originators and or primary advocates—for example, in trying to improve television programming by transplanting the literary experience of the page to the television screen or by using multimedia educational systems to facilitate the interrogation of reality instead of simply transmitting information more efficiently. Humanism is somewhat unique in its relationship to the phenomena of human affairs. Its self-professed purpose is to offer values and guidance. However, the accelerated development of science and technology over the last four centuries has often served to place humanists on the defensive at the very moment when they feel they need to offer guidance the most. Put another way, humanism often finds itself in a position where it has

something unique to offer at the same time that it has something unique to lose. My dissertation is about one of those moments.

For the digital humanities, the legacies are twofold. On the one hand, by looking at humanists' encounters with educational television, multimedia instructional technology and computing hardware, I've argued that early humanities computing was part of a larger effort among humanists to come to terms with all the features of electronic culture--it's capacity to store, retrieve and analyze information (computers) as well as its capacity to be impart information in a multisensory, immersive and associative fashion (multimedia educational technology) and its power to deliver information via the greatest mass medium in history to that point (television). In doing so, I've shown the degree to which humanists' efforts to come to terms with their role and relevancy in a world of electronic or digital culture has *always* involved an intellectual endeavor to reconcile the tension between text and image (educational television and technology) as well as text and data (computing). The standard story of early digital humanities includes only the latter: a story in which humanists struggled to translate and incorporate traditional lines of humanistic inquiry (interpretations of qualitative textual features) into new forms of analysis which computers could manage and manipulate (quantitative, data-driven questions about texts). But once we open up the story, once we see that early digital humanities of the 1950s and 1960s—what I call the "electronic humanities"—included within it, both early humanities computing and a corollary large-scale movement to intervene in the nature of educational television and technology, we immediately realize that electronic technology in these years forced humanists to reconcile the traditional features of the printed page (as well as it's associated habits of mind) with modes of audio-visual engagement *and* modes of data analysis at the same exact time. In some ways, it was a battle fought on two fronts. Early

humanities adopters of audio-visual and computing technologies had to deal with analogous confrontations with practitioners in their field; the former were told by their contemporaries that an emphasis on sound and image over text ran the risk of turning people into primitives (Joseph Wood Krutch, Jacques Barzun and others); the latter were told that an emphasis on data over text ran the risk of turning people into robots (Lewis Mumford, Jacques Barzun and others). Both ran the risk of emphasizing the inhuman. On the other hand, a history of the socio-technical humanities also demonstrates the degree to which the "immersive humanities"—those who embrace new media as a way to better exploit and highlight the inherently narrative, experiential and affective qualities of humanities teaching, interpretation and argumentation—have a robust intellectual legacy on which to draw, and further, allows us to better understand the need within today's digital humanities to help shape that other massively growing area of higher education—online instruction—that is, to help shape the nature of massive, automated instruction and, if possible, prevent humanities instructors from becoming mere content providers.

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