Bienvenidos
Thirty-Seventh
Military Librarians Workshop
November 15 - 18, 1993
Albuquerque, New Mexico

"GLOBAL INFORMATION:
THE SUN NEVER SETS"

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PHILLIPS LABORATORY
Directorate of Operations
AIR FORCE MATERIEL COMMAND
KIRTLAND AIR FORCE BASE, NM 87117-5776
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Lee R. McLaughlin, GS12
Project Officer

FOR THE COMMANDER

Dayton L. Silver, Col, USAF
Director of Operations

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THIRTY-SEVENTH MILITARY LIBRARIANS WORKSHOP
November 15 - 18, 1993

Edited by Lee R. McLaughlin

Phillips Laboratory
3550 Aberdeen Avenue SE
Albuquerque, NM 87117-5776

This Special Libraries Association, Rio Grande Chapter and Access Innovations, Inc. of Albuquerque, New Mexico, helped to make this a successful workshop. The military host, Barbara Newton, was the Program Chair and pulled everything together.

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The Thirty-Seventh Annual Military Librarians Workshop was held in Albuquerque, New Mexico, on 15-18 November 1993. Gretchen Cheung, Canadian Department of Defence, was the chairperson of the Military Librarians Workshop; Sandy Spurlock of Inhalation Toxicology Research Institute Library and Barbara Newton of Phillips Laboratory Kirtland Technical Library served as the program committee chairpersons.

The theme of the Thirty-Seventh Annual Military Librarians Workshop was "Global Information: The Sun Never Sets." The workshop, sponsored by Phillips Laboratory (AFMC), Kirtland Air Force Base, New Mexico, was held at the Sheraton Old Town in Albuquerque, New Mexico. Discussion topics included Emerging Technologies, New Approaches to Training Information Professionals in the United States and Eastern Europe International Information Research (Space), Knowledge Diffusion Project (NASA), Federal Library Contracting, The Virtual Library, Developments in Position Classification Standards, Access Russia, Relationships Between Libraries and New Information Entities, and the Library Services Alliance of New Mexico.
FOREWORD

The theme for the Thirty-Seventh Annual Military Librarians Workshop was "Global Information: The Sun Never Sets." If you have been cruising along comfortably in your own professional niche, you may be setting yourself up to become a casualty in the battle for business in your libraries. As greater demand develops in various communication areas, professionals in the information field who do not foresee future trends and who do not grow to meet those demands will fall prey to their more alert competitors.

Over the years, we've watched very talented people in the field drop by the wayside because they identified and reacted only to current trends. By the time they had geared up with appropriate marketing strategies for what was happening at the time, the real opportunities had already been consumed by more forward-thinking professionals.

The key to our success as professional librarians, managers, leaders, facilitators, and consultants is to anticipate future directions and to create solid strategies to deal effectively with them—before they become current challenges. We believe we have shown you some steps along the way with the dynamic, up-to-the-minute information that was presented in the workshops.

We would like to thank all who made this 37th Military Librarians Workshop so successful, especially the Phillips Laboratory library staff. Also, a special thanks to the Rio Grande Chapter Special Libraries Association members who brought new meaning to the word "PLANNING." They kept us on track. To Roger Coffin, Phillips Laboratory Engineering Branch, there are not enough ways to say thank you for all of your work in helping us to computerize the registration, the flyers, the invitation letters, the graphics for the program, and the list could go on and on.

Finally, we wish to thank our Commanders for hosting the MLW and all of you who attended the workshop. We especially want to acknowledge the contributions of those whose presentations made "Global Information: The Sun Never Sets" a viable workshop theme.

BARBARA I. NEWTON
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1. Welcome to the 37th Annual Military Librarians Workshop. This year's workshop is designed to bring the goal of mission excellence closer to fruition. The theme, "Global Information: The Sun Never Sets," couldn't be more appropriate. While your resources may be reduced, your responsibility to serve your military or public community continues as in the past.

2. The Military Library Division continues to look for more and better ways to help you, and this annual workshop is one of the key training opportunities available to enable you to better serve your various and diverse communities.

3. Welcome to the Land of Enchantment and have a great conference!
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Technology, Technophobia and the Gee Whiz Factor—
Comments on the Future of the Intellectual Meadow
In the Networked, Digital World

Paul H. Mosher
University of Pennsylvania
16 November 1993

We are going through a paradigm shift in the generation and transfer of
information; a profound transformation in the technology of knowledge. The rate
of change appears to be accelerating precipitously—so rapidly that ideas have
begun to change faster than the words to describe them, leaving us with a new
jargon consisting of approximate or ambiguous meanings that, combined with the
rapid technological change itself, makes the progress of the paradigm shift
difficult to perceive or describe clearly. Yet we know the changes are significant,
and we have been told that the whole passel of changes, taken together,
represents a revolution in the media of communication equal in scale and
importance to the invention of printing in the fifteenth century, or the invention
of the codex book 1400 years before that. It is worth pausing and taking stock,
in hopes that we may understand our "revolution" better—both what it is and is
not, what it implies and doesn't imply, so that we can act, react and plan
appropriately and in a timely way.

The paradigm shift stems from progress in electronic technology, and though it
was perceived in the 1960's, it still seems to move its own destiny, and we are
forced to choose between being prophets of electronic determinism, or troglodytic
Luddites blind to change and opposed to it; enemies of progress and technological
amelioration. It is worth distancing ourselves from the change for a short time to
reflect on it and its nature; the perspective gained may give us a clearer
understanding of what is happening and what our options are.

Our preoccupation with technology arose out of the Age of Reason and the Age of
Enlightenment. And this same period saw the birth of our fascination with
electricity and its potential for technological change. What did the words
technology and electronic mean in the eighteenth century, when the concept of
applied technology as a conscious result of empirical research may have
originated?

Samuel Johnson's Dictionary of 1755 is a good measure of the meaning of words
in the mid-eighteenth century. We find that the word technology isn't there.
Technical meant: "Belonging to arts. Not in common or popular use. In technical

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words or terms of art, they refrain not from calling the same substance the sulphur, and sometimes the mercury of the body." The word electronic is also absent, but the word electricity is: "A property in some bodies, whereby, when rubbed so as to grow warm, they draw little bits of paper, or such like substances, to them."

Such was the account given a few years ago of electricity; but the industry of the present age, first excited by the experiments of Gray, has discovered in electricity a multitude of philosophical wonders. "Bodies electrified by a sphere of glass, turned nimbly round, not only emit flame, but may be fitted with such a quantity of the electrical vapor as, if discharged at once upon a human body, would endanger life. The force of this vapor has hitherto appeared instantaneous, persons at both ends of a long chain appearing to be struck at once. The philosophers are not endeavoring to intercept the strokes of lightening." Who had been reading his Johnson? Benjamin Franklin; and this was the birth of electrical technology, the ancestor of our topic today.

So in 1755, electronic technology hadn't been conceived of. By 1933-34, 180 years later, when the OED first appeared, and Webster's great Second Unabridged Dictionary (also the age of the birth of the card catalog and the union catalog), technology appeared as the practical arts, systematic treatment of a subject, the science or systematic knowledge of the industrial arts, and more significantly: "The means employed to achieve material culture." Technological meant: "Resulting from improvement in technical processes to increase productivity." Electronic came into play in the Second World War with vacuum tube experiments and came to adolescence with the birth of ENIAC, the first "electronic" computer, at the University of Pennsylvania in 1946 (its 50th birthday being planned for celebration at Penn in 1996). Electronics is now well established in the dictionary as "The science dealing with the development and application of devices and systems involving the flow of electrons in a vacuum, in gaseous media, and in semiconductors. Thus "electronic technology."

As I hope you can see, words are important. They convey meaning and content so that we can communicate, transmit ideas, convey understanding.

**Technofallacies and the "Virtual Library" Concept:**
**The Gee-Whiz Factor**

Language, literacy, terminology, image and metaphor are important tools for technology, as they are for language. Without them we cannot agree on our vision or goal, and thus cannot reach it.

"Information explosion, serials crisis, the virtual library. An article in the November 15 Business Week tells us that "human knowledge doubles, while the
shelf-life of expertise shortens," an "astonishing increase," to ignite this learning explosion," "dramatically altered."1 This is the language of crisis: dramatic, imperative, immediate, it commands our attention and belief, even as it alters or exaggerates reality.

Technology also contains an immediacy factor; it not only speeds communication, it appears to compress time itself, creating a hyperpresent which appears to contain its own past and future. The pretense of technology is that it is revolutionary and exclusive; that it replaces old technology abruptly and absolutely like new political regimes are supposed to overturn old ones by revolutions. But Daniel Boorstin's Displace Fallacy reminds us that new technology seldom replaces old technology, it layers it or coexists with it, and the old technology may wither and disappear, or it may parallel new technology for a long time, like the auto and the horse, or the telephone, the fax, TV, radio, and movies. We shouldn't forget that it took thirty years, after all, to get the overhead projector from the bowling alley to the boardroom!

Daniel Boorstin also has reminded us that it is vital to remember that the terms information, knowledge, and one may add data, are not synonyms; indeed there are significant differences; if these are not observed, we quickly lose our way in the labyrinth of information technology.

Well Then, What Is Technology?

Technology as we know it, is a modern idea, and is part of that set of cultural concepts, ideas, and structures we call modernism. Technology and Modernism are closely related concepts. Among the characteristics of modernism is the displacement of people by things, and technology is using objects (things) to do things, using science or scientific principles. Thus recent technology has been driven, among other things by non- or anti-humanistic principles that can put it in conflict with culture and indifferent or opposed to issues or principles of cultural change. An example would be some of the underpinnings of the concept of artificial intelligence, a somewhat loaded and silly-putty term, like so many used in the field of electronic technology. At its most extreme, and not all AI types think this way, the computer is like a human brain, works like a human brain, at its ultimate development can perform functions and tasks of a human brain, may well become an improved, more efficient model of the human brain, leading to the replacement of Homo Sapiens by Machina Sapiens, thus dealing with issues of sexism once and for all.2

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2The term "artificial intelligence" reminds me of those supercapacities we used to call into play when we were children when we were backed into a corner during a superheroes game. By invoking a supercharacter's powers (Superman's, Wonder Woman's) we could instantly transcend our human limitations--and often the
Here, metaphor has become simile, simile has become the virtual thing, and the virtual thing is thought to replace the real thing. Whoops, be careful! Look at what language has just done. The mathematical physicist Roger Penrose has demonstrated the primal limit of computers as technology: computers are not minds, and cannot be, physically. They cannot "feel," they cannot "perceive." Computers do not possess "Consciousness."³

Uses of Electronic Technology: Technology Cannot Be Separated From The Uses To Which It Is Put⁴

In 1967, Marshall McLuhan and Quentin Fiore published a small but influential book, The Medium is the Massage, with a title which was a pun of an earlier McLuhan book, entitled The Medium is the Message. In the earlier book, McLuhan had argued that in modern society, the medium creates its own content: that people pay more attention to the form of information than to its content. "Societies have always been shaped more by the nature of media by which men communicate than by the content of communication," they wrote.⁵

In the 1967 work, the authors went one step further, to suggest that the popular media, having become aware of the power of form, had begun to manipulate the meaning by the form: to manipulate, disinform, and deceive. They alerted the world to the potential distortion of the new mass media.

"Electronic circuitry confers a mythic dimension on our ordinary individual and group actions. Our technology forces us to live mythically, but we continue to think fragmentarily, and on single, separate planes... Myth means putting on the audience, putting on one's environment."

In fact, they were early discoverers of the potential power of electronic media, inherent in electronic technology itself, of causing such fascination with the form of communication or information, that content could be overlooked or neglected.


⁵ The Medium is the Massage, p.8
Technology As A Means Of Control For Management In Business, Government, And Education


- Technology is considered the defining characteristic of organizations.
- Technology is an independent variable, and arrangements to get things done are dependent variables.
- Technology is a better basis for comparing organizations than the several schemes that now exist.

James Beneger, in his 1986 book, *The Control Revolution: the Technological and Economic Origins of the Information Society*, expressed the view that technology provides the means of control within the "information society." In the views of these thinkers, technology is an instrument of control or of power within industry, economic entities, governments, etc. Many of these views are technological updates of the views of Frederick W. Taylor, who wrote of "scientific" management as being characterized by the idea that productivity was a direct result of management's detailed control over labor, and thus over production. Discuss the computer as a replacement for the stopwatch--the ideas of control persisted, but moved into a new technology: that of the computer. For Harold Leavitt, the computer came to be used as a replacement for the stopwatch in the pursuit of an effective technology for control and analysis of productivity.

Technology As A Tool For Social Control And Totalitarianism

The powers of electronic technology can be used for good or for ill. Herbert Marcuse posited in *Eros and Civilization* that technology had evolved to the point that it could release time of workers from dull, redundant, bureaucratic, paper intensive tasks and allow more time for continuing education, self-improvement, and socially productive endeavor. He saw this evolution as being made possible by advances in the newly evolving electronic technology. By the time of the 1966 edition, he rejected his earlier optimism, deciding that humans come to imitate

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the structures, systems, and implied values of their inventions in socially repressive ways and that technological advance was as often repressive and controlling as liberating.\(^9\)

Marcuse and Marshall McLuhan both pointed out the potential contributions of electronic technology—especially as applied to the media—to the growth of totalitarianism. The issue underlying "virtual reality" is whose virtual reality. The passive nature of many media applications of technology is another similar concern. A citizen population trained by the media to become couch potatoes, passive and not proactive, could result in profoundly subversive effects on the social principles upon which democracy is based.

**Technophobia And Its Discontents**

Phil Baker has written that information overload anxiety is a condition where "the mind reels before the sheer too-muchness of information as it proliferates like junk mail."\(^{10}\)

A recent op-ed piece in the *Economist* reported the quandary of the Princeton Library, which had obtained a trove of video reels recording George McGovern's 1972 presidential campaign—on 2 inch (51 mm) videotape. But Princeton, in 1993, no longer possessed a machine capable of playing it, or transferring it to a newer medium. The National Archives, when asked, informed Princeton that they did have such a machine, but that it was in such fragile condition that they would not allow it to be used for fear it would break.\(^{11}\)

The issue is not just the life span of the videotape (about 20 years), but of the technology that enables its use. What about computer disks or tapes? Magnetic tape has about a 15 year life span before degradation sets in; laser disks more like 20 years. For them, there is yet another dimension of the issue: data files or spreadsheets may not be retrievable without the requisite software programs, since there is no ASC or ANSI standard. And what about e-mail, which increasingly records the decisions, instructions and explanations of administrative life in the United States? What if e-mail becomes multi-media?

"Dreamy technologies dismiss these problems as teething troubles. They foretell a fully digital world where everything can be copied perfectly and data will flow between formats without a hitch, housed in storage media of unimaginable

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\(^9\) *A Philosophical Inquiry Into Freud* (1955) [see also *One Dimensional Man, Studies in the Ideology of Advanced Industrial Society*, Boston, 1964].


\(^{11}\) *The Economist*, September 18, 1993, p.93
density...Historians of the future may find much to say about the fact that the most thoroughly recorded years in the history of humanity ended up among the least well reserved."¹²

**Technofuturism**

There are also "technofuturists" who project the future of society as the future of maximized products of technological change: because technology is capable of it, it not only will come to pass, but should have already--this is a kind of technological determinism beloved of hardware and software manufacturers.

**Technopolitics**

The politics of open standards remain Byzantine--perhaps most paradoxically in desktop micros, where it is most important. The division of directions in the UNIX world is a prime example, where IBM, HP, and DEC united to develop their own version of UNIX to keep SUN and AT&T from "gaining control of" the operating system that was initially designed to support open systems design.¹³

**Technology, Cost, And Cooperation**

Do technology and its costs normally save money? This has been the promise of electronic technology since its inception in banks, the airline industry, and government. In fact, the application of electronic technology usually introduces possibilities of increasing functionality and service levels that appear so attractive that greater, rather than lesser, cost is often the outcome. Part of the new paradigm of electronic technology may be that we are faced with an enormous growth of expectation on the part of our user community which represents an unmanaged cost with sometimes marginal value added. It would be more accurate, with the benefit of hindsight, to say that electronic technology offers greater opportunity to manage or control costs, if systems are consciously designed to do so, e.g., when management information components are built into the design phase.

We are also discovering that electronic technology has become a part of our growth culture--that very growth culture that confronts us as we try to cope with steady-state or declining budgets reflecting the sober economic realities of the last decade of the twentieth century. Not only are we confronted by the growth curve of technological obsolescence and the perpetual demand to upgrade, we are faced

¹²Ibid.

by rising prices for electronic information created by layered costs: the cost of the license (repeated, not one-time), added to the cost of the required software, plus the necessary software, plus the costs of networking. These often add up to a significantly higher price than the paper product they replace.

One would also imagine that the introduction of electronic technology, through its strong suit in communication and interconnectivity, would optimize opportunities for cooperation and collaboration among organizations, and the component parts of organizations. However, although intuition would suggest that electronics should increase networking, intercommunication, integration, and information sharing, Sue Martin has pointed out that libraries have swarmed away from the utility processing that appeared to offer wonderful opportunities for sharing and collaboration in processing toward local systems which make cooperation among libraries more difficult, and she reports one larger library network remarking that "cooperation is an unnatural act."¹⁴

**Human Behavior: The Missing Dimension Of Technology**

Just as technology cannot be separated from its uses, technology cannot be separated from its users. Human engineering—ergonomics—must remain a key consideration of technology. If we eliminate the human dimension from technology we will miss the point: technology is not an end in itself, it is a means to an end. Technology is the means employed by humans to enhance material culture, hence applied science. Technology is tools; computers are tools. In fact, the promises of electronic technology can only be achieved through thoughtfully assembled and carefully planned alliances—symbiotic alliances, if you will, between humans and technology. Effective alliances between humans and technology, focused on goals and results useful to society, produce the great benefits of electronic technology.

**The Benefits Of Electronic Technology**

Electronic Technology, as a tool, produces its most beneficial results, when it is applied to certain kinds of uses. These can be summarized as:

- Connectivity
- Communication
- Integration
- Interaction
- Flexibility

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Those applications that use more than one of these capacities are most successful and result in the clearest and greatest benefit. The list above has proved useful in planning electronic library services and in evaluating programs and resources based on electronic technology. There is a set of design criteria that I have derived from experience and from the application literature that has proved useful as well:

- Keep it simple, keep it open
- Design for your audience, not for your engineers
- Make work easier and more rewarding
- Improve productivity
- Focus on strategies that add new values or add value in new ways
- Use universal or common standards
- Observe both physical and electronic ergonomic principals

There are other factors, often psychological or social, that play an important part in effective application of any technology. These include such issues as the relationship between technology and personality, feelings, group dynamics, language and communication, and interpersonal relations.

**Notes On The Post-Electronic Age**

Culture creates technology, though it sometimes seems the other way around. As culture calls the imperative of technology into question and as we begin to perceive the limits, as well as the opportunities, of technology more clearly, we will be entering the post-electronic age, in which we will be able to manage the technology more easily, leading it to new, productive uses, rather than feeling driven by it.

As we create the digital information environment--based upon a virtual network--there is a danger that we may act out the prognostications of Marshall McLuhan and worship the medium to the point that it becomes both the message and the massage rather than a tool to carry out more effectively certain functions for which the electronic medium is a superior vehicle. The isomorphic transformation of the electronic tool into a social and isoreligious icon transforms technology into information, data into knowledge, competence into wisdom, means into ends, and transforms value sets (such as democratic principles) in significant and potentially dangerous ways. Among other things, it can lead to division of society, and the world, into information haves and have-nots in ways that are significant and dangerous. We need librarians' cool assessment of technology--its benefits and disadvantages in each application. We are the students of information: its nature, generation, production, distribution, and consumption. We must work in partnership with technologists and engineers so that the nature and useful applications of technology are remembered and understood. Only librarians can help prevent the techno-babel that threatens to overwhelm our future.
Rights, Revenues, And The Control Of The Data Superhighway

- Did you know that 40% of the world's population has no access to electricity?
- That 65% have never placed a phone call?

The nature of the evolution of Cyberculture has meant that it was led in the first place by engineers and technologists and secondly by investors and economic interests. Notsurprisingly, the first of these groups was utopian and altruistic. The second has searched for profit and had strongly suggested that economic or market principles should define the nature of rights within the developing electronic environment. The current administration in Washington appears to have bought the economic determination of the profit sector, only dimly perceiving the open-market, research-based, free exchange, altruistic principles of the initial designers of the new information environment. So there is a move of information responsibility and support from NSF and Education to Commerce. Nor has the present administration yet conceived of the need for leadership in the information arena, where public, education, research, and communication interests must be balanced with economic or commercial interests.

The playing field is that of rights, and so far there has been too little recognition that the concept of rights has its primary base in law—with the U.S. Constitution as the bedrock, and with a house built of statutory law on that base. We have too long left the definition of rights to the presumed claimants to those rights, rather than understanding the legal basis of information or copy rights.

Technology is a tool; a tool to be used by humans for socially and culturally desirable ends. Technology is a tool of people, by people, and for people. It is up to each of us to accept responsibility within our organization for this mission. Human engineering and human responsibility are essential to the planning and application of good technology. In this process, human networking is as important as electronic networking. If technology is the uses to which it is put, what will those uses be?
NEW APPROACHES TO EDUCATION AND TRAINING
OF INFORMATION PROFESSIONALS—
U.S. VERSUS EASTERN EUROPE

José-Marie Griffiths
Director, Center for Information Studies
University of Tennessee, Knoxville

1. General Library Environment in Eastern Europe

It is difficult to compare library and information science education in Eastern Europe and United States without first considering the environment in which libraries operate in these two very different parts of the world. One of the most striking differences between libraries in each region is that libraries in Eastern Europe are mostly closed access. Access is closed physically in that stacks are not generally open to users, with the exception of small reading rooms for reference materials. Intellectual access is also limited in that most libraries provide access only through author and title catalogs. Subject catalogs, when they do exist, are usually for librarian use only. Furthermore, the subject catalogs that do exist tend to use in-house developed subject headings and are not necessarily easily adaptable for shared cataloging systems.

Libraries in Eastern Europe use some automation although applications are fairly limited and reflect the state of library automation in the United States about twenty years ago. Applications include catalog card production (for a single library or a central library with branches), production of national bibliographies, production of abstracts and indexes for specific subject bibliographies, production of lists of foreign language material, and database searching.

Recently, libraries in Eastern Europe have started to implement integrated library systems (imported from Europe and the United States and usually funded by foreign foundations). CD-ROM databases are also emerging as a format of choice and Internet access is available from major cities. During a recent visit to Warsaw, a long-distance telephone call took six hours for a connection; meanwhile, I was able to connect from the Warsaw University to the University of Tennessee via the Internet in less than two minutes.

The administrative environment in Eastern Europe libraries is different from that in Western countries. The environment has been extremely rigid and highly
centralized. Library directors were generally political appointees and librarians were expected to take orders from above. This climate tended to suppress any innovative or creative spirit among librarians and encouraged little sense of user orientation.

The above points all describe the overall environment within which Eastern European libraries operate and are not necessarily indicative of all libraries. Pockets of innovation and user orientation certainly exist but they tend to be the exceptions rather than the norm. Many senior-level Eastern European librarians have visited libraries in Western Europe and/or North America and are aware of the user-oriented models that exist. However, the changes that need to occur in their infrastructures are daunting and it is difficult for librarians to know where to begin.

2. Eastern European Model for Library and Information Science Education

The Eastern European model of library and information science education is based on the Soviet model and contains four distinct levels: library technicum, library institutes, postgraduate library education and library education for subject specialists. Each level is described briefly below, but more information can be found in Raymond.¹

a. Library Technicums

The library technicums offer a three-year program for those who have not completed 10 years of high school. These programs are similar to the library technician programs in community colleges. The programs include both general education as well as specific library and bibliographic training. The focus of these programs is on basic skills to perform library functions and is more practical than theoretical. Graduates are able to run village, collective farm, or trade union libraries and departments in city libraries. There is some evidence that many libraries find graduates of the technicums to be more "useful" than graduates of the higher level institutes.²

b. Library Institutes

The library institutes offer a four-year program for those who have graduated from 10 years of high school. Students must also pass exams in history of the country, literature of the country, language of the country,

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and another foreign language as an entrance requirement. The program is split roughly equally between general education and specialized courses. The specialized courses include general librarianship, bibliography, principles of popular education, history of librarianship, history of the book, children's literature, and specialized subject bibliography. Generally, the institute programs place more emphasis on history and theory than the technicums which focus on hands-on work. Graduates of the institute programs have the equivalent of a baccalaureate degree.

Both technicum and library institute graduates are required to do three years of postgraduate practical work in an assigned library before their education is considered complete.

c. Postgraduate Library Education

Candidates for the doctoral level degree programs must have graduated from an institute program and have completed the three-year postgraduate practical experience. They are required to take classes in education as well as librarianship and information science and they must pass exams in a foreign language, Marxist philosophy, and their field of specialization (either library science or bibliography/information science). Note that the requirement for Marxist philosophy which ran through all levels of education in Eastern Europe has now been dropped. Furthermore, the predominant foreign language for the non-Soviet countries was Russian. Today, there is a preference for other languages - German, English, French, etc.

d. Library Education for Subject Specialists

Subject specialists (linguists, historian, scientists, etc.) who are employed in libraries, but who do not have a library education, are required to take library science extension courses.

Today, library and information science education in Eastern Europe is differentiated, not by type of library, but by subject areas of literature and by type of internal library function.

3. Examples of Curricula

To demonstrate the scope of degree programs in library and information science programs in Eastern Europe, let us consider the undergraduate degree program offered by the Department of Library and Information Science at Charles University in Prague. The program includes a core curriculum and possible specialization in three areas: scientific information, librarianship, and bibliography.
Note that most courses are required - a major difference between programs in Eastern Europe and the United States.

1. Core Curriculum

1.1 Social Science Background

Required Courses

History of Philosophy
Methodology of Science
Logic
Social Psychology
Economics

Elective Courses

Sociology
Psychology
Education
Aesthetics
General History

1.2 Library and Information Science Background

Required Courses

Microcomputer Operations
Speed Reading and Introductory Course
Introduction to Research
Social Information
Social Communication
Information Technology
Science of Documents
Retrieval Languages - Theoretical Foundations
Information Analysis of Documents
Identification and Description of Documents
Information Ordering and Retrieval Languages
Construction and Organization of Information Files
Theoretical Foundations of Information Systems
Document-Based Information Systems
Bibliographic Information Systems
Data-Based (Factual) Information Systems
Design of Information Systems
Organization and Construction of Databases
Applications of Computer, Telecommunications, and Reprographic Technology
Seminar
Practical Training

1.3 Languages (courses are required in three world-wide languages)

2. Specializations

2.1 Scientific Information

Required Courses

Quantitative Methods
Information Provision for Science, Technology, and the Economy
Information Services and User Training
Information Retrieval
Design, Operation, and Exploitation of Computerized Data Systems (Fact-Based)
Synthesis and Evaluation of Information

Elective Courses

Four courses from the electives list - see end of curriculum

2.2 Librarianship

Required Courses

Organization and Management
Library and Bibliographic Services and User Training
Comparative Librarianship
Bibliopedagogy
History of the Book and Librarianship
Sociology of Literature

Elective Courses

Four courses from the electives list - see end of curriculum

2.3 Bibliology

Required Courses
Introduction to the Study of Bibliography
Paleography
Codicology
Typology of Printed Books
History of Czech and European Book Printing Until the 19th Century
History of Libraries
History of Earlier Czech Literature
Foundation of Christian Culture
Genealogy and Heraldry

Elective Courses

Two courses from the electives list - see below

Electives for all Specializations

Mathematical Linguistics and Machine Translation
Theory and Practice of Contemporary Information Activities
Fundamentals of Mathematical Logic
Fundamentals of Marketing
Expert System Software
Information and Society
Personal Documentation for Scientists
Standards and Patent Information
Readers' Psychology
Sociology of Reading
Literature for Children
Methodology of Working with Children and Youth
Aesthetics
Contemporary Czech and Slovak Literature
Booksellers and Publishing
Rare Books of the 19th and 20th Century

4. Educational Needs in Eastern Europe

In spite of the seeming comprehensiveness of the four-year undergraduate program, there are some clear gaps in the educational programs currently offered. They include more practical aspects of the following topics:

Automation and technology - more hands-on experience
Business and financial management
Planning and implementing plans using participatory approaches
Research methods and statistics
5. Concerns With Library and Information Science Education in Eastern Europe

The literature contains references to several areas of concern with library and information science education in Eastern Europe. What is interesting about these expressed concerns is that they are similar to concerns raised in the United States as well. The concerns include:

- Students lack a sufficiently broad educational background - in the United States the concern is that library and information science programs do not attract enough students with specialized backgrounds, while it is also argued that a broad liberal arts background is the best qualification for entry into programs.

- A university-level education is a necessity for librarians working in technical and academic libraries - in the United States that accredited master’s degree is considered the entry level qualification for librarians, although many public and school libraries hire individuals with lesser qualifications.

- The quality of faculty in smaller institutes and the extension programs is of concern - similar concerns have been expressed in the United States, particularly the lack of research activities by faculty in smaller schools and the extensive use of adjunct faculty for some extension programs.

- In four-year institutes it is impossible to teach all subjects in the curriculum adequately - in the United States there are concerns that a one to one-and-a-half year program is insufficient for all that needs to be covered.

- Graduates leave the profession for better paying, more prestigious jobs - a long-term concern in the United States.

- Library education is still primarily oriented towards public and children’s librarians - in the United States there is concern that much of the education is geared to public and academic librarianship.