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ABSTRACT

The report is a verbatim record of the Colloquium on Library Networks. The topics covered include: (1) communications technology and how it might be utilized in library type applications; (2) shared resources via communications; (3) the telelecture (an amplified telephone call) for sharing human resources; (4) audio tapes and their use via remote access; (5) compressed speech and its use in audio tapes and (6) teleprinters and their use in libraries. (Author/MM)

COLLOQUIUM ON LIBRARY NETWORKS

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KENT CENTER FOR LIBRARY STUDIES

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(1) Edited by EDWARD M. HEILIGER

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EDWARDS: I have chosen this morning to make a few general remarks concerning the capabilities of communications technology and how it might be utilized in library type applications. Then, we can place a telephone call to Mr. R.W. Kennedy, who has been deeply involved with automation and the use of computers throughout the Bell Laboratories Library System, and if you like, we can place a telephone call to Bob Donaldson, with the Trans-Canada Telephone System and ask him any questions you have concerning intercity communications in Canada. When we think about sharing resources, the first type of resource that we consider, is really the most important, the Human. This is a slide of an "urban" area in Carbon County, Wyoming. In Carbon County, for a number of years, communications has been used to share faculty resources throughout the school system, to make available additional rich resources which wouldn't otherwise be available to each individual school. As an example, Mr. Leonard Bernstein's very busy schedule would not allow him to visit with the school system in Carbon County, in person, but through telelecture (an amplified telephone call), he has been able to visit with many of the students and discuss music. But you are familiar with telelecture through your program here at Kent State. This is but one of the many telelecture programs throughout the country today, which facilitate sharing of teaching talent. Another example which illustrates the use of telelecture in sharing resources, with the additional capability of Graphic Information, can be found on Block Island - just off the state of Rhode Island. Here, mathematics are taught from the Mainland. With telelecture, the students can interact with the teacher much as if they were in the same room. The visual component provides the notes or the remote blackboard. Resources, as we know, are not all human. In addition to the world of print today [illegible] resources and information stored in computer memory, various forms of microform, slides, eight and sixteen milimeter film, audio and video tape, and many other forms. Much of the recent educational research has concerned itself with allowing students access to such resources and information when motivated to learn. Likewise, if we, in administration, are to be fully productive, we too must have access to the right information at the right time. This slide portrays a young lady at the University of Indiana, retrieving information stored on an audio tape on the campus at Bloomington. However, this could be any one of a number of universities. And we must remember that the need for information, the desire to learn, doesn't stop because one retires to

the dormitory, the sorority house, an apartment, or home. Since we know that we learn when we are motivated, doesn't it make sense to extend such resources and information to these places? This is being done by communications today. At Oak Park and River Forest High School, just outside Chicago, students utilize study carrels at the school. Equally important, the same information - audio tapes - are available to the students from their home, over their home telephone. By calling the Resource Center, just like calling a friend, any one of two hundred and twenty-four audio tapes can be retrieved at will. Today it is possible to add another dimension to the capability of retrieving information stored on audio tapes - that of compressed speech. We know that we can listen and comprehend at rates much faster than that at which we normally converse. Some papers say that we can listen at rates of 375-400 words per minute with normal comprehension. If this dimension is added to audio tapes, it is just possible that it might open up a new vista to information storage and retrieval. Some also say that the converse of compressed speech, expanded speech, holds great promise for the slow learner. Have you all had an opportunity to listen to compressed speech? Let me call a demonstration tape in New York City.

(DEMONSTRATION)

RICKERT: Is there any control, or does it have to be set at a standard?

EDWARDS: These demonstration tapes have a compression rate of twenty [illegible] per cent. They are played on a tape recorder at normal speed, otherwise the pitch of the recording would be higher or lower than normal. Had they been electronically arranged at, say 19 or 32 per cent, they would play back at that rate of compression.

RICKERT: But not in blocked units, right?

EDWARDS: Assuming that the audio information can be compressed from the original, it should be possible to arrange the information in segments. I understand the primary purpose of inviting us here this morning is to discuss how communications technology can be utilized to access information in some form or media, of which audio tapes is only a very small part. This type of use of communications to access and to share is not new to you. You have utilized TWX service for years. Before I left New York, I glanced at the

TWX Nationwide Directory and counted over 250 listings for libraries, and I'm told that there are over 800 total teleprinter services throughout the world, utilized to locate the right information and gain access to it. Most of the uses which I am familiar with in the United States relate to interlibrary cooperation, primarily for interlibrary loan and other uses, such as cooperative acquisition programs, cataloging, etc. One recent publication quoted a librarian in Kentucky concerning the reduction of time from approximately 30 to about seven days in locating and receiving a borrowed volume. Today there is much discussion of the use of communications technology to access information stored in computers, Micro-fiche, Micro-dots, and other high density media - in short, large data banks. Since its inception, EDUCOM (Inter-University Educational Communications Council) has discussed the possibility of sharing data banks with the university universe, as they become available. I'm sure all of you have read EDUNET, which documents the capabilities of networks for these uses. For such types of applications and for these large volumes of information, TWX services may not provide the speed or sophistication required. Volumes of information like these would probably require speeds of information transfer which can be provided by the regular communications network - the one used for local and long distance calls. Today, speeds up to 3600 words per minute can be attained over the network. The business machines are connected to the network over a special business telephone called a Data-Phone Set. The Data-Phone Set provides for dialing and controlling a call and conditions the output of the business machine so that it is compatible with the network. If you choose, you may provide your own device to condition the output of the business machine so that it is compatible with the network. A number of electronic firms manufacture Modems which will perform this function. The Modem can then be connected with the network through a device known as a Data Access Arrangement. Through these means, many firms and institutions are using the network to access and retrieve information. One large data base and retrieval system which will illustrate the point is the National Crime Information Center, operated by the Federal Bureau of Investigation in Washington, D.C. The FBI and law enforcement agencies throughout the country have immediate access to over 1,200,000 records relating to wanted persons, stolen automobiles, stolen license plates, stolen boats and other (serialized) stolen articles. Access to any qualified agency is provided

through communications. A recent situation will explain the operation of the system. You probably read the press version of the robbery in southern Ohio a few weeks ago. During the robbery of the Savings and Loan Institution, four people were killed, although the amount of money stolen was very small. Four days later, in New Mexico, a Highway Patrolman was cruising at night and noticed a parked automobile with three people inside. He stopped, questioned the people and inquired concerning the three individuals with his dispatcher. His dispatcher immediately queried the NCIC Data Base in Washington, and within a few seconds was given instructions to apprehend two of the three in connection with the Ohio robbery. The third was a good hearted samaritan who had given a ride to the two suspects. The NCIC System also exhibits some of the characteristics of Resource Sharing at the local and then the national level. Most influentials believe that sharing systems will first develop on a local level. Requests which cannot be filled there will be referred to a National or Specialized Resource Center. In connection with NCIC, the system operates like this: some states have developed their own Resource Centers which can be queried by local and state law enforcement officials and if the information is not available at this level, the request can be referred to Washington. Already, I am told, Florida, Georgia, North Carolina, Washington, and Indiana have developed such systems. Some states also utilize information retrieval systems to provide up-to-date information to their state legislators in connection with pending legislation. Five or six states now have information systems where the data base is updated daily with the latest status of legislative bills. If a congressman desires the latest on a particular bill, he queries the computer through a cathode ray tube or a teletypewriter-like device. Abstract requirements can be met through the teletypewriter. I know of no library system that has a complete list of its resources available for immediate computer access. Communications networks are being used to share their resources. In New York, for example, some fifty libraries throughout the state utilize teletypewriters and communications networks to share their resources. If material is desired in one library and unavailable, the request can be filled by another or the State Library. I understand that very shortly a computer will be utilized to control the circulation. My friends from Ohio Bell also tell me that a firm in Dayton will very shortly provide research assistance to law firms throughout Ohio via

communications. A data base will be established which can be accessed by teletypewriters, facilitating the research of appropriate precedents. If the data base is very large and the volume of information which must be retrieved or shared is very large and the time period relatively short, we must think of higher rates of information transfer and communications channels with faster speeds. These speeds would exceed those possible with the Dial Network. This group of large communications channels are called Broadband Channels. They facilitate speeds of information transfer up to 250 kilobits per second. They are fast enough to allow computers to load share effectively. These channels are available for digital and analog type transmission. An interesting example is the system called the Triangle University Computation Center located in the Research Triangle between Durham, Chapel Hill, and Raleigh, North Carolina. Here one very large computer is linked by broadband channels with smaller computers on the campuses of Duke University, University of North Carolina, and North Carolina State University at Raleigh, so that each can have the advantages of a large computer. The same computer is also made available to 45 other colleges and universities throught the state by slower communications provided over the state Government Communications Network. Another communications device which will probably be the most universal device to access and retrieve information in the future is already receiving extensive use today. The device which I am referring to is the Touch-Tone Telephone. You are probably aware that the Bell System has provided the button telephones for some years to facilitate speed and accuracy of dialing. As an adjunct, however, the Touch-Tone Telephone can be used to query computers and retrieve information in voice. Already, over 150 banks throughout the country have installed systems which allow tellers and other bank officials to query the data base and retrieve information concerning a particular account. One large use concerns check cashing. If I go to my local bank and ask to have a fifty dollar check cashed, the teller can call the computer, key in an identifying code, key in my account number and receive instant voice verification of my balance and know immediately if my check should be cashed. One nationwide credit card firm has a similar system. If my restaurant bill is quite large, the manager simply calls the computer, inputs my card number and knows immediately if the charge should be allowed. You might be interested to know that many other uses are contemplated. The National Institute of Health is

developing prototype systems which the medical world can use to access information immediately. Computer programs are being written which show how a doctor might utilize the capability of a computer to assist him in diagnosis and treatment. One program which is demonstrable today is a burn therapy program. It will immediately give a doctor a possible treatment. Another will tell the doctor if two drugs are compatable. We will call the computer now and demonstrate both programs.

(DEMONSTRATION)

RICKERT: This is not a series of tones that operate as a voice out of the computer, but a record that sends off what someone has recorded before?

EDWARDS: I cannot give you the technicalities of the generation of the speech. I do understand, however, that the voice response systems are available with different sizes of vocabulary.

RICKERT: Are they operational?

EDWARDS: Yes. Each of the bank systems, credit card systems, that I mentioned are operational. Another communication media which is discussed in library applications today is television. I recently read a report published by a national organization which inventoried the many ETV systems utilized for instruction in this country. In addition to the traditional uses of ETV, the report discussed the possibility of using the visual medium to transmit other information in the hours not used for instruction. In one instance, information was being transmitted and photographed at the remote location. Other people are considering using the communications capacity to send graphics and data. Recently, two state authorities released bid specifications for statewide ETV systems which contemplated the use of the communications capacity for voice and data in the off hours. We along with others responded to the bid specifications.

RICKERT: Is this division of use, is it on a schedule or can it be reset at any time?

EDWARDS: On these particular specifications the use was under the control of the customer. Since the primary use of the system was contemplated to be ETV, I would imagine the instructional programming would be the controlling use.

HEILIGER: In your experience with Telpak, are there savings involved?

EDWARDS: Yes there are. As you know, Telpak is a service which provides a large communications capacity which can be incrementally used by the customer. The bulk capacity can be provided in a manner which is more economical than, say, many small communications channels.

HEILIGER: This (savings) is something you can sell to a university administration. If the long distance bill to the State Capitol is large, perhaps for the same amount or slightly more, all of the facilities of Telpak could be purchased.

EDWARDS: Very true. And you may want to remember that there are two Telpak capacities. The first capacity provides the equivalent capacity of sixty voice grade lines and the second provides the capacity of two-hundred-forty voice grade lines. This capacity could, as you say, be utilized to provide communications for voice or data transmission. Or the capacity could be used as a very large, broadband, communications channel. Or the capacity could be used alternately as a broadband channel and many smaller channels. Another communications service which is now being trialed by a large customer in Pittsburgh is picturephone service, a service which will allow a customer to see and hear the person to whom he is talking. In addition, it will also have the capability of transmitting graphic information and data transmission. The firm which has been trying picturephone service has used it for visual and audio communications between Pittsburgh and New York City and for local access in Pittsburgh to a computer to retrieve information. The retrieval application would probably be of the most interest to you. A telephone number is assigned to the computer. The person desiring information calls the number, identifies himself with a discrete code through the touch-tone dialer associated with the picturephone set and then retrieves information from the data base. The information is displayed on the picturephone tube. This morning we have reviewed some of the applications of communications technology which are being used today to access information, to share resources: human, computers, print, and others, so that a resource of one can be a resource to many. I recognize that some of the applications discussed were utilized in business and government and not in libraries. I also recognize that the problems of indexing, file organization, etc.,

are much simpler than those which you face in establishing large data bases accessible to any and all. My point is this, as you tackle the tasks of applying networks to library applications, we would like to be a part, to work with you and share the experiences which we have had. One such experience relates to the experience which the Bell Laboratories has had in automating facets of their library system such as circulation control. One of the people who coped with and overcame the many complexities of the transition is Mr. Robert Kennedy, who is home today, after casting his ballot this morning for candidates of his choice. At this time, I would like to have Bob visit us by telelecture and share with us his experiences and tell us about the Bell Labs Library System.

HEILIGER: This is live, isn't it?

EDWARDS: Yes it is. He will be talking from his home telephone. If you have any questions use the microphones to interrupt and ask them...Good Morning, may I speak with Mr. Kennedy, please? Hello, Bob? This is J.C. Edwards. I'm at Kent State University, as you know, and I'm in a conference room with Mr. Edward Heiliger and fifteen distinguished gentlemen and two very attractive ladies. We've been talking about some of the capabilities in network communications today. We felt that the activities of your people at the Labs in connection with automation and the utilization of computers and communications in the Laboratories Library System might be of interest. So, we would like to have you chat with us for a few minutes and tell us some of the things you have done.

KENNEDY: All right. Perhaps I should first say something about our library environment, although some members of the audience may be familiar with parts of it. Bell Labs has about eighteen or nineteen library units dispersed over some ten states. The primary concentration, as you may guess, is in New Jersey. There is some premium put on network communications. Indeed, adequate communication ranks not less importantly than computer systems, devices, etc. in insuring proper operation of the network. Now there is a fundamental point I should make, and that is that unlike most other large industrial libraries - IBM, GE, GM, for example - the Bell Labs library system operates as an interdependent, integrated network. As a network, certain functions are centralized and these functions include what many universities would understand to be reasonably appropriate centralized functions: systems analysis, computer programming,

technical processing and so on. In addition, our centralized activities include a number of special services such as translating, information publishing and alerting, and the information scientist services, etc. (The information scientists are Ph.D.-level people on the library staff who undertake the more difficult searches, evaluate literature, etc.) The local or decentralized services - loans, reference , etc. - are obvious. Now although a library network is not uncommon in the university world, it doesn't seem to be a standard of industry as a whole in the United States. We strongly subscribe to the concept but as I've said, it does put a premium on good communications around the network. Some of the distances are sizable -- one library operation is in the middle of the Pacific Ocean.

EDWARDS: Where in the Pacific?

KENNEDY: Kwajalein Island, reasonably close to the middle of the pacific. Another library is in White Sands, New Mexico and another, the newest one, is in Denver. Well, I guess it goes without saying that the single most powerful on-line real-time communication device is the one we're now using. As Mr. Edwards may possibly have mentioned to the audience, the Bell system, including the Bell Labs, the Western Electric Company and the AT&T Company, have access to a corporate network called Cornet. Did you mention that, Mr. Edwards?

EDWARDS: No, I did not.

KENNEDY: The corporate telephone network links all Bell Laboratories together (I'm looking at it from our point of view now) and with the AT&T and the Western Electric Company. Looking from the library side we would regard this as the most powerful single communication device, and it is used intensely between our libraries. Now we back this up to a teletype network, and use that quite a bit too, but the telephone happens to give us a great deal more. In addition to this, our largest libraries have a telereference system, as we call it. This is merely a message recording system which is available to any employee at any time from anywhere. Thus a scientist working at home late at night can, for example, phone telereference service at his nearest library and ask that a paper that he just discovered in his reading be sent to him the next day. He will get a response that day. It is frequently used by scientists who are travelling some distance by air. Some people find that one of the few times to get

reading done is when they're travelling by air. By the time they arrive at a remote point they may have citations that they want. They phone back to the telereference service and ask for a copy or the original to be placed on their desk by the time they return. This is a much-used service, and of course it's using an everyday telephone recording device. Very cheap, too. I assume you have been discussing facsimile, J.C.?

EDWARDS: We touched very briefly, Bob, but not in detail.

KENNEDY: We have had some limited experience in our own library system. I don't know whether it will mean anything to anybody else, but for several years we have had facsimile of the rotary scan type to transmit library materials to three or four of our major libraries. Frankly, we gave up on it. We found it was wanting at that point in time which is, I must admit, ten years ago. Wanting for a variety of reasons -- primarily speed, cost, and flexibility. However, we do have a facsimile transmission between several of our major laboratory locations and from time to time, the library does make good use of it. I guess the only point I'm making is that in our own particular installation, we did not find sufficient use of facsimile to justify it for a full-time library installation. Of course, the rotary scan was difficult from transmitting materials from bound volumes. We have also used telewriting in our library network. We had four units associated with our telewriter setup, and I might say this worked very well, but we superseded it eventually by a new computerized record system. We have also been using from several of our points LDX Xerox equipment and this has worked very well indeed, in the limited applications we have tried to date. This again is not a library to library system per se, but a Bell Labs to Bell Labs system, of which the library makes some use. Now, if you want, I'll talk a little about the computer systems.

HEILIGER: May I interrupt just a minute? This is Ed Heiliger. On this LDX business, does Xerox have the new LDX equipment out yet? They've been working on it, I know, the past couple of years and supposedly it is going to be a lot cheaper when they get it out. Have you heard anything about that?

KENNEDY: I don't know what constitutes the new LDX, Ed; the equipment we had here was associated with a graphics output system from a computer and the original reason for its installation, I believe, was to hurry up the

transmission of graphic images generated on the face of a CRT from one point to another. This was the equipment which I think was transmitting four pages per minute rather than four minutes per page, so it was pretty high speed.

HEILIGER: Thank you.

KENNEDY: Now there i later equipment of a Xerox type which I think was jointly developed partly in collaboration with the Bell Labs. I don' w if that is commonly available.

RICKERT: Mr. Kennedy, this is John Rick rt. I ould like to ask you a question. It seems t you have had considerable operation of the t a d the tele-reference services. Are detai lesc iptions of these available? If the bugs re ork d out of those, they might be used for other syst ns.

KENNEDY: Well, certainly the Cornet syste r. Edwards can tell you about because that is ju a corporate telephone system and I guess just essentially shares the characteristics of most private te ephone networks including the limited number of digits to be touch-toned or dialed, etc. That's a standard operating system, isn't that so, J.C.?

EDWARDS: Bob, I'm not familiar in detail with the Cornet system by that particular name.

KENNEDY: Well, I think you would probably agree that this is a standard operating telephone system which just happens to link Bell Labs, Western and A.T.&T. locations in a very effective way. As for the telereference system, this is a standard telephone message recording system so there have been no bugs to work out. It just worked from the day it was put in. Did I answer this question properly?

RICKERT: Yes, thank you.

KENNEDY: Any other questions before I say a little bit about the computer operations? On the computer side, I don't claim we're doing too much which is novel or exciting and I expect many of the gentlemen and possibly the two ladies sitting in the room are immersed as deeply or more deeply than we are in computerized information systems. At present, there are twenty-five to thirty different services or products in our library network which are sufficiently

computer dependent to be essentially irreversible in direction. Perhaps one of the ones that has had some attention in the public world within the last year or so is our -- for us our first -- on-line real-time library transaction network coupling three of our libraries to a central computer with two terminals with each of those three libraries. The system is called BELLREL, and handles the circulation or loan operations in a library. In addition, a significant range of questions may be asked about information resources. I think some of the people in the audience must be partially familiar with this system and consequently I won't go into detail. I might just observe that one goal of the system was to call upon the virtues of the computer to get away from a very tedious and increasingly troublesome manual record-keeping system. But more than that, the idea behind it was to erect a central disc record of the resources of our major libraries. Thus, when any need arose from any user in any one of the libraries or even in libraries outside the system, the full resources of the system could automatically be brought to bear on that need, in a real-time, on-line way. Thus when a person who is in the library, or calls the library, wants a particular publication, a query is put to the system. The system identifies the holdings of that publication in the three largest libraries. It also identified immediately the status of that publication, i.e., it tells which copies are where at this particular moment in time. With this information, the person's need can be pushed through the system in sort of an airline seat reservations manner. What follows is something like this. If a copy of the requested publication is reported by the system to be available in one or more libraries, one copy is selected and then submitted to the system by keyboard or punched card reading. The transaction code used is the "Loan Cancel" (i.e. "Return") code. If all copies are out, the first copy returned anywhere is passed through the system in the same way with the same consequences. In short, BELLREL consults its stored queue of waiting requesters, charges the publication to the first one, moves the rest of the queue up, calculates the loan period and prints out the name and address of the new borrower. All the local clerk then needs to do is to stamp the loan period in the publication and address a mailing envelope. There is a great deal of such automaticity built into the system and its twenty-two on-line transactions (including 12 transactions for handling queries about

publications or borrowers). At the moment, disc records include something like 70,000 book volumes, 2700 journal titles and 19,000 man records. The system is operating on a 360-40 with 6 IBM 1050 keyboard and card reader terminals linked to the 40 by Bell System 103A Data-Sets using voice grade lines. In the last 20 months of operation, something on the order of slightly more than 400,000 real-time transactions have gone into this system so we're beginning to get a fairly good feel for its performance. Are there any questions?

GULL: Bob, this is Dake Gull.

KENNEDY: I didn't know you were in the audience.

GULL: Could you repeat those figures? I couldn't write that fast.

KENNEDY: Sure, Dake. We're just about 20 months in operation now, and we have something in excess of 400,000 on-line, real-time transactions. Now this represents much more work than that because several of these transactions handle more than one unit of information or activity at a time. For example, there is a transaction which caused books to be cancelled on return to the library and this handles five at a shot if you want. So if we had a thousand transactions of this type, it would easily be 5000 items processed through it.

GULL: Bob, how many terminals did you say?

KENNEDY: Six terminals, okay? One library served is about 33 miles from the computer and the other two are 12 miles and practically zero miles respectively.

DRESSLER: This is Byron Dressler. I'm in the Computer Center here at Kent State. You said that you were using the model 40 for this. Would you tell me what the disc equipment is for that? Do you have several 2314 disc banks?

KENNEDY: We have just one 2314 on there and I might say that the system is shared in the background mode with almost full-time batch processing. This system operates in the foreground mode under MFT.

DRESSLER: And the one 2314 proves to be all right?

KENNEDY: Yes. The library actually has a share of three different disc packs, but I think if we summed up the total space that we currently consume, or have

dedicated to , it would be on the order of 2/
plus of a standard 2314 disc pack. Two-thirds c
29 million bytes. That's at present. That mean
among other things, that our book records for t
particular purpose are rather terse. The basic
book records give on the order of, I think, 188
characters for the basic book record, with free
assignable trailers for loan and reserves in a
chaining process.

DRESSLER: Okay, thank you.

HEILIGER: Ed Heiliger again, Bob. You've got quite a data base there now of circulation information. Have you been analyzing this circulation in any way?

KENNEDY: Ed, this is one of the fundamental reasons for having the system, such as you yourself have advanced from your earlier papers. Yes, you want to use the computer to get the crews away from the tedium of rowing a boat. Get them off the oars, make bette use of human beings and all that sort of business You do want to bring the resources of the system immediately to bear on any need in a way that onl a real-time on-line set-up can. All this is impor-tant. But more -- you want to very much increase management information and feedback, to get away from seat-of-the-pants operations which we've all been afflicted with in libraries for years. That really was one of the fundamental reasons for our developing this system. I must admit this is one of the more satisfactory and pleasing aspects of the whole system -- the richness of statistical and other feedback information we're getting. For example, there comes out of this system every four days or five days a thing called the Titles In Demand List or High Activity List. This is an automatic listing by the system in classification order of all titles for which there have been a given threshold of demand exceeded. Currently this threshold is set at five. If a title has more than five people waiting for it, it is automatically placed on this list. This shows the number of copies held by each library, the number of people waiting by location including the major locations and all other locations, and the number of copies which are not available because they have been declared missing or temporarily withdrawn or something like that. Finally, it computes the ratio of people waiting divided by the number of copies. Now this list goes out to our principal librarians every Monday morning and they immediately sit down in a telephone conference. With the list before them (three major librarians in this particular case

they make decisions on what is to be bought immediately to meet need. So it has had immediate impact, Ed, on library operations from that point of view among others.

HEILIGER: That's wonderful. I'm thinking, too, of research students in library schools who want to do some original work on the use of a special library. If they had access to a data base like this, they could come up with some original materials.

KENNEDY: As a matter of fact, it is likely to happen, because we're getting a very rich multicorrelation of statistics. We've got a man working in Bell Laboratories here in New Jersey now who has done Ph.D. work in library statistics. His name is A.K. Jain. You may recall the name appeared recently in LIBRARY QUARTERLY and several EDUCOM papers. He did his doctoral dissertation at Purdue on a Statistical Study of Book Use and with that talent on board, we've got him interested in the statistical stuff we're getting out. I'm rather hopeful that he will have something of general interest to report.

HEILIGER: That's very interesting and we really appreciate your presentation. Well, thanks, Bob.

KENNEDY: Thank you, gentlemen; thank you, ladies. Goodbye.

(BREAK)

HEILIGER: This will all be transcribed later so everyone here can have a copy. Two things I would like to ask Mr. Edwards. One, what is this 11,000 system that you've got planned for this area and two, what is different about the Dataphone 50 compared to Dataphone.

EDWARDS: In response to the first question, series 11,000 is a large capacity point-to-point communications capacity which is being made available on a developmental basis to customers in eleven midwestern states. The customer has the flexibility of arranging the point-to-point capacity as he likes. In addition, a number of customers may share the capacity. Dataphone 50 service is a high-speed (50 kilobit per second) dial long distance data service between Washington, D.C., New York City, Chicago, and Los Angeles. Dataphone service is a service which allows a business machine to communicate with another similarly arranged, over the voice nationwide network, access town or across the nation.

HEILIGER: System 11,000, as I understand it, covers certain states and certain cities. It's a band across this area to the East Coast and does include Akron, Cleveland, Columbus?

EDWARDS: Yes, I believe Columbus is included. The major cities are included from the eleven-state area shown in this brochure.

HEILIGER: Something I read about it said that this was a three-year experiment. Do they look upon it as being this or an introduction of a new system?

EDWARDS: Actually, it is a method of filling an initial expressed need by larger customers and to gain additional experience during the three-year period. Should the offering prove to be one that meets the needs of many customers, I would anticipate that its use would be extended. Should another offering prove better during this period, it may be withdrawn.

HEILIGER: If there were a data base in Chicago or Detroit or Syracuse and we had the proper arrangements with whomever had the data base (to do a search of it), could System 11,000 help us?

EDWARDS: Yes, of course, providing the use and the volume of information was sufficient to make such a large system effective. Otherwise, you may want to use a smaller communication capacity.

HEILIGER: I would appreciate it if you could send me the rates for Series 11,000. I don't know whether anyone else here would want one or not. If any of you want it, I'll be glad to make a copy.

EDWARDS: I will send you several copies.

HEILIGER: What is Dataphone 50 compared to Dataphone?

EDWARDS: Dataphone 50 is a high speed, switched data communication service between Washington, New York City, Chicago and Los Angeles. It allows a customer in any of the four cities to have high speed data communication capability without subscribing to dedicated channels. Dataphone service is a service which allows a business machine to communicate with one similarly arranged over the regular network. The business machines may be a short distance apart or across the country.

HEILIGER: We have read of negotiations between the Bell System and Western Union regarding TWX. Is Bell going to give up the TWX Unit to Western Union, or what?

EDWARDS: As you have read, negotiations are continuing between Western Union and the Bell System concerning the sale of TWX service. It is contemplated that the service will be sold to Western Union.

HEILIGER: Will that affect Canadian operations too? What will the effect on Canadian operations be if TELEX and TWX are combined? Do you have any idea?

EDWARDS: I imagine that international capability will be maintained. I don't know if Bell of Canada is selling or not. I can check this question for you.

HEILIGER: The use of TELEX by Canadian libraries has been a great stimulant to interlibrary loan.

EDWARDS: And of course, similar communications around the world.

RICKERT: You mean in libraries? This is also the European?

EDWARDS: Yes.

HEILIGER: At the EDUCOM meeting at Notre Dame about two years ago, there was a lawyer from New York who was a specialist ir communications work. He was predicting that a lot of people were going to have their own microwave facilities built for them. Is this 11,000 approach an effort on the part of A.T.&T. to counteract a trend in this direction, do you think?

EDWARDS: Series 11,000 channels is a response to an indicated need by the market place. I would think that communications equipment manufacturers would also feel the same market need and would respond to it. In that sense, there is competition for this segment of the communications business.

HEILIGER: The 11,000 has just one capacity, the 60-channel capacity.

EDWARDS: Yes, but again it can be shared where the Telpak could not be shared except by those industries which were regulated by governmental agencies. For example, truckers regulated by the ICC could join together, even though they might be co petitive, and share the same Telpak system and s are the cost of it. The retail store and the grocery store could

not join together, since they are not regulated by a Federal agency. But the Series 11,000 channel will allow these people to share where they could not before. To me it appears logical that this sharing is a way to achieve benefits at a minimal cost.

HEILIGER: We have a contract with some universities of Western Canada to come up with a plan whereby the libraries of those universities can cooperate a d make use of each other's facilities through the use of computers.

EDWARDS: We talk frequently with the Bell of Canada people, but I'm not that familiar with the Canadian service. Accordingly, it would be more appropriate to ask the questions of someone there.

HEILIGER: Russ, do you think we ought to get some sort of information through him while he's here this morning?

SHANK: If we could get someone who knew something about the potential and the future and expanding channel capacity and input-output capabilities through the telephone system in Canada, yes. I don't know if there is somebody like that available. A knowledgeable person who watches over the whole country or what.

HEILIGER: If you could get us a connection with someone that could sort of summarize the Canadian picture, it would help.

EDWARDS: All right. This I think we can do. The gentleman is with Trans-Canada Bell, which I understand is an organization of all the telephone companies and the government system with the responsibility to tie together all the local systems. Let's call him and you can pose to him any questions that you might have. Would that be agreeable to everyone?

SHANK: At the University of Saskatoon, they cannot right now have computers talk to each other because the telephone company does not have the capability of tying them together. Something we can do rather easily with our phone company, they can't do at all. The University is trying to induce the telephone company, which is the provincial one owned by the government, to install a line that will handle the speed and quality of communication through computers. Unless they do, there is no recommendation we can make that computers can be linked that would be effective. I wonder what the future really is. There

is a province which is economically depressed, small population, four large cities, four towns. Will they ever have capabilities beyond standard telephone lines? I wonder if anybody knows.

EDWARDS: The gentleman we are calling is Bob Donaldson.

DONALDSON: Bob Donaldson speaking.

EDWARDS: Hello Bob, this is J.C. Edwards. You will remember that we talked a couple of days ago. I'm out at K.S.U. now, and I'm on a telelecture unit conversing with fifteen gentlemen and two very attractive ladies. We've been discussing communications technology and network usage which might be brought about from this technology as it relates to libraries. These gentlemen are very interested in the network capabilities of communications in Canada and we are hoping that you can fill us in. The Conference Chairman this morning is Ed Heiliger. I will turn the mike over to Ed now and ask him if he might guide us in the area of most interest.

DONALDSON: Fine.

HEILIGER: This is Ed Heiliger. We in the Research Center in the Library School here at Kent State University have a contract to help the university libraries of Western Canada in using computers and modern communications techniques to draw themselves closer together, so that they can make more use of each other's facilities, etc. What we would like to have from you, if you could give it to us, would be something in general about communications in Canada, particularly Western Canada, and any thoughts you might have that you think might be useful to us.

DONALDSON: Well, perhaps I can outline the background of how the telephone systems work in Western Canada. In Alberta, Saskatchewan and Manitoba, they have government-owned utilities and they serve the major parts of the provinces. I say major parts because in Alberta you have the City of Edmonton (Edmonton Telephones) serving Edmonton. There is a full connecting agreement between the City of Edmonton and the Alberta Government Telephones. In British Columbia you have the British Columbia Telephone Company, which is a privately-owned corporation. Now the services provided between the four telephone companies in the western provinces are on the basis of adjacent company-type business. This is on cross-border services between two companies and then we have an arrangement by which the Trans-Canada

Telephone System which takes over when it goes beyond more than two provinces. The Trans-Canada Telephone System is an organization which is set up on a democratic basis in that it's not a legal entity in itself. It is all the major telephone utilities in Canada working together to provide the same type of services that A.T.&T. longlines do in the United States. So, if you're dealing with something that involves the Trans-Canada Telephone System, you would be getting comparable rates, comparable service. We have some variances, just like you do in the United States, with the different companies operating internally on their intra-province rate schedules.

HEILIGER: That's very helpful. We heard some talk at an EDUCOM meeting at Notre Dame University a couple of weeks ago about the possibility of satellite communications in Canada within the next few years. Do you know anything about this?

DONALDSON: Yes, the Satellite Corporation has been established. This involves the major telephone utilities in Canada, the Canadian Pacific/Canadian National Telecommunications. This is the communications side of the two major railways in Canada. It also involves government and public participation approximately on a 1/3-1/3-1/3 basis: 1/3 telecommunication suppliers, 1/3 public participation, and 1/3 government. Now this is still very much in the planning stage, but the corporation's initial organizational moves have been completed. As far as the division of facilities or utilization of the satellite, not much has been planned that way. One of the basic reasons for the government participation and encouragement of a satellite program has been to provide TV for more remote areas of Canada. The major provider of TV service in Canada is the Canadian Broadcasting Corporation, which is a government organization. We do have a separate independent network, but it only serves the major cities in Canada, whereas the CBC has attempted to branch out into the more remote areas and it is hoped through satellite they can reach even more remote areas with both TV and radio. CBC also provides both full network French and English radio in Canada.

GULL: May I ask if you could summarize the similarities and differences between the telephone capabilities for computers and the facilities offered by Canadian National and Canadian Pacific, please?

DONALDSON: The thing is that both groups, the Trans-Canada Telephone System and the CN/CP, attempt to compete actively in virtually all areas of communications, other than basic telephone and message telegram service and provision of service for computers is numbered amongst these. Now there are some differences in services provided, but I don't think they're extensive. To summarize would be somewhat difficult. I think the best thing is just to say that I think both parties will compete actively for your business, gentlemen.

SHANK: This is Mr. Shank. I'm working with Mr. Heiliger on the Canada survey. From your comments, I wonder if there is some better long distance communications capability than short distance capability. It appears that the two campuses of the University of Saskatchewan cannot have their computers talk to each other because the phone company cannot provide them with the thought band or clean line that is required and they're trying to get the phone company to invest in one for a demonstration. You're suggesting that if we go over two or three provinces, you might be able to have the computers talk to each other.

DONALDSON: Here we're getting into an internal operation that I am not familiar with, so I cannot say what is really happening in Saskatchewan. Let us say that Trans-Canada System would be very interested in trying to provide this computer-to-computer capability and overcoming what bugs exist, but I think the individual members of Trans-Canada are just as interested in doing this.

SHANK: Would it be possible easily in the right near future, to have computers from Winnipeg and Edmonton communicate with each other over the telephone lines?

DONALDSON: You mean standard telephone?

SHANK: Well, no, any capability. Do you have any capability for this?

DONALDSON: Yes.

SHANK: But they don't have it between Regina and Saskatoon, so internally in one province they don't have the capability yet, but you can go across several province lines.

DONALDSON: I can only assume that the Saskatchewan one is only a temporary problem. You could, conceivably, in attempting a Trans-Canada type hookup, run into a temporary problem too, because of the fact that you are utilizing the same facilities. You do not have separate networks.

EDWARDS: Bob, let me pose this question. If there is a situation within a province where service cannot be provided for a number of reasons, say, technical reasons, is it possible for the local communications company to appeal to Trans-Canada to come in to supplement them with additional facilities, expertise, etc.?

DONALDSON: Of course. On that, J.C., the local company could call on Trans-Canada for expertise but as far as facilities are concerned, Trans-Canada itself does not have facilities. The facilities are provided by the individual members but coordinated by Trans-Canada. We have provided a computer-to-computer connection on a Trans-Canada basis and on an intra basis in many of the companies. If it can't be provided one way, we attempt to provide it another way.

EDWARDS: We have another question, Bob, that has arisen. You're familiar with the fact that in the United States it is contemplated that TWX service will be sold to Western Union in 1970 or 1971; does this situation exist also in Canada?

DONALDSON: No. TWX will be retained by the telephone companies. We have an agreement with Western Union for full interconnection so that any TWX customers in Canada or the United States could have his cross-country or international type communication requirements met.

EDWARDS: Well, Bob, that's about all of the questions. Let me say that we appreciate your visiting with us this morning very much. I see that it is twelve o'clock. Let us release you right on the hour, saying thank you.

DONALDSON: Fine, J.C. I would just like to add that it has been my pleasure. I hope the gentlemen appreciate that I can't give ready answers for some of the companies participating, but I can assure you that each of the companies individually are eager to cooperate.

AFTERNOON SESSION

HEILIGER: This afternoon we will discuss the Canadian project of the Kent Center for Library Studies. Russ Shank is Technical Director of the Consultant Team for the project.

SHANK: The Canadian project has been variously termed by people in the Western Canada Provinces. In our office we refer to it as the IPCUR project, IPCUR standing for Inter-provincial Committee on University Rationalization. The term rationalization in the sense that it is used in Canada has the implication of cooperation. In the three midwestern provinces in Canada, they wish to do things a little more capably to avoid duplication, to reduce costs. They are very limited in funds in at least two of the three provinces involved and this is an important element of concern for them.

IPCUR itself is composed of chief administrative officers of eight Canadian Universities: the University of Manitoba, the University of Winnipeg, Brandon University, the University of Saskatchewan with two campuses--one in Regina and one in Saskatoon--, the University of Calgary, the University of Lethbridge, and the University of Alberta.

RICKERT: This, then, covers a large area?

SHANK: Yes. Now this is all that is represented on IPCUR. In addition, IPCUR representatives have asked us to pay attention to what is going on in the libraries in British Columbia at Simon Fraser University, University of British Columbia, University of Notre Dame in Nelson and Victoria University in Victoria.

Now if you would think of the geographical spread, you begin to see already some of the influences that these campus officers have to face when trying to cooperate and trying to share resources or rationalize their activities as the case may be. It's 380 miles from Winnipeg to Regina. In flying time that is about two hours on Trans-air. It is another 500 miles from Regina to Edmonton to go to the next province, and then it is 700 miles from Edmonton to Vancouver. So to get from Winnipeg to a chief campus, you'll have to travel about 1200 miles as the crow flies--about 1600 miles by air routes. This does suggest there will be problems of communication whether it's taking faculty to students, faculty to books, books to students, books to faculty, and whether you do it by moving the people and books

physically or communicating by electronic and other means--mail, for example, bus or train--whatever it might be. There are some rather natural groupings. The University of Winnipeg and the University of Manitoba are in the same town. Brandon University, recently converted from a private school to a provincial or government supported school, is about 100 to 130 miles from Winnipeg. Brandon people do find it easy to get to Winnipeg. There is, therefore, quite a natural grouping with two towns and three schools about a hundred miles apart. Moving over to Saskatchewan--Regina and Saskatoon are about 160 miles apart. It's about a three-hour driving trip from Regina to Saskatoon, or one hour flying. Dake, perhaps you could speak to us a little about travelling between Edmonton, Calgary and Lethbridge. Edmonton is in the north, Lethbridge is about 300 miles to the south, Calgary is almost halfway between the two. Over in the southwest of British Columbia you have three schools right close to each other. Simon Fraser and University of British Columbia are on the mainland, and Victoria is across the sound on the island.

HEILIGER: You can get across to Victoria in about an hour.

SHANK: Okay. The University of Notre Dame is inland in the mountains and it is sometimes a little difficult to get to. You can see the airplane you want to get to, but you can't quite get there. Dake had the problem of travelling to Notre Dame and United Airlines held its airplane on the ramp, didn't bring it into the terminal, I guess. Then there was a discrepancy of the timetable and he was standing there waving his hands as the airplane took off about a mile or so down the runway.

GULL: The computer fouled us up, I guess. That's what maintains the airlines schedules.

SHANK: So here geographical dispersion causes a problem. There are considerable problems in financing academic enterprises in at least two of these provinces. Manitoba and Saskatchewan are relatively economically depressed. They both rely on wheat trade, and the Soviet Union has been rather slow in paying its bills for the great wheat trade between Canada and Russia. The wheat market elsewhere has been rather lackadaisical. There are perhaps no more than one million people in each of the two provinces. Alberta is different. It is a relatively wealthy province

drawing on natural gas and oil trade. British Columbia has a variety of industries, though I don't think British Columbia is as wealthy as the Alberta province. At least it doesn't seem to suffer as much as the Manitoba and Saskatchewan provinces do.

This economic matter is really quite important, particularly when it is considered that the provinces stand much more independently of each other in Canada than do the states in the United States. It is a little more difficult to get cooperation and popular agreements amongst the provinces. They tend to be nationalistic in a sense. There are other problems which we will introduce a little later.

Well, the presidents of the universities and principals of the campuses became involved in a joint examination of the possibilities for automated procedures in the various libraries that would permit the eventual linking of these libraries for more effective utilization of resources. One of its committee members wrote to Duncan Wall and asked if he would be willing to be a consultant to IPCUR as it set about examining the possibilities for automated procedures. They are interested in studies undertaken elsewhere in the world with the objective of developing systems that could be adapted to groups of libraries. They would like some advice and consultation from some knowledgeable men in automation.

The objectives of the IPCUR study are to investigate cooperative automated systems as one means of guiding collection development, as a means of increasing the sharing of the library resources and as a means of providing better library resources at the same or lower cost than could be otherwise achieved. We're to examine cooperative automated systems in relation to national computerized catalogs and other computerized services being planned by the national libraries and in relation to other campus systems and projects being planned on a regional, national or international basis. So, in other words, we are to take account of many factors when we advise the principal officers of these campuses on the directions they should go and expectations they should have from library automation.

The project, for mechanical operations, has been divided up into pieces and parts. The trips to the campuses were divided so that each of us took a province apiece, roughly speaking. Ed Heiliger went to the west British Columbia provinces to examine what they were doing in library automation. Dake Gull went to Alberta Province, as I mentioned, and

also took in Notre Dame in British Columbia. I did the University of Saskatchewan and then slipped over to Brandon, Manitoba. Duncan Wall is going to Winnipeg to get the two libraries there. Duncan doesn't get quite as much because we rely on him for input on what is going on at the national level. He was recently involved in a similar kind of work in the Province of Ontario.

We spent considerable time yesterday discussing what we had seen on our trips besides snowstorms, rainstorms, and totem poles. (Canada turned out to be the only country in which the railroad stations are further from the town than the airports. Canadian National has sold all of its downtown terminals in most of the middle provinces to real estate developers who have turned them into great shopping centers. The railroad stops in Brandon about nine miles out of town after you pass the airport. The railroad does sell you a ticket that includes limousine fare to town or out of town as the case may be.) We took time yesterday to discuss what we had seen in the way of library automation, some of the problems that were already evident in rationalization in those universities, and anything else that would influence our recommendations.

I won't summarize everything that we saw. There are some important points. I have mentioned already the difference in the economic conditions in the provinces so you can sense that there are some "have" and some "have-not" provinces. It is unfortunate, in a sense, that it works this way because in the "have-not" provinces all the schools are "have-not" schools. In other words, in Saskatchewan there is one not-very-strong campus and a weak campus that might rely on it. Saskatoon is the old campus and Regina is the new one. The two are relatively weak campuses with regard to library resources for the kind of program they are trying to support. The same is true in Manitoba. The University of Manitoba is slowly coming along but still does not have sufficient library resources to support all its graduate and undergraduate programs. It therefore doesn't become a very strong factor in supporting the University of Winnipeg and Brandon University, both which have been small colleges until recently when given university status two years ago. In order to gain access to strong resources, the Saskatchewan and Manitoba librarians must go out of the province to either the national government or to another province school. I suspect this might cause some difficulties with some of the recommendations we could make.

Brandon University has no graduate program yet, and it has a library of less than 100,000 volumes--about 91,000 volumes. The book budget is so miniscule it can hardly be seen and yet it is trying to support a full undergraduate program. The University of Saskatchewan at Regina has around 100,000 volumes on campus and a book budget that won't let it grow very rapidly. Saskatoon, after all its years of operation, has less than half a million volumes in the library. The libraries do get a little stronger as we move west, and a little larger.

There is a great reliance in all the libraries on the national library for the unification of libraries and some interlibrary loans. There is also a strong reliance on the University of British Columbia for interlibrary borrowing. The telecommunications system for library purposes is rather poorly developed in Canada; hence, some of my questions to Mr. Edwards this morning. It was interesting to hear the man from Trans-Canada say that they have all the facilities in Canada or they try to do in Canada everything they do in the United States. Also to hear him say that they have only the facilities that are provided by the local telephone company. This does mean, as was pointed out this morning, that there can be no linking of a computer from Regina to Saskatoon in order to expand computer capabilities or perhaps to go on with an automated circulation system for both campuses using the computer of only one of the campuses, because there is no telephone line that will handle this communication between the Regina and Saskatoon campuses yet. There are other frailities. If you want to have some fun, try to call the information operator at Brandon, Manitoba sometime, and see how long it takes to wake somebody up.

There are some very serious difficulties. There is a lack of what we would call rationalization at the academic level in the schools in these provinces that is an even more serious deterrent to their sharing of resources than any inability of the libraries to cooperate. Officers of the universities and faculties of the universities have as yet expressed little willingness to specialize from one campus to another in teaching certain areas. Hence, the libraries must be as general as the faculties are. There is some specialization. There is one school of architecture recently founded for the three middle provinces, in Calgary. There is one school of veterinary science, in Saskatoon. There is one school of mining engineering for the three provinces. There is a little bit of this cooperative planning with academic programs, but not much, and I believe we

w[illegible]ave to tell these people in Canada that there i[illegible]y little that library automation can do on s[illegible]of their troubles until they themselves decide t[illegible]hey can get on cooperatively at the teaching l[illegible].

[illegible]ere is not the same urgency among librarians i[illegible]ved in all of these campuses to automate. They p[illegible] automation in different priorities on their s[illegible] of things to do. I would like Ed Heiliger a [illegible] later on to give us a quick rundown on the s[illegible]s of British Columbia. In Alberta, it might a[illegible]r that the librarian of one of the campuses is a [illegible]e involved in library automation and information s[illegible]e, but it barely appears. That is evident in the c[illegible]ization for information work on his campus. T[illegible]ay pose some difficulties in operating a system a[illegible]round Canada. There are people interested on e[illegible] campus, and there are people working on automation o[illegible]st of the campuses. In Brandon, they're so s[illegible]l they're just thinking about it and in Manitoba they're just beginning to think about it. There is some weakness in the computing capability, but I think this is not a deterrent. There are IBM 360 systems of various kinds on all the campuses except perhaps Notre Dame and Brandon. I believe, Ed, you said in British Columbia they were using them. Is the University of British Columbia or Simon Fraser using the Honeywell 200 for its data processing?

HEILIGER: At the University of British Columbia, they're using the Honeywell 200 for data processing and an IBM 360[illegible]7 for research.

SHANK: In essence, there is computer capability available to these people. At the University of Brandon, they don't have a computer on campus, but the business a[illegible]irs of the institution are handled by a commercial computer in Winnipeg, and it seems it is not difficult to ship the data to Winnipeg and get the printout transferred back. The University of Manitoba has said that its computing facility would be available to Brandon University for some limited use, including library circulation and some testing of other operations in the future. There are some influences that contribute directly toward facilitating cooperation in library automation amongst the provinces.

So far, I've talked about some of the deterrents or d[illegible]fficulties they may have. A number of the ca[illegible]ses have quite similar needs. Brandon, University of W[illegible]nipeg, Regina, and perhaps the Notre Dame car[illegible]ses are small, but are growing campuses--growing as rapidly as Canadian population is growing, anyhow.

They're all equally undernourished--severely undernourished--barely able to support book collections for undergraduate training, so they face some of the same urgent needs to develop resources. There are some other compatabilities or common analogies. All use the LC classification system for classification work. This use of the same classification system means that they will have less trouble cooperating in certain cataloging and circulation routines.

They all seem to have started in, roughly speaking, the same directions in library automation for better or for worse. They are, as I said, working with the same computer facilities, though the operating systems of the computers are somewhat different. On some of these campuses, the retrospective record problem is not too big yet to be unmanageable. It would not be difficult to think of a machine readable data base for the entire University of Saskatchewan, Regina Campus or Brandon Campus.

One area that does seem to suggest need is the increase of the telecommunications capability in Canada. We've had experience with the use of machine readable data files throughout the library automation world for both processing work in libraries and to some extent for information storage and retrieval so that we should be able to show the way we've been handling machinery for data bases. We've had some experience with time-sharing modes of operations in the United States in libraries--not a great deal, but sufficient so that we could help them in the appropriate areas to time-sharing if telecommunication can be worked out. And we've had some experience with the use of data bases across the national areas so we can give them some advice in this direction.

There are some rather severe people problems in the environment that we have investigated in Canada. I have alluded to the fact that there may be problems in crossing boundary lines between the provinces. The librarians themselves are playing close to their chests, and are a little wary of each other and careful of the cooperative practices. They are all watching what may be developing at the national level. There have been a number of studies on the libraries at the national level with recommendations, none of which paid off. There are some areas for disagreement between the librarians and the principal officer of the universities as to the desirability and the feasibility of obtaining benefits of library automation. It is interesting that the chief campus officer of

Regina is from the field of science and is the one that is pushing IPCUR into an examination of library automation. The use of libraries by science people is quite different from that of the humanities and social science people. The computers have meant different and more things to scientists in their information storage and retrieval work than they have to social science and humanities people.

It is interesting also that the chief officer in IPCUR will soon step down from his job at the Regina campus to be replaced by John Archer as principal of the campus at Regina. John Archer has been librarian of McGill University among other things, and was a legislative librarian in Saskatchewan for a number of years. He will perhaps bring to the job a different view of libraries and the potential of library automation. What I'm getting at here is that, in essence, what we are facing is something quite a lot more than just a technological problem. There are economical, political, and personal conditions that may be influential in saying what should be done in library automation in Canada. I would like to leave time for both Ed and Dake to augment what I have said so let me stop here and then perhaps we can get on to some questions and comments from you all later that may help us find our way through the many problems to those elements of library automation that we should concentrate on first in order to get the most benefit from them. Ed, do you want to say something to these points?

HEILIGER: The University of British Columbia is the big university of British Columbia and, up until ten years ago, it was just about all of higher education in the province. The province is as big as California, Oregon, and Washington all put together. It is a boom area like Florida and California and there are people moving in in droves, and the place is growing very rapidly. There was a decision to decentralize higher education and Simon Fraser University was set up in 1965. They cleared off the top of a mountain, built a gorgeous campus, and began their operation, all in two years, which was quite a feat. It is well financed and growing very rapidly. It has a collection of 350,000 volumes already. The University of Victoria was formerly a junior college, then became a part of the University of British Columbia and, about ten years ago, became a full-fledged four-year college, and now gives five Ph.D. degrees. Simon Fraser gives eleven. When I asked the people at the University of British Columbia how many doctorates they gave, their only reply was, "Oh, we give them in every field." So

there is a certain superiortiy complex about UBC that you have to consider and it is a force to be reckoned with. All three universities are completely converted to the Library of Congress Classification. All three of them have systems specialists on their library staffs who are not librarians and these people have been on these campuses at least three years. They know the library situation pretty well. This has been carried further at Simon Fraser than anywhere else. One of the big divisions as the USF library is the Systems Division. Circulation and other control operations are carried out in this division. All three universities have large collection building departments so that book selection is separated from acquisitions. These collection building people are specialists in different subject fields. All three university libraries have been operating an IBM 1030 fortunate at this point in time that they have, because the 1030 will go on-line with the computer. All have 360 systems and Simon Fraser is now on-line with circulation with the 1030 system. They gave me a look at their CRT tube and could query the circulation tapes to find out what books were out, who had them out, etc. The UBC people are going on-line with acquisitions most any day. UBC hasn't touched cataloging yet. Simon Fraser and Victoria have in that they decided after getting their circulation systems going that they needed a shelflist backup for it. Simon Fraser has a very brief shelflist format for all of their 260,000 titles. The University of Victoria has a much better shelf listing. Neither of these activities appeal to the University of British Columbia. UBC decided in their serials automation, to use the cataloging form of entry. Simon Fraser didn't like that and went in their own direction on form of entry. This is a real problem. The University of Victoria want to automate its serials, but wants to do it the same way the others do it. The other two can't agree on it. The Serials head at Simon Fraser feels that the catalog form of entry is ridiculous for serials work. However, she does want to cooperate and I think this will all be worked out. So they're getting into the action in all kinds of different ways, and some of them have taken off on special jobs. There was an article in the last issue of The Journal of Library Automation on what Simon Fraser has been doing with maps. One of the librarians has its pamphlet file completely under computer control and they're adding college catalog control and annual reports of corporations control. On interlibrary loan, Simon Fraser has three full-

time clerks plus a Xerox machine in the UBC library doing nothing but Xeroxing articles and parts of books. Last year they handled 7000 requests for Xeroxing and 1000 requests for circulation of monographs. UBC doesn't mind this at all. They think this is a great arrangement. Simon Fraser says that it is affecting its acquisition policy. They're not doing certain things because they know they can rely on getting them out of the UBC collection. Now the University of Victoria is getting in on the act and it has agreed to pay Simon Fraser 10% of the cost for those three people if the Simon Fraser people on the UBC campus would handle their interlibrary loans in the same way. They feel they're getting a real bargain out of it. So here is an example of three universities that are working on some interesting things together. All three of the heads of the libraries get along very well together and meet frequently. Not only do the administrators meet, but the systems people meet and this is very important. Each is vying with each other to bring about improvement in what they're doing, but they are not a bit reluctant to give what information they have on what they are doing to their counterparts on the other campuses. I think this kind of contact between the systems people of the library staffs has interesting possibilities. At Simon Fraser, one president for about a year decided that everybody working on computer things should be on the computer center staff whether they were in the Registrar's Office, the Library, the Business Office or elsewhere. So the Acquisitions Librarian at Simon Fraser was transferred to the computer center. He did very well and he became the Assistant Director of the computer center. Then the head of the computer center took another job and he became Acting Director of the computer center. He didn't like this because he knew his limitations. When the new president came in, they got a reversal of this policy and he went back to the Library where he was put in charge of the Systems Department. The collection building people meet also and discuss their common problems. So they have all kinds of things going in British Columbia, and I don't know of anything in this country that compares with it. One of the libraries has a large music collection, around 9000 albums, that they have completely analyzed on computer tape. This data base, the maps data base, and the pamphlets data base could be useful on the other campuses. I didn't get any indication that they were making joint use of these bases, but no doubt they're thinking about it. I imagine in the prairie provinces, too, they're going to be generating data bases. I brought up the whole matter of data bases

because at the EDUCOM Annual Meeting at Notre Dame University (Indiana), they were much concerned with this. Currently, there are at least 1000 data bases of known interest to libraries around the country. They are beginning to accumulate in a few places and, when they do, the expense of it is really worrying the administration. The librarians at both the University of Georgia and Pittsburgh are trying to sell services from these data bases to help take care of the costs of subscribing to them. Some of them are very expensive and very useful.

DRESSLER: I was just wondering how many of these data bases are duplicating each other's efforts. How compatable are they? Can they retrieve information for each other?

HEILIGER: This needs to be studied. I think we're going to have more and more data bases. Use on a cooperative basis may be absolutely necessary.

DRESSLER: I mean, if it is automated, then a computer can inquire into it from remote places.

HERLING: This business of data bases I would like to know more about.

HEILIGER: Well, Kent State had a chance to get a data base that had weekly service on all of the latest information on each of the big corporations last year.

DRESSLER: This was Standard and Poor's Computron Service. It was offered to the University at quite a discount. It costs a brokerage firm $14,000 to $16,000 per year, and we could have had it for about $3600. Even at that price, some of our people threw up their hands in horror. We aren't so much interested in current information.

SHANK: Well, Dake, is there anything you could add to the show?

GULL: I thought I might supplement your observations on the political character of this effort because I think we didn't mention this too much in our talks yesterday. It came out rather slowly during my visits in Alberta that the IPCUR Committee actually was established by the premiers of three provinces. Education is a provincial responsibility there, so it is evident that this is the pressure of at least two of the three premiers for economy. Eventually, the administrators equated rationalization with economy. I endeavored where I could to reach a principal administrative

officer and actually saw two of the university presidents out of three and talked with one a little longer than the other. I saw administrative people at all three places and, after a while, I worked out this kind of a question: Was the potential thought of an automated network to accomplish university rationalization being actually thought of as a potential technological solution or as a solution for the people problem? It had become relatively clear that much of the difficulty in the minds of the administration was that the libraries were not cooperating to the fullest extent possible. I believe the librarians think they are cooperating. I think that the administrative officers agree that it may be necessary to adopt a technological solution because they can't change their library people. I'm not sure all of the administrators anticipate that adoption of a technological solution will simply shift the people problem from one place to another, from operating the manual system to operating the automated system.

Alberta is, by Canadian measurements, a wealthy province; some would claim it the wealthiest of the Canadian provinces. It abounds in oil and gas. This has brought about a larger population, a couple of million in Alberta, and that's about twice as many as in each of the other provinces. It has made the cities of Calgary and Edmonton larger and more rapidly growing than the other cities, I think, with the exception of Vancouver of course. My impression of the University of Alberta is a university of approximately, if I may say so, the same stage of development as Kent State University. It shows externally the same characteristics of a period of steady growth and then very rapid growth. There is construction all over the place, and growth of the student body, growth of the faculty, growth of the library. The University of Calgary is an off-shoot. It was the University of Alberta in Calgary, and in the last four years obtained its own name. It is approximately 45% of the size of the University of Alberta at Edmonton. The universities are a couple of hundred miles apart, connected by a high speed highway and by an air shuttle service back and forth as well as the transcontinental airlines.

Both librarians were free to admit that communications between their libraries were not the strongest. In fact, the librarian at Calgary seeks assistance more from the University of Utah at Salt Lake City, a north and south orientation rather than across Canada. The librarians in the three schools in Alberta have been overwhelmed

by the growth of their collections, of the student body, and of the monies available to them for buildings and for collections. In Edmonton, they are in the second library building and still using the old library building. The new building has been occupied for six years. It is already outgrown to the extent that the addition to the new building is practically completed and the third building is being designed on the drawing boards.

In Calgary they moved into the present building in 1963. It now holds 150% of the volumes of its designed capacity. I think this growth explains part of their reluctance to look into any form of automation. They haven't done as much in automation as they have done in British Columbia, and perhaps not as much as is being done in Saskatchewan. Nevertheless in Edmonton they have had two systems men on the staff and during the current period they are presumably putting a circulation control system on the computer. However, the first system was scrapped after two years of effort and it has taken two years to get the second system to this stage. I was not invited to look at this system which I took as pretty much a measure of caution on their part.

The systems man in Edmonton proved to be on the Calgary staff and I got the benefit of his three days of experience at Calgary when I talked to him, so he had only plans for his new job.

There is a noticeable dichotomy in the two major universities. The people with whom I spoke out of the science and technology field, including the computer people of course, were quite free in their statements that they have virtually given up on the use of libraries. Since they do not get the information they want from the university libraries, they don't use the libraries. They get their information from other sources and indeed I think this is perhaps increasingly true.

There is an organization called the Alberta Information Retrieval Association to which the scientific and technical people belong, and to which the oil and gas industries people belong. I do not have direct documentation, but talking with an official of that Association, I am under the impression that they have secured all of the major scientific and technical data bases in machine readable form and are providing this information to the membership of the Association, so they have something going for themselves up there. I am under the impression that the librarians are so hard-pressed in those universities that they are not really aware that they have lost a significant pro-

portion of their potential users. They are so overwhelmed with business anyhow, that they don't try to find out what kind of people come in the door and they don't know what people have given up as users. The computers in both Calgary and Alberta are among the stronger installations. At Calgary, they stated they were installing two 360 model 50's and one 360 model 30 and that 85 terminals had been authorized for the campus and were to be installed in less than a year.

DRESSLER: They put out quite an ambitious publication every month. I became acquainted with their computer center in 1962, and have been on their mailing list ever since. The staff at Calgary is particularly good.

GULL: I believe, if they haven't changed their relative positions in the universities of Canada, that Alberta in Edmonton, with its 360 model 67, has the most powerful computing installation of any university. In Alberta, the Department of Computing Science has extracted the books for computer science from the library and physically transported them to the department where they are putting their own on-line circulation system into experimental operation. They wanted to find out how to do this for themselves so they just moved the collection over.

At Calgary, they have conducted a study which seems to me to have done a great service to their planning operation. They have identified some eight activities within the university which they will designate as a center on information retrieval of educational technology. Ed Heiliger recognized this in a sense as the learning resources idea of Florida Atlantic and some other universities. I asked them if they were thinking of this center as a cooperative substitute for an administrative change in the structure of the university that they were not yet prepared to put together, a new administrative unit, and they said that perhaps this was actually the case. They were going all the way to set up something called educational resources to accomplish some sort of cooperation. This includes the information center where they will service and retrieve information. The university library is an equal and integral part as are the media center and the data center which they have actually separated from the information center in the computer operations.

I have a feeling that there is a group of young and energetic people there who are likely to bring something off if the money holds out and if those people stay on that campus long enough. I'm afraid, of course, that they will be individually so noticeable that

other schools will entice them away and the replacements may not all work together as well as this group. My own feeling is that this is a very unusual development at Calgary, and is one that ought to be watched for it has real potentiality. I have the feeling that the librarians are so absorbed in meeting their problems with books and people and buildings that they are not aware of the possibilities that they may lose their central position in the university as that position has been viewed in a traditional sense.

I have the impression that the University of Lethbridge has arrived in two years time at the stage that the University of Brandon achieved in perhaps 16 years. The collection is similar and about the same size. The University Library budget for the first two years was 14.8 per cent of the university's expenditures and this year has dropped back slightly to 10.8 or 9. They have had substantial support to get that library started. Lethbridge is an undergraduate university and they are only getting started. They have begun sharing quarters with a junior college library and will divide into two libraries later.

HEILIGER: I've noticed that these new universities have hired a lot of American professors. Simon Fraser has about 60% American professors and I guess the Regina campus has quite a proportion. There aren't too many American librarians in these places; nothing like the number of faculty members.

GULL: Two out of three of the librarians in these Alberta universitie are from Great Britain, and I think they have certainly demonstrated progressiveness by having shifted to Western Canada. I think, relative to Western Canada in general, they may not yet be moving with the spirit of the rest of the provinces. I think the rest of the provinces are perhaps better characterized by what happened when they tried to establish a Western Canada chapter of the American Society for Information Science. About two weeks in advance of the ASIS meeting in San Francisco, they got out 90 people in Edmonton to go to the first meeting. When you consider the distances involved, I think this is a remarkable performance. I think I ought to stop here, Russ, and see if we can answer questions.

DRESSLER: I have several questions here. First of all, in library automation how important is the feature of instant information retrieval? We were talking about retrieval of a tape system. How important is it to a library to have a system similar to an airlines

reservation desk where you can instantly find the status of circulation of a book, a status of requisition, and other instant inquiry features.

SHANK: I think it would be relatively important to have instant information from the circulation system to the people on campus. I wonder, though, how much it would be worth to someone at Brandon University at Manitoba to have instant information that a book was or was not in circulation in Edmonton. If they found it wasn't in circulation and was available to be loaned to Brandon University, they would know instantaneously but it would take four or five days to get it mailed to them. I just wonder whether it is worth the long distance electronic communication to do that.

DRESSLER: The reason I'm asking that question is that these people in Canada, in general, seem to be oriented to systems 360. It makes possible an instant inquiry system like that, but this means a number of 2314 mass storage units which are about the most expensive item they can buy: about $5500 a month, at least, here. I don't know what they cost in Canada.

GULL: Storage is expensive if you record all the volumes and much less expensive if you record only what's out in circulation.

DRESSLER: I raised that question this morning when we were talking about the technical libraries in Bell Labs and I remember he replied that their technical libraries involved about 2/3 of one 2314, which I would call very efficient use.

GULL: There are 70,000 book titles and 2000 serial titles at Lethbridge.

DRESSLER: I'm not saying they cut. They use approximately 188 characters per book. In other words, it is not much more than what you might call just a shelf listing.

GULL: You're quite right. Alberta, which is going to pass the million volume mark soon, begins to look like seven or eight discs at this point.

DRESSLER: To begin with, the systems 360 requires a commitment of probably five 120a bites of core and at least one 2314 storage unit because of the bulk of the operating systems and programs agitation. You don't just operate without it and you might as well plan on it. If you add onto that randomized storage, I think there

is another unit. The 2314 is a bank of nine dispatch. I think the nine million type dispatch. So you're getting into, say, 10,000 a month committed to mass storage here, if instant inquiry is a very important part of the system.

GULL: If you record the items which are away from their customary positions on the shelves only, you may run into this. What is your condition here? Did you have 15% off the regular position at one time in Akron and Cleveland?

ROGERS: I was just trying to think of the figures last year from Bowling Green. We had an automated IBM 357 system and I think that in the peak period we had maybe between 5 and 10 per cent of the collection in circulation.

DRESSLER: Let me ask this question then. If you're going to secure at least 75,000 a year to acquire a real-time environment from remote terminals, is it worth it? I don't know.

SHANK: These are elements I believe which a feasibility study which they hope to fund would bring out. I think it would be incumbent upon us to comment to IPCUR that this objective of providing better library services at the same or lower cost which could otherwise be achieved may be--if they think they're going to do it and someone says they can--it may be a fraud. The fact of the matter is, if a circulation system can be generated, it can be run relatively simply by one or two people on each campus. It can be founded throughout the provinces; then this would save, for example, 6500 to 6800 dollars, roughly speaking, in clerical salaries on the campus and it might be worth it to them to go into this system if they can afford the communications costs.

DRESSLER: As a non-librarian involved in this project, I think that anything you can do in data processing mode with results can certainly help. However, when it comes to these randomized files of updated inquiries, I begin to wonder. Is this so much better than picking up the phone, calling the clerk at the library, who looks through the cards and says "yes, that book is out?" It only takes her four or five minutes to do this and we can hire a lot of clerks for this price. I think there is a place for a very solid feasibility study which would probably vary from one institution to another.

SHANK: I don't think anyone knows the cost of the alternative you propose.

[illegible]: I don't think it can be known, either, because I think with the viable kind of system it would be used a great deal more than five to ten per cent. It might be used 25 per cent.

HEILIGER: When General Electric did a cost study of our situation at the University of Illinois at Chicago, this was about eight years ago, they found it was costing us 43¢ to circulate a book. It's no doubt considerably higher now and I don't think most librarians realize what their circulation costs are and they should before they make any decisions there.

DRESSLER: I have been involved in a number of feasibility studies and I continually receive suggestions that we should be strong in computerized instruction. Again, it seems a little foolish to me to install a terminal which costs more than a full professor's salary to handle about five students taking a test.

GULL: Are not the circulation systems in BC all batch processing, Ed?

HEILIGER: Simon Fraser has just gone on-line; otherwise, they are batch processed. They all print out their circulation lists daily with all of the reserves in them, including bindery and missing. This pads the file. You remember, Howard, at Florida Atlantic we decided to bring out the reserves weekly because of the volume and to bring out a list according to the ID number so that people could tell what they had out. A manual system won't offer the latter feature.

DRESSLER: Suppose you had a weekly report. I have seen such reports where the paper volume is so great that if it comes out every Thursday, nobody has had time to get through last Thursday's report. We have been talking cooperation. I may be speaking from ignorance, but I feel there is great similarity between this project and a number of management information systems at different institutions. It would be most important that each place cooperated, preparing its data to the same format recorded at the same time, and in effect a part of the system. I have the impression that we are very far from this situation with this set of institutions.

SHANK: It is, and yet there are avenues of approach that might be taken. They all catalog by LC. They could begin to get management data, for example, off the

MARC service tapes from the Library of Congress. They could record in one place the LC card numbers only for books held by the various campuses and leave out all the rest of the bibliographical data. This means that for each book maybe all you need is 20 characters at the most to get a location and an identification of a book. The standard book number could be used, or the LC classification number. The latter would be a useful thing to record in one file because it could then be analyzed by subject. They could go down through the LC classification numbers and see which books are held in the provinces and how widely they're held or where the gaps are. There are things that could be, indeed, done at the management level by extracting from each campus certain kinds of data.

DRESSLER: We have a situation here of trying to perform two tasks on a management information system for an institution whose different recording departments have been behaving much as the provincial university. I have volunteered our services to do what we can to initiate things. However, I wondered just whose responsibility this really should be.

HEILIGER: I received some comments on this at the University of British Columbia. There, the data processing center has everything organized--jobs are set up ahead of time so that they have everything scheduled as you want it every day. The computer center, however, is kind of lackadaisical about all of this, and whoever needs to make use of the computer makes use of it. It's charged for. The computer center is not oriented in the direction of providing certain things at certain times. The computer center has a much bigger computer and has more time available. Now they are going on-line in the Registrar's and Business Office, the latter taking a second look at the computer center and realizing that the computer in the computer center is going to be better for on-line things than the one in the data processing center. Suddenly, the computer center is facing up to another kind of a situation.

DRESSLER: Well, I think that's always going to be a problem, until the system has become a routine.

HEILIGER: IBM and SDC are putting together library-management systems.

RICKERT: There are functions of different kinds of libraries. The reference library would have one kind of use,

the warehouse activity another kind of use.

SHANK: It begins to make a difference whether Western Union or Bell is prevalent in Canada. The Telex system and the Western Union system that provides Standard and Poor's communication capability is a message switching facility. Bell is a signal switching system. If you can generate a system that will collect messages from all the libraries, and hold them or merge them or switch them, you might be better off than if you allowed the libraries to open up all lines and communicate data to some other library. Send short messages about books to one spot and just let it be stored there.

ROGERS: Are not any of the libraries in Canada connected to the Canadian National Union Catalog?

SHANK: They all are. The standard operating procedure at both Manitoba and Saskatchewan on interlibrary loan is to first query the National Catalog in Canada and find out where to go to get a book.

RICKERT: It seems to me that there's another problem too. That is priority of users. In other words, an undergraduate usually has a term or a period of a term to get certain information, but a man working on a research contract needs it yesterday.

GULL: In Canada, the undergraduate is eliminated from inter-library loan service. He is not privileged to use it. Now if Canada really wants to have library resources work for the benefit of the students and faculty, there has to be a basic change in philosophy and policy.

SHANK: I wonder how well an undergraduate can operate at Brandon if he needs a book for tomorrow's class and all he can find out from the assistant is that the book is available at Winnipeg or Regina or British Columbia. You must maintain at least a minimum quality library on your own campus. They seem more concerned about finding out if somebody else has got something so that if they have it we won't have to buy it. Andif this approach indeed prevails, this means that the libraries will be burdened; and it becomes very important that we examine what is happening at the University of British Columbia where extra staff is added to the UBC library (for Simon Fraser) to carry on a function for which it was not organized.

HERLING: We have a similar system in Ohio. State assistance to institutions is supporting a reference inter-library loan service at Ohio State. No library today can be completely comprehensive.

DRESSLER: One other point. Are these libraries at the larger universities maintaining programmers dedicated to the library application or just general staff of the computer center? Who does the programming?

SHANK: At the campuses I visited, their programming is done by the computer center. The systems analysis and design is done jointly. It is a variable pattern. Bringing in packages is difficult. The Regina campus is trying to bring in, as a package, an acquisitions system from Simon Fraser University, but they have to do a considerable amount of redesign of the system to fit their own dimensions. Also a lot of programming.

DRESSLER: If you try to use a program package, you have the proposition that you either have to bend your position to the system you are importing or bend the system to your organization. By that time, I think the usual experience is that it's easier to program the system yourself than to import a system and adapt it. Here, I think, is an important difference between turning this job over to a data processing center and giving it to the computer center. The computer center is not ordinarily under a production mode, is much more flexible and has a staff of varied people as analysts, systems analysts, programmers, etc. On our library application, we worked with Duncan Wall and have one programmer dedicated to the library who would be knowledgeable of the whole project.

MC ELDERRY: I work with a group of colleges in California--19, to be exact--and I think it is extremely difficult to approach automation in terms of individual effort. I think the most promising way to get at it in a hurry is to set up an appropriate cooperative structure first. I'm much more impressed with the kind of thing that was talked about by the State University of New York. The librarians there thought about it, but this was another type of organization completely separated from the regular library dealing with acquisitions and cataloging. I think there is much more hope for getting ahead that way, provided there is sufficient overall volume and activity in acquisitions in these libraries to support it. It may require a dedicated computer or a part

of it. Another thought I had on it is that I think the place to start is on this kind of thing. I think the important gain that could be realized very early would be more efficient structuring of the resources of these universities. You have to have some record of what these holdings are that you can get at quickly. I don't know in what form you should catalog this. Cards are the graphic tools that they simply check off initially to find what their common holdings are. We first started out with an overlap study to get some idea of the need for cooperative effort. What is coming about slowly in California is the arrangement they have of the optimum opportunity there because of the campuses, and this is the way it is going to be and that will be it. They've been reluctant to do that, but they have the power. They are now taking a portion of all of the library budgets for an automation effort. The idea would be a computer in the North and one in the South part of the state to be shared by these campuses. So they're beginning to get some notion of what they have jointly, and their approach has been through circulation. It's got an abbreviated shelf list with the use of Library of Congress card numbers as the way to handle them and make it available to them. That's what they have so far, and it's indicated a substantial overlap of 75% between these institutions.

HEILIGER: We were talking about overlap yesterday.

SHANK: Many libraries have been studied as far as their resources are concerned, and I have been told at least three times by three important librarians in the past decade that they have got to do a better job of inventorying their collections and planning a cooperative development, and they just don't get to it.

MC ELDERRY: There has to be a structure outside their regular work to get these people together and talk to them.

SHANK: We're running into a natural problem here. Each province is trying its best to maintain national integrity and trying to promote in the smaller campuses a feeling of well being, to give them status, etc., by turning them into university campuses, etc. At the same time, they are telling them you can't have all the resources. This is a paradox they have yet to resolve, and there aren't any indications that they are endeavoring to resolve it.

RICKERT: Isn't there a problem, really, in setting up something

like a North Central Association standard, for instance, requiring a certain number of books when actually probably 75% of this number will never be taken out of the library? When you said that there was a 75% overlap, how much would you relate to the books taken out?

HERLING: 60%.

MC ELDERRY: This would be true, but there is a lot of basic information we simply don't know. We know only in terms of what people tend to use and that would make a pretty sad collection and the factor that produces the greatest use of library material has nothing to do with the collection or the building or the staff or the faculty. The faculty makes the students read. If the use of the library is poor, that means the quality of the structuring must not be what it should be.

HERLING: There must be an optimum size of collections in the various disciplines, I think.

SHANK: There probably is, but you pick the size in number of titles. There were 55,000 volumes wanted for the new University of California campuses when they opened, in addition to 20,000 journals. It took them three or four years to decide which 55,000 volumes to buy. It takes considerable research and study in relation to the materials you are using. One great value of the library is that it has things that people haven't used for a long time when they want them.

MC ELDERRY: There was a study done for the Office of Education that looked at this question of overlap of structure as literature of scientific thesaurus suggesting this substantial push toward consensus. There are a number of studies that have been made, and if this is the case, they ought to come down to actual titles. But we don't have enough information and my feeling is that we won't have it in precise form until we approximate it. We will then have automated records that we can monitor and find out how to define it.

RICKERT: May I ask another question, then? You're going to catalog with a classification number that perhaps belongs to a category that no longer exists. How valid is your analysis going to be?

MC ELDERRY: You have to get down to the actual titles.

RICKERT: And what about getting down to titles? Is that far enough? It may be far enough for the very hard sciences, but in the social sciences I find, from the little work that I have done, that titles are almost meaningless.

MC ELDERRY: There's a whole theoretical area in the philosophy of science, history of science, that suggests a structure of literature and a leaning toward consensus. The whole function of it is to define what is pertinent and what is not. These are never going to be the same and there are no two people that are going to agree on it. But there will be things on a whole that this group will tend to set as valid and will reach a point in time. But there is a range of source material that underlines all this search endeavor that is very substantial in size. The bulk of little-used material consists of summarized reports of activities of legislatures, newspaper reports, statistical data collected currently, etc.

RICKERT: What I'm suggesting is that we need different measures of authorization.

DRESSLER: It's feasible. I'm talking about the importance. How badly do you need the book so that you know how fast to evaluate it in that respect. If you don't have to know right away, I don't think you need it on a 2314, even if it holds you up a day.

MC ELDERRY: These kinds of questions are really way down the road. We all face the same problem of making do with what we have, because nobody in the whole world could accumulate as much as could be used to keep up the programming unit.

HEILIGER: The University of Victoria and Simon Fraser University in British Columbia have avoided the cataloging problem by coming up with these brief shelf lists. They have printouts by author and title and by classification numbers, indicating to the computer what classification numbers they want grouped together for a given printout. The University of British Columbia can't go along with this. They're concerned with it, but they want to do it right and do whole cataloging; this is what most libraries are thinking about. We've been doing quite a bit of thinkin

about this type shelf list approach and perhaps building a subject index to this kind of a file--an author, title, and subject index.

HERLING: I would like to ask a question about what you said about the libraries functioning at the same or less cost.

SHANK: The presidents and principals of these campuses have objectives that they're aiming at in looking at library automation. Can library automation make a library useful in doing a number of things? They have been told that this is one of the objectives that they could very well aim at.

DEBOER: I have one question. I'm a non-librarian, also not too familiar with information systems. It seems to me that our questions today have been concentrated internally on the libraries' cataloging, circulation, computerization systems. Only obliquely did I hear any mention about what kinds of expectations the user has for this system. Byron, your MIS comment, management and information system to those of us that have fought that battle--it is darn hard to get a classification of use of the kind of information the suer wants, when he wants it, and how he wants it and, I must confess, gentlemen, that I have yet to be approached by any librarian asking me in detail what I want from the library.

SHANK: We face here the fact that it wasn't the librarians who hired us. It was the presidents and principals of universities, and this was one of the first things that came out yesterday. Dake, did you mention it, or did Duncan, that before they begin a feasibility study, they have got to find out what does the user need and how well or how poorly do they serve those needs now? They're going to start right away with the feasibility study of the Regina system without knowing common patterns of method transmission and logic relationships amongst people on campuses.

DEBOER: Copyrights and the law problem may be a solution that would do more good than an alternate computerized system.

SHANK: I do believe that our earliest recommendation will be they're ahead of themselves. They can't continue a study without knowing something more about it.

GULL: There is a series called the Annual Review of Information Science and Technology which has now completed four volumes. There is a chapter devoted to user studies which is the question you're raising. There has been a lot of experimental work done in this by people from many fields including sociology and psychology and it's my present feeling that we don't know anything about this in spite of all the investigations, and the Canadians are going to find this out as the basis for their feasibility study. They're going to have to break new ground in finding out. Does this answer your question?

MC ELDERRY: Maybe the question can't be answered.

SHANK: What they tell you is in terms of what they know about libraries and information systems. Maybe if we had a different kind of a system they would ask for something else.

DRESSLER: I think the most disheartening thing is the library non-user. Quite a few non-users have a different idea of what they want from the library. I am probably a typical non-user; I do not believe I have checked out a book since 1963.

SHANK: Why not?

HEILIGER: He's the kind of man you've got to talk to.

DRESSLER: Someone has mentioned the possibility of a computer center using the library. Most of the literature useful to the computer needs to be located close to the computer so, in effect, we have a small library of our own. However, we would be happy to accept contributions from the library.

SHANK: Now come on, be honest; do you really need all that right at hand?

DRESSLER: Well, a minimal amount of it, yes. The tables, yes.

SHANK: What if we could guarantee you a pretty good document delivery system. You know, five minutes, ten minutes, fifteen minutes.

DRESSLER: We would be glad to have it.

GULL: I prefer the General Electric policy. They put one copy in the library for general use and one in the computer center. It's easier than trying to speed up the delivery system.

HEILIGER: Well, I think we've dwelled on that enough. Some of you need to get away, I know. We want those members of our Board of Consultants that are here to go over these recommendations. We do appreciate all of you being here and we appreciate your contribution. Perhaps we can have some more sessions like this sometime in the future.

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