

Concurrent session 2C

Information use I

Chair

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INVESTIGATIONS OF THE USE OF SCIENTIFIC LITERATURE AND READING IN CLINICAL MEDICINE

Introduction

The task of the library is to provide appropriate services to meet users' needs. So far, the task is clear but hard to define in detail. To be able to make judgments and decisions the librarian must hold opinions and views on the patrons of the library. They are usually gained through experience and may not be sufficient in order to make the library effective. Therefore, investigations were made at the Central Medical Library about the library use, information-seeking pattern and reading habits of the clientele. At first, a user survey was performed to identify the user groups and their needs. The survey was complemented by smaller surveys directed by the Council of Scientific Information and Research Libraries trying to establish a more consistent pattern of library use. Finally, a special study was made among those patrons who used the library more heavily than others; the so-called user core. It is significant since its information-seeking patterns and reading habits dominate the whole library scene. The use of scientific literature is cumulative.

The techniques

The user surveys were made using questionnaires which were supplemented by direct observations. Questionnaires were handed to all patrons who came to the library during a certain period of time. Observations gave information about what individual users did in the library and thus provided an insight into the activities of the survey population in relation to what had been answered in the questionnaires. They also described activities which are not normally covered by the library statistics like browsing and the use of the card catalogues, The traffic flow was also identified.

In a special study a semi-structured interview was used. The method allows the elaboration of answers and thus a more detailed pattern is likely to emerge. It is based on the so-called focused interview; a research method, which has been intensively used in social sciences recently. The interviewed persons are known to have been involved in a particular situation, and the significant elements, processes and patterns of that situation have been analyzed and necessary hypotheses formed. Finally, the interview is focused on the subjective experiences of the persons interviewed.

The focused interview was developed to meet problems arising in communications research and its purpose is to provide a basis for the interpretation of significant effects of communication. In a structured interview, the persons interviewed are involved in the same situation, but not necessarily at the same time, and its aim is to fix attention on some specific aspects of the stimulus situation. In a semi-structured interview a theme or rather theme areas are outlined, but the questions themselves do not need to be specific.

There were three theme areas: library use, information-seeking, and reading habits. They were left very broad in order to get as much material as possible and to find the different phenomena connected with library use. Above all the subjective experiences of the persons interviewed were focused on. These interviews belong to the so-called soft methods in social sciences and they ordinarily lead the persons interviewed to be both articulate and expressive, and thus the result is a maximum yield of pertinent data.

The library setting

Central Medical Library is the national resource library in medicine and its task is to collect, organize and disseminate scientific and other information in medicine and related fields in order to advance the progress of medicine and public health. It was founded in 1965 and became operational in 1966, when the Meilahti Hospital in Helsinki was built. It belongs to the Helsinki University as an independent institution. Its holdings exceed 9 000 metres of shelving and the number of current serials is now 2 591. It is open to everybody.

The library is situated in the ground floor and basement of the University Clinic building. There are seven clinics in the same building, and seven clinics in surrounding buildings. Five institutes of basic research belonging to the medical faculty, the Helsinki Institute of Nursing and the Institute of Occupational Health are in the neighbourhood. Those institutions and clinics also have libraries, most of them small and without trained staff.

The interviews

In the user survey, which was carried in the library in 1980, it came out that the clientele consists of four groups, three of which are almost equal in size and one much smaller than the others. The three groups were either professionals: physicians, or semi- or preprofessional like medical students and nurses, and laymen who either wanted to get information about an illness they themselves or some of their relatives suffered from or assisted a physician who did not have time or opportunity to come to the library himself but sent an intermediary. The rest, c. 10% of the patrons were researchers from some other field like engineering or law. For the final interview ten patrons were selected. All were physicians, either practitioners or researchers or both. Five represented internal medicine, five other fields. In-depth--interviews were performed, each of them lasted about an hour. The interviews were tape-recorded and later typed. Therefore there are two kinds of material: recorded interviews and observations, which supplement each other. Even though all the physicians interviewed were used to speak in public, they all showed signs of tension during the recorded interview and were more relaxed afterwards.

There were interruptions in the interviews, since the physicians could be alarmed and asked to return into the clinic. One of the interviews had to be repeated because of technical reasons, and one of the persons interviewed died before the final report was written.

The results

The interviews brought up an amount of subjective experiences about library use, information-seeking and reading as expected. The teaching hospital setting gave the interviews a strong research bias, but the results can be extended into the field of clinical medicine as a whole.

Clinicians use the library mainly for keeping up to date, writing, teaching, and research. Clinical problems were secondary reasons. Of the library's serial collection 300 most important journals were selected by bibliometric methods and their latest issues are on display. Those issues are regularly scanned. It came out in the interviews that the public collections of literature have replaced the private ones almost totally: the physicians seldom subscribe any foreign medical journals. Personal copies of journals they receive only from society membership. Even though they all had personal contacts among colleagues and they regularly attended medical meetings, they considered literature a very valuable and, in fact, indispensable, source of current information. The reason was the fact that their information-seeking behaviour was in most cases characterized by exhaustive approach: they wanted to know everything on a defined question or area. Journal articles were their major source of reference but they also used Current Contents, Index Medicus, Excerpta Medica, and sometimes also computerized bibliographic services. Usually they first went to their own clinic's library and then, in order to get all the material available, came to the Central Medical Library. Some of them did it regularly, some in connection of a specific task like writing a journal article. They all had a personal file or collection of reprints which they had received from the authors. The clinicians considered the library easy to use and found there all the material they needed. They appreciated the large collection which contained all the information on a subject, or if something was missing, it could be replaced by inter-library loans. Central Medical Library provides a world-wide service to its clientele in interlending and is one of the leading interlending centres in Finland with more than 40 000 requests each year.

The clinicians' greatest problem was the fragmentation of time. Appointments, teaching and clinical duties make heavy demands on their day. Therefore they expect to find information as quickly as as possible. As to the reading in general, they told that c. 90% of their time is spent in reading. Among them were some heavy readers, who read also fiction and write themselves. They had learnt early how to read and their reading capacity was very great.

Conclusion

T.D. Wilson and D.R. Streatfield consider in their investigations of information need that this kind of a need is a subjective, relative concept with no existence outside the mind of the experiencing individual. Depending upon how relevant the need is for present or planned action or for satisfying affective needs, information need may lead to information-seeking.

On the basis of the interviews, I agree in the cases in which the information-seeking and library use is occasional. I doubt, however, that it can explain the regular use and the reading interest shown by the heavy users.

The essential factor in the use of scientific literature seems to be the personal attitude which defines the reader's approach: it can be either sufficient or exhaustive. We can talk about the person's own information profile, which can be small or large.

As an information source, printed material still is more important than other sources, since it is more reliable and easy to use.

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BIOMEDICAL INFORMATION: CONSIDERATIONS ON THE BASIS OF BASIS

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0. Introduction

"Crisis". Crisis in the Academy. Crisis in Medical Education. Crisis in Medical Practice. Crisis in Scientific Community.

Here is an overall picture conveyed by Medical and Scientific Literature.

Behind this communication lies the assertion that Information use - though referring to a single Scientific area, Biomedicine in the present case - naturally reflects existent socio-economic tendencies.

The great amount of questions and actually emerging problems in Education, Research and Medical Practice mostly derive from the continuing Information boom and its increasing weight in the Scientific Community. These questions and problems simultaneously influence Information use.

Because many of us consider these questions as peripheral to our professional scope I would like to point to some topics we should be aware of as core problems in Biomedical (and Scientific) Information use.

1. Prospects on Education

Being the root of all approaches to the usage/production of Information the Educational factor is no doubt the "basis of basis" and therefore should mean a matter of primary interest and concern for Information professionals.

Whether discussing physicians' practices, Biomedical research or Health management the Educational factor arises as well as an overall impetus for change.

1.1 The Student

All recent Medical Education Meetings stress the need to teach undergraduates a so-called "self-learning" attitude. This means that the accent shouldn't be any more on a passive information transfer nor on essentially memorizing techniques.

In an era of fast Information flow teaching of "pieces" of information as believed established knowledge can't be assured anymore.

The main role of undergraduated teaching seems now to be focused on a new concept of knowledge through good basic learning, research attitude, critical mind and pure intellectual Education.

Also from the flood of scientific Information comes the necessity of subspecialization as well as the extension of formal teaching periods leading to post-graduation on Continuing Education.

This certainly is a gratifying scenario for us Medical Librarians, Health Information specialists. These pedagogic tendencies all stress the role of problem-solving techniques and therefore highlight the practice of using all sorts of Information sources.

No doubt underuse or misuse of Information have been the basis of all our traditional User Education programmes.

Coming to this point of general theoretical accordance over an Era of active learning and "creative" Information use some problems arise the sounds of controversy.

While defending a true European Communities-wide Medical profession with equal opportunities, students' exchange programmes, etc. differences on background formation don't seem near to be solved.

Universities generally are felt as highly conservative and rigid Institutions thus constituting a strong barrier towards needed innovations.

Traditional European Faculties with Departmental Disciplines still co-exist with the new Medical Colleges curricula-integrated. (Besides that most Medical teachers are not adequately trained for teaching even by ancient, "passive" schemes!).

New Technologies were trusted (and sometimes still are) to overcome a great deal of these teaching problems. They in fact proved excellent in many situations as complementary training tools, self-evaluation aids and in many other advanced features.

They are highly appealing and effective means as long as emphasis remains on the educational process itself and is not placed on technology use instead.

This is the basis of an existing concept of "Inverse Technology" (1) which focuses first on a specific educational objective and then evaluates available technology as a means to achieve it with maximized effectiveness.

An amusing, illustrative phrase cited as Richard Clark's (2) (an expert on educational technology evaluation) states:

"The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement anymore than the truck that delivers our groceries causes changes in our nutrition".

However cases have been reported where initial interest on applying new teaching media led to real teaching systemization ...

Too many authors charge the overall inadequacy of present Academic system to the existing race for funds that ranks research as top competing priority (3). Therefore appears the actual paradox where teaching becomes the less important activity in Schools!

1.2 The Physician

Problems arising from medical practice urgently pointed to the necessity of curricula and methodological changes.

- Difficulties felt in doctor-patient interaction have urged the need of re-appraising non-technological aspects of Medical profession. Humanities - though essentially introduced in premedical education (4) - also became part of Medical Curricula. Moral and Ethical issues are now covered but a major accent is made on teaching communication skills (5; 6; 7; 8)

- Handicap in co-work practices with other Health professionals led to the importance now given to teamwork (6; 9) through learning experiences together with nurses, social workers, etc..

- As new graduates totally ignored the community where they were expected to practice focus had to be made on undergraduate teaching of Social and Preventive Medicine as well as on the introduction of several educational actions outside School. This has been obviously easier inside modern institutions, regardless of traditional requirements of research and publication (10).

- Purely academic teaching of the most advanced and costly techniques is still felt as a paradox while there exists growing pressure for efficient use and cost-containment programmes. Medical educators are urged to consider cost-effectiveness and productivity improvement. These factors are nowadays part of individual clinical decisions (11; 12).

1.3 The Researcher

As stressing competitiveness of research careers are low in their present appeal it is not surprising that "most medical research is done by people who are not medically qualified" (13). Besides better career structures the problem of training for research has been increasingly underlined, not only at undergraduate level but later on through further training programmes.

A novel issue - roused from problems of scientific "fraud" - also stress formal training in experimental design and statistical analysis so that evaluation of reported data can be assured (14).

Education for research still is a controversial topic but problems now existent in the career and Universal alert from scientific community will probably bring fast solutions.

Although currently aware of new Pedagogical Tendencies in Biomedicine, Portuguese Medical Faculties with their curricula based on separated Disciplines/Departments through 3 different teaching periods will experience heavy difficulties in a global teaching reform. This is certainly the same with many European Institutions.

However these new features already show integrated teaching experiences (at horizontal level) or specific innovations inside a precise discipline (with group techniques, problem-solving, etc.), expansion of post-graduation programmes and some other specific measures.

With such a confusing scenario implementing any globally designed user education program is obviously difficult.

Therefore Medical Librarians must be aware of new curricula tendencies and must participate in new pedagogic methods.

Medical Academic Librarians must take all forthcoming opportunities to participate in the Educational process however disconnected they appear to be. Active participation in formal actions of Medical Education is important. Because Librarians of Portuguese Medical Faculties presented a conjointed communication in a previous National Congress of Medical Education, the following one already included among its basic themes Medical Libraries as well as topics on Medical Information Science.

Interventions in Post-graduated Education are even more stimulating because most of the times students already experienced enormous Information handicaps due to a lack of preparation for studying outside any tutelary Academic structure.

As it can be understood all these educational changes provide increasing professional awareness through critical and active Information seeking attitudes from users.

(Also isn't it becoming evident that along with this, there is an increasing awareness laymen - the public - are showing both of clinical and research matters?..).

An integration of our professionals within the educational team seems important from 2 perspectives:

- . Participating gradually in all "Formation for Information" actions in Medical Curriculum
- . Collaborating in the design of new programmes

Already Educational Experts ask themselves about the future of Universities when by today's "Information Era", Information will be codified in data systems accessible to anyone, wherever.

Anyhow for the time being in Portugal as in many other countries our role in the Educational Process still can be of prime importance.

2. Topics on Biomedical Information Flow

In this section some questions that affect professionals from both sectors (Health and Information Sciences) will be raised following the same perspective by which all these matters should be understood as an essential part of our professional scope.

2.1 Performance Ranking

Scientific publications initially represented for authors the occasion to spread ideas whether essentially authoritative or innovative.

Bibliographic citations were intended to give a framework to the message altogether with the necessary weight of background scientific reliance.

These were the initial days where no other formal communication means could better reach a wide scientific community. Now that new technologies have burst in to Information flow the scenario is fastly changing in the way they affect communication patterns without nevertheless diminishing traditional scientific communication boom.

Competiveness inside the scientific professional market gradually focused on publication levels to rank performance.

Very soon the usual judgement for this kind of evaluation, merit review from the pairs, began to be considered unfair, biased and subjective. "Peer review" has been accused of many cons not the least of them coming from the fact that peers are partners of the same competition and therefore too much involved and not so open to innovation.

Focus was gradually made on the study of more objective means of measuring performance, quantitative measures of inputs and outputs of scientific research. These are globally designated as "Science Indicators" (15; 16) and have been studied by Science Policy Analysts with degrees on Statistics, Sociology, Information Science.

Whether retrospective or foresight indicators they are heavily studied in our professional literature. We should not forget that in the core of these studies were the absolutly innovative works of Eugene Garfield and Derek de Sola Price among others.

Without even mentioning the range of interesting bibliometric indicators

nowadays in application we wish to highlight the curious movement currently verified towards a sort of subjective validation of purely quantitative methods (17). Whether or not scientific authors and peers opinions have been in accordance with bibliometric data (and both cases have been reported (16; 18) science policy analysis now stress that quantitative indicators should be carefully employed. Any judgement of "impact" should therefore involve as many methods as possible.

Anyway such use of information for measure of whatever is called "merit", "quality", or "impact" has been heavily criticised and very much feared among academic and research community (19; 20).

However bibliometric applications - which can be centered not only on scientific authors, articles, journals but also on academic departments, universities, nations and so on - go on being increasingly used for scientific performance measurements.

In Portugal it was the scientific community itself through the Association of Science and Technology for Development which launched a bibliometric study on National Productivity in 2 scientific areas with the global aim of obtaining a profile of National Scientific and Technological systems and thus promote all policies considered to be necessary. (Preliminary results have already been published (21).

2.2 Fraud and Bias

Fraud has been a "hot subject" on many scientific publications lately and its "importance" directly relates to the previously cited pressures to publish.

What really hurts Editors, Information Scientists is the sort of 2 blade instrument placed within our hands: aiming at scientific exactness and yet best partner for fraud.

Besides response to fraud its prevention issues a series of measures (22) with obvious incidence on research process itself (14; 23) but also related with scientific publishing (24;25) and thus Information flow.

Were there not the feeling of danger and involvement wouldn't all major science journals (Nature, Science, Current Contents, etc.) have dedicated Editorials and original papers to this problem (for instance: Nature's well known issue of 15th Jan. 1987).

Exact replication in Biological and Medical Sciences is often difficult therefore most results are expected to be reported without suspicion. Over-specialisation - outcoming from post-graduate education - is expected to be an increasing contribution to propagation of scientific errors.

In what refers to non-fraudulent papers we still have to admit scientific persuasion issued through citation bias (26). This should also deserve careful consideration once these cases exist much more currently than true fraudulent cases. It is most frequent for authors to cite extracts of papers coming to distort their global meaning. Also frequent are publications with alternative views being largely ignored to serve an author's purpose.

Indeed though many people analysed the mechanisms and causes of citation, causes for non-citation have been less considered. The reasons why an author does not provide a link to other related documents may be "innocent" (not relevant, not known, not obtainable, etc.) but may be heavily biased too.

I think this is a logic consequence of our so-called Information age where a major part of scientific "knowledge" just became a piece of Information subject to rapid change (addition, correction, rejection).

Although new Information Technologies undoubtedly bring together scientists from any part of the world, it is nevertheless true that informal routes of Information supply still are the more effective and fast for scientific communication purposes.

"Gatekeepers" and "Invisible Colleges" still being the spring of advanced scientific knowledge consequently contribute to the natural maintenance of "citation cartels" (16). Thus biased information is bound to remain even when there is no intentional purpose on it.

When peers accept fraudulent or just biased data, when databases produce internationally biased citation rates, the most obvious consequence is that Information Scientists will be disseminating these effects.

2.3 New Technologies as Information Barriers

The impact of New Technologies on Information is overstudied and oversettled. There seems to be no matter of discussion. So, what will be here referred are some aspects that should be considered when analysing the scientific community as a whole or Science as a "global enterprise" (Garfield)

For instance the role of Automated Indexes on bibliometric studies is generally recognized. Citation analyses appear to be objective measures that can be used in an international science-production analysis.

Nevertheless Less Developed Countries ♦ have little amount of primary journals indexed by these organizations out of questionable quality criteria.

♦ As this is an European Congress we shall not speak of "Third World" but of Less Developed or Peripheral Countries, though some of the situations described for the former could be applicable to the latter.

Undercited National Literatures are the general consequence of this, proving "That social factors, both internal and external to the Science system, play an important role in shaping citation patterns in Science" (27). (Science Citation Index with all its weight has been admitted to be strongly anglo-american biased.)

Coming from a Less Developed Country I fear the year of 1992 when Portuguese physicians will be involved in full-concurrence with such ranking inequalities.

The burst of utilization of New Technologies for Information Transfer is generating many supports that cannot be equally accessed in Less Developed Countries, thus joining new Information barriers to those already existent without these Technologies (for instance access to primary and secondary literature (28)).

In a study on "Socioeconomic Conditions related to Information Activity in Less Developed Countries" (29), Eres analysed 80 Less Developed Countries, 9 of which from Europe and concluded of the existence of 3 dimensions of Information activity (Written Communications, Technology and Libraries) that were found to be uncorrelated with each other. But "this study also shows that the Gross Economy of a country affects all three dimension of Information activity".

A much discussed forecast of the impact of New Information Technologies is the advent of a non-users era. The balance towards personalized, home delivered end-user products will inevitably diminish our traditional services usage.

But it also can lead to another reason of non-user increasing rate: the fact that some people will not be able to pay for those services (30). Hasn't it be said that "the major Commercial thrust behind the cult of Information is to sell computers"? (Daniel Boorstin, cited by Swan (31)).

3. Conclusions

Competition is spreading from "local" to "European" basis.

Equality in job access will unfortunately bring to light enormous background inequalities.

They are Information-conditioned and have their roots in what has been called "The basis of Basis" (The Educational factor; new patterns of Scientific judgement).

Librarians, Information Specialists shouldn't be just "disseminators" of what is too often BIAS, but play an active role in the sense of correction those inequalities.

- By participating in the design of new Medical Education programmes.

The new concept of "teaching for life-long learning" - meaning the individual's ability to be adequately informed through self-orienting methodologies - can be the key to diminish International Education inequalities.

- By being alert and alerting users to fraud (which is obviously easier whenever the librarian is also a subject specialist) mainly through requirements of publishing structured guidelines.

- By being alert and alerting to International bias in database-produced citation rates. Being aware of these cons can sometimes reduce blind use of numeric data when International competition is the matter.

In the way all these (and many other) Information topics are involving and conditioning our users we should be constantly alert to them.

These are times of controversy and paradox.

The changing scenario where Health Information users move, brings no doubt challenging foresights for our own profession.

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The Ultimate Phase of Information:
the problem of reception

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Scholars and scientists need to be informed and the librarian or information officer would like to keep them informed. But information is not knowledge. Only part of the information received will be absorbed and be made part of the user's knowledge. In order to be able to absorb as much as possible the user must be provided not only with relevant but with pertinent information and he must receive condensed and easy to read information.

Information which can easily be made part of one's awareness may be obtained in one of two ways:

1. The researcher familiar with information retrieval methods does the search himself, or
2. The librarian-information officer, an expert in both retrieval techniques and the subject field makes the search.

For information to be stored in one's mind without risk of loss, the information user must allocate sufficient time to the reading a number of adequate primary source materials. Provided he has got the time, he will read a large range of documents (anything from specialized literature to interdisciplinary) with a view to encountering unexpected, heuristic information which will stimulate his thinking.

Most practitioners and some research workers just do not have the time or the access to the appropriate type of literature, or are simply unaware of their existence.

One of the shortcomings of library and information systems is that even the best designed databases and librarians with all the know-how, searching skills and information resources tend to supply too much information to be useful to the user and the client is likely to be "desensitised" on receiving a lot of "noise" in addition to useful information.

The user will sometimes not receive precisely what he wants; he gets a lot of quasi-information which, though not quite irrelevant for him, is of less importance; he gets too much non-relevant, non-pertinent information or again he does not get the information he wants in the form that is most useful to him.

It is well-known complaint of librarians that no matter how hard they try their prospective readers would use little or no information offered in the documents obtained and processed by the librarian. Librarians do not include here those "hidden non-users" who ask for and get the information they request without ever getting down to reading it. and those who hoard information for prestige reasons.

The user with a real information need often will not go to the library because

- he has not got the time
- he does not trust the library's services
- he finds it difficult to identify and locate what he is after, though he would be reluctant to admit that.

The more outspoken would say that every day they would with determination lay aside some documents of interest which they will come back to later, but that time seems to elude them. As the stack of books to be read at a later date grows so their conscience is troubled about the backlog and they give up altogether.

How can one get around that problem?

The information officer should supply the user with and only with the information he wants at that very moment. But in order to be able to do that, he must be well aware of the objective of the research, its current status and problems, the scientist's career, publications, working methods and goals.

The information officer can only be fully familiar with the field if he is a member of the research project team or, if he is not formally included, he has been told everything about the purpose and contents of the project and his professional skills are trusted.

In these cases the advantages of informal information may be utilized and you can get full selectivity, theme- and person-oriented information as well as a fast response time and immediate feedback. A good example of that kind of work is the use of a customized PC-based small information system now more frequently found in libraries. The librarian would write the software and the thesaurus file and the scientists would continuously read the documents they share and if they find something suitable they would index it for the librarian to add the item to the computer file. With that operation the scientists will become aware of the information

they have at their disposal, whileby selecting them according to their personal needs they contribute to the building of a small local retrieval system. As time passes they are apt to forget about the original document, but when they interrogate the files they can recall information previously selected for storage. But by now associations of ideas may be different, however, and the information has become knowledge in the meantime. Such a small local system is used in addition to large foreign data bases in the library of the Pharmaceutical Faculty of the Szentgyorgi Albert University of Medicine in Szeged, Hungary.

It is not only the scientist who can involve the librarian in processing the literature, but the librarian may also decide to teach the user the methods of extracting information from documents. In our age of computerized information retrieval systems more and more scientists can use online searches and many universities run courses in the field.

Some say that though the number of end-users is growing, an also growing number of people decide to turn to professional information searchers and they do not venture to query the files themselves.

After completing a course on a system, end-users first are generally very keen on using the data bases but their enthusiasm is likely to decline. One of the reasons is that many users do not have a steady requirement that would justify regular searches. However, the number of data-bases is increasing, a lot of new software releases appear and the user tends to lose interest in keeping up-to-date with his search strategies. Besides, with large research institutes there are really professional information scientists and it is easier to let them do the job. Finally, most professional research workers consider their own professional research work more important, and if they cannot do online searches with ease, they would just not bother.

The value of information does not lie in itself but in the impact that it makes on the user, the extent to which it is capable of inducing a change or growth in knowledge creation or the reduction of uncertainty. A good example of efficient strategies for interrogating the literature is seen with the Japanese scientists who:

- want to make sure they know what the demand is for;
- analyze the requirement for information;
- check the relationships of the various factors in the request;
- will locate the source documents;
- will analyze the documents in terms of the search profile;
- will put down the findings;
- will draw conclusions;
- will write a report to provide an interpretation of the retrieval hits in a condensed and manageable form.

Another approach is to set up an intelligent information system or to link up with one (such as a decision support or diagnostic system) and do the search there.

The sequence of operation would be as follows:

- arrange a large amount of data in terms of relative importance
- extract necessary data from sorted data by using logical methodology
- evaluate whether the items are true or false, whether they are to be taken for granted, are uncertain or make no sense.
- the final stage is to put the information into an easily digestible form.

For some scientists a bibliography of a relevant field would suffice. It is of more help if he can be equipped with a report summary or a review study (sometimes called a team study or a trend study). In the analytical processing of your documents (abstracts, digests) you are more likely to end up with a mosaic-like picture in contrast to a more holistic one produced by synthesis, by an overall report.

Let me remind you of a basic piece of knowledge regarding synthesis: we must be aware of the user's pre-search knowledge because that is what we want to extend or make more accurate or combine with new associations. Some say that we even need information exterior to the contents of the documents. Just as a good translator will need extralinguistic and out-of-context information on top of the skills needed to translate sentence by sentence and word for word when he is required to translate a paper. He must know the author and the setting in which his potential readers operate. That is how he can convey the message and the sense of the author in the target language.

The review is such a synthesised body of text which refers to an issue for a certain period of time, produced after selecting and screening the information from the source documents for the purpose of highlighting it and giving it a new shape.

A good example of shaping information is the so-called "consolidated information". The term was first used by Saracevic Tefko, though he was advocating it for use in connection with information to be provided for certain groups of developing countries.

The stages of producing consolidated information:

- An analysis of demand;
- Exploring the requirements;
- Selecting the terms inherent in the documents;
- Analysis and synthesis;
- Evaluation and re-editing;
- Packaging;
- Repackaging to suit each group of different users;
- Communicating in intelligible form.

Though it is true that consolidated information is meant for use in some groups of developing countries, the relevant documents are condensed and packaged so that certain groups could receive the information they need in a form that is directly usable for their work, but, *mutatis mutandis*, I think that the very same method is applicable with advanced research teams as well.

Our point is perhaps well illustrated by the sayings "beauty lies in the eye of the beholder" and "in the transmission of information the recipient is the person who creates its very substance".

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Concurrent session 2D

Medical libraries: case studies

Chair

A. Brisoire de Belmonte

DIFFERENTIATION OF BIOMEDICAL INFORMATION DEMANDS IN A SCIENTIFIC RESEARCH INSTITUTE

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The study concerning user characteristics and their information requirements was carried out for a number of purposes: to verify Library services and possible gaps, to correct any incorrect attitudes, and to identify new methods of development, in order to offer adequate information services.

SEARCH ENVIRONMENT

The study was carried out in a Scientific Institute (IRCCS), which carries out biomedical research and clinical studies. The National Institute for Research on Cancer (IST), in particular, carries out work on clinical and experimental Oncology, conducting basic research, prevention, diagnosis, care and rehabilitation, in cooperation with national and international Institutions. IST operates in cooperation with the Clinical and Experimental Oncology Institute of the University of Genoa, with a consequent development of teaching activities. The Institute organization includes General (administrative, scientific, hygiene-organizational) Experimental and Clinical Services, managed by the Scientific Direction.

Among the Scientific Services there are the Library and the Scientific Information and Documentation Service (SIDS). The study was carried out in order to verify their organization and efficiency. They offer the following services:

- "Reference" (287 subscriptions to scientific journals, of which 215 currently active; about 2600 books)
- "Document Supply Available Outside" (about 1000 scientific articles requested per year, 25% of which are for external users)
- "Journals Indexes Photocopies" (30 weekly lists active)
- "New Acquisition Bulletin" (quarterly)
- "Retrospective Bibliographic Searches" (about 400 searches per year of which 34% are for external users)
- "Selective Dissemination of Information-SDI" (52 current SDI active, of which 15% are for external users).

Users are graduate scientific staff, technicians, nurses, students and scientific personnel from outside the Institute, who come from public or private organizations (LDH, University, Industry, Commune, Region, Pharmaceutical Firms etc.).

SEARCH METHOD

In order to collect data and, as literature on the subject suggests, the questionnaire was chosen as a search method. The questionnaire was considered more objective and more suitable than other methods, such as interviewing, for several reasons: the possibility of remaining anonymous; the possibility of reaching a lot of people in different places; the lack of influence by the interviewer on the person being questioned. In accordance with literature reports, the structure of the questionnaire was carefully studied, in order to make it simple, understandable, short, etc. The questionnaire was structured in four distinct parts: general characteristics of the users, general information services, Library and SIDS services. Some "objective answer" questions were inserted, and in some cases the possibility of making new proposals or suggestions was offered. In these cases, as has already been stated, the user could remain anonymous.

Finally, the questionnaire for users from outside the Institute had some differences peculiar to it, since these users have particular characteristics.

RESULTS, DISCUSSION

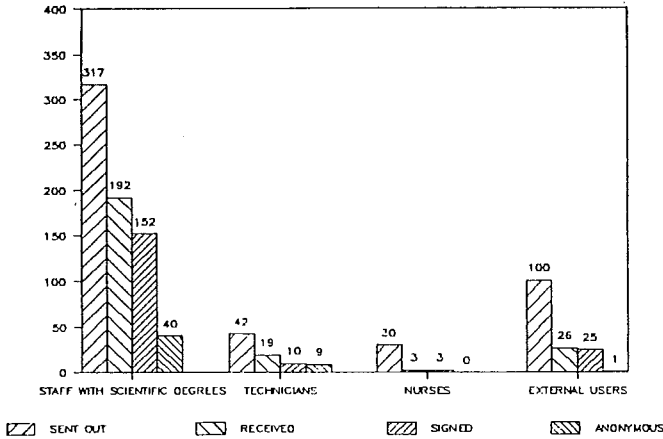
The most satisfactory and interesting data were elaborated and reported in detail in the Tables and Figures which follow.

-Common data. It is possible to notice (Fig.1) a relatively small percentage of responses in each identifiable class; a possible explanation for this could be that IST does not yet present services and staffs arranged in a permanent order and consequently its "temporary staff" (39%) might have never received the questionnaire because this group has no definite location, but shifts from one service to another.

An interesting aspect of the data is the low percentage of replies among the nurses; this data is

justified according to the Italian Health Services, since the nursing staff shows the lowest degree of sensitization where informational matter is concerned. The statistical data of this class are not significant and will therefore not be reported later on. The low percentage of external users justifies itself, because this staff takes advantage of services only at certain intervals and moreover with a lesser involvement regarding the management problems of documentation, since this last class does not belong to the Institute which carried out this investigation.

Fig. 1 - Replies to the questionnaire



-Users characteristics. The first part of the questionnaire provided information regarding the status of the user (head physician, laboratory assistant, technician, etc.) and the user's clinical or experimental working area. In an overall sense, the questionnaire responses for clinical and experimental staff presented a uniformity in the replies; this may be due, within an IRCCS, to the common objective of trying to develop scientific knowledge.

-Value of information requirements. It is possible to note (Tab.1) that for all classes, the Library represents the main source of information and is highly valued by its users; another important informative source results from the exchange of scientific information resulting from meetings with colleagues and experts within the same field. This confirms the importance of such informal meetings, a fact accentuated by the opportunities which IST provides to its personnel for participation in national and international medical congresses and foreign studies and collaboration.

Tab.1 - Use of information sources

Informative Sources	Staff with Scientific Degrees (%)	Technicians (%)	External Personnel (%)
Library	191 99.5	19 100	26 100
National and International Data Bases (SIOS)	128 66.6	7 36.9	17 65.4
Personally owned scientific journals and books	144 75.0	14 73.7	20 77.0
Non official relationships	60 31.3	3 15.8	6 23.0
Contacts with Professional Associations	39 20.3	3 15.8	4 15.4
Contacts with experts	157 81.8	14 73.7	16 61.5
Meetings and contacts with colleagues	173 90.1	16 84.2	22 84.6

Information derived from one's own books and scientific journals constitutes an important aspect; it has been confirmed that, for the researcher, this last alternative source represents a fundamentally indispensable resource, although it is possible to have access to the Library 24 hours a day (the Library in fact is supplied with a special control system when its staff is absent); moreover, by purchasing material on one's own, it is possible to cover areas of personal interest.

SIDS is another alternative source of scientific information utilized by many users. Access to this service is less direct, since the on-line bibliographic research service is more filtered and requires a more specialized staff.

-Services. It was decided to analyse the users' perceptions in detail only regarding three distinct Library services that awakened our particular interest. The respondents were presented with five categories of stock assessment, ranging from a high to a low degree of usefulness; the overall situation may be judged in Tab.2.

Tab.2 - Some informative services: utility

Informative Services	Users	High %	Good %	Low/Usefulness %	Unknown %	No view %	Utility Classification (1 - 3)*	Total
Document Supply Available Outside	Staff with Scientific Degrees (tot)	103	63	14	—	12	1	192
		57.2	35.0	7.8		6.3		
	- Scientific Managers	8	5	5	—	1	1	19
		44.4	27.8	27.8		5.3		
	- Others	95	58	9	—	11	1	173
		58.6	35.8	5.6		6.3		
	- Technicians	9	5	2	—	3	1	19
		56.3	31.2	12.5		15.8		
	- External staff	16	5	—	—	5	—	26
		76.2	23.8			19.2		
Journal Indexes Photocopies	Staff with Scientific Degrees (tot)	60	94	25	1	12	2	192
		33.5	52.5	14.0	0.5	6.3		
	- Scientific Managers	12	3	3	1	—	1	19
		66.6	16.7	16.7	5.3			
	- Others	48	91	22	—	12	2	173
		29.8	56.5	13.7		7.0		
- Technicians	10	5	—	—	4	2	19	
	67.6	33.3			21.0			
New Acquisitions Bulletin	Staff with Scientific Degrees (tot)	43	111	22	2	14	3	192
		24.4	63.1	12.5	1.0	7.3		
	- Scientific Managers	5	7	7	—	—	2	19
		26.3	36.8	36.8				
	- Others	38	104	15	2	14	3	173
	24.2	66.2	9.6	1.2	8.1			
- Technicians	5	9	2	—	3	2	19	
	31.3	56.2	12.5		15.8			

*1= more useful; 3= less useful

In this Table we can, in general, find a high percentage of usefulness with regard to "Document Supply Available Outside" in concordance with the many difficulties encountered by the users (for example, admission to other Libraries, as well as access to a collective catalogue). External users consider this service extremely useful, because for them it is considerably difficult to find and obtain the required article. These users stress the importance and the use of this service, whose costs are moreover esteemed to be good (Tab.3).

Some replies were rather surprising; in fact, a positive approval of the "Journal Indexes Photocopies" and the "New Acquisition Bulletin" did not result as expected. By examining the replies of scientific

Tab.3 - Document Supply Available Outside: analysis

Users	supply time						costs						administrative details													
	v		e		r		s		u		n		c		o		n		o		o		o			
	g	g	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o		
Staff with Scientific Degrees	12	52	82	14	2	30	192	7.5	32.5	51.2	8.8	1	15.6	h	g	v	e	c	w	l	i	a	u	t		
Technicians	2	6	6	—	—	5	19	14.2	42.9	42.9	—	—	26.3	g	o	o	l	e	s	t	e	—	—	—		
External staff	—	14	7	—	—	5	26	—	66.7	33.3	—	—	19.2	h	d	w	x	y	t	w	—	—	—	—		
														4	18	—	4	17	3	6	18.2	81.8	15.4	85.0	15.0	23.1

managers, at least in the case of the "Journal Indexes Photocopies" some interesting data appears: the majority of these respondents assess the stock available to them as being of a high degree of utility; the apparent contradiction in these two categories could be due to their different use; for example, it often happens that the managers do not pass on Journal indexes photocopies to their assistants and in fact there is a high percentage of "no view" position among them. With regard to the "Document Supply Available Outside" it is possible to find similar results concerning some differences in the replies; in fact there is a higher level of satisfaction for other categories when compared with scientific managers. This is probably due to the fact that the latter have more frequent contacts with Italian and foreign experts, or else because they delegate other people to perform this task.

Finally, in every class, the percentage of interest regarding the "New Acquisition Bulletin" resulted to be rather low; therefore another investigation will be necessary in order to modify or to eliminate this service.

The last two Tables concern the SIDS service (Tabs.4-5). All three categories presented statement of

Tab.4 - SIDS' services utility

SIDS' Services	Users	High (%)	Good (%)	Low/No use (%)	No view (%)	Total
Retrospective Bibliographic Researches	Staff with Scientific Degrees	146	40	3	3	192
		77.2	21.2	1.6	1.5	
	Technicians	10	6	—	3	19
		62.5	37.5	—	15.8	
	External staff	17	3	—	6	26
		85.0	15.0	—	23.1	
SDI	Staff with Scientific Degrees	133	45	5	9	192
		72.7	24.6	2.7	4.7	
	Technicians	13	2	—	4	19
		86.7	13.3	—	21.1	
	External Staff	2	2	—	22	26
		50.0	50.0	—	84.6	

positive approval of what is offered and obtainable in terms of on-line bibliographical research; in fact, this represents a useful and relatively recent instrument for acquiring a highly detailed bibliography. This interest is also due to the necessity for revision of scientific research lines; every month or every week new data is stored in the Data Bases, supplying up-to-date data to the researcher-workers. It is possible to notice a high percentage of external users having a "no view" position, probably because the respondents take advantage mainly of the Library services, and thus, the data relative to the SDI service is not significant.

Lastly, many users proposed alternative services, such as video-tapes and they furthermore suggested providing the Library with daily newspapers. This last suggestion represents a curious, but certainly non-negligible proposal.

Tab.5 - SIDS: analysys

	informations quality					times						
	s	a	t	i	o	s	a	t	i	o		
Users	e	f	u	u	n	e	f	c	n	t		
	l	c	i	i	l	c	t	a	v	t		
	l	g	t	l	l	g	t	a	v	t		
	e	o	o	i	l	e	o	o	b	i		
	n	o	r	t	t	e	n	o	r	l		
	t	d	y	y	y	w	t	d	y	e		
	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)		
Staff with Scientific Degrees	36	110	33	—	—	13	25	104	48	3	12	102
	20.1	61.5	18.4			6.8	13.9	57.7	26.7	1.7	6.2	
Technicians	2	9	6	—	—	2	1	11	3	1	3	19
	11.8	52.9	35.3			10.5	6.3	68.7	18.7	6.3	15.8	
	8	11	2	—	—	5	5	11	5	—	5	26
	38.1	52.4	9.5			19.2	23.8	52.4	23.8		19.2	
	administrative details											
	costs											
External Staff												
	6	14	1	5	15	3	8					
	28.5	66.7	4.8	19.2	83.3	16.7	30.7					

-Collections and purchases. The collection was generally considered as being suitable by a high percentage of respondents (68,3%). Unsatisfied users often lack an overall view of the Library's purpose; they would, in fact like to have highly specialized and rather particular areas which would be unjustified in a specialist Library. Other suggestions, on the other hand, displayed actual gaps which do in fact exist and these will be thus be taken into consideration in future choices.

There is a positive opinion regarding the purchasing strategy. A significant percentage (26,6%) was found of users that did not answer this question. This reflects a lack of information on the part of the

Library, which very likely has not been able to diffuse information regarding the buying policy, as well as by scientific managers that do not keep their collaborators adequately informed. The percentage of "poor opinion" of the buying policy is in this case also attributable to those users with limited and highly detailed interests.

-Various. The replies concerning the facility of use of the Library, the loan procedure, the assistance of the Library staff and the consulting hours show a common degree of satisfaction.

Opinions regarding the future introduction of an automated catalogue were also surveyed, showing interest on the part of all users.

CONCLUSIONS

The main purpose of a Library (a scientific one in this case) is to build a dynamic structure with an efficient service which fulfills its users' requirements. The Library must also supply a supportive role, in order to stimulate and to simplify the user-information relationship. It is therefore useful and necessary constantly to verify the operational efficiency of the Library and to carry out suitable modifications.

The results of our investigation can be useful for the expansion of knowledge regarding the management of any biomedical information center and user behaviour has proved to be typical and well-defined in accordance with previous literature on this subject. The same characteristics as described in a study on users by Wood in 1971 emerged from our survey: scientists and technologists want to obtain correct and complete information in the shortest possible time (and, it could be added, with the least possible trouble).

On the one hand, the results of the survey show a common satisfaction on the part of users, as was in any case previously perceived and this constitutes an incentive for improving the quality of the information services; on the other hand, the results will be helpful in identifying any possible gaps or deficiencies in these services and will be of aid in the formation of future decisions.

On the basis of the data obtained the following conclusions may be drawn:

- the Library is considered by users to supply useful and complete information; the user, however, improves his knowledge by means of informal communication, also (meetings, seminars, personal contacts and collaboration in research projects). According to the questionnaire data, users showed little interest in the "New Acquisition Bulletin", a fact which necessitates some thought.
- Easy access to the Library information services is very important and, though the Library permits total access, there are also subscriptions and separate collections, even if they are available in the Library also.
- Users believe the collection to be inadequate, in those cases where the information sought concerns a small, or particularly specialized and thus limited area; however this result could indicate a possible gap in Library stocks and it will therefore be taken into consideration.
- The knowledge regarding information services is often insufficient, particularly among users who are not scientific managers (it is not unusual to come across requests for services which already exist). This is an incentive for increasing information about the structure and the purposes of the services among the entire staff.
- The external users, as expected, showed very little interest in completing the questionnaire and only a small quantity of information was gathered. These users have no real interest in the general information system, since it concerns a specialist area (Oncology) and is aimed at a specialized and restricted group of users. External personnel is more interested in the usage of more general information services ("Document Supply Available Outside" and "Online Retrieval Services"), because no public Library supplies them within the Ligurian area. Information regarding the Services has been made available, by means of informative brochures, but the users do not seem to be fully acquainted with this information. They are in any case willing to pay for these services, due to the considerable advantages these services represent for them.

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THE BRITISH MEDICAL ASSOCIATION LIBRARY AS A RESOURCE CENTRE

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Abstract

The British Medical Association Nuffield Library provides members and users with a comprehensive library service: 30,000 books are available for loan and articles can be supplied from 1,500 sets of periodicals. In 1986 the Library was moved into new premises within BMA House and the opportunity was taken to improve services to readers by incorporating new technology and facilities. The catalogue is currently in the process of being transferred to computer-held file. The Library has developed an electronic request service so that members and library users can request book loans, photocopies, computerised literature searches and order BMA publications by electronic mail. Copies of published articles can be sent directly by facsimile transmission within a day or so, of receipt of the order. Readers are encouraged to perform their own searches in the BMA Library and Medline and an AIDS database are available on compact disc (CD-ROM).

Readers are provided with research desks fitted with computer and word-processing facilities that enable users to carry out their own searches, download the results and produce documents, articles and text which can be produced in camera-ready form using laser printer systems. Facilities are available to convert disc material into typesetting for publication. The Library is now undertaking a bibliometric study to measure accurately the services provided to its users which may lead to further important changes in the provision of services, and resources.

Introduction

The British Medical Association (BMA) is a voluntary body and is the professional association for qualified medical practitioners in the United Kingdom. It has over 76,000 members representing nearly 75% of UK doctors, and a further 6,000 are resident outside the UK.

The BMA is a trade union and negotiates with the Government on behalf of its members in all matters of pay and conditions of service. It is divided into Divisions, which deal with matters concerning general practitioners, hospital doctors, occupational health physicians, Armed Forces doctors, and other specialists. It has a very large publishing side, producing the British Medical Journal (BMJ) and 21 other specialist journals, as well as a wide range of books on medical topics. The BMA Professional, Scientific and International Affairs Division deals with medical ethics, European affairs, medical science, and the BMA Library. It provides the secretariat for several important committees, including the Board of Science and Education and Medical Ethics Committee, and regularly publishes reports and books on scientific and ethical subjects.

BMA Library

The BMA Library was founded in 1887, and provides members and users with a comprehensive library service: 30,000 books are available for loan, and articles can be supplied from its 1,500 sets of periodicals. In 1986 the Library was rejuvenated with a move to more spacious premises within the Association's Headquarters in London, and the opportunity was taken to install new technology, to enable the Library to function more effectively, and to cope with the demands of the 1990s. Importantly, the following research resources were required: computerised catalogue system; an electronic request system; an on-line computerised search service; CD-ROM search systems; personal study desks, with word-processing, computer search and desk-top publishing facilities; training courses in information technology for library users.

Computerised Catalogue

The first area to be selected for automation was the catalogue. When looking at library catalogue systems, four requirements were felt to be essential: high degree of user control over specifications for the catalogue; sophisticated and powerful on-line processing; capacity to integrate book bibliographic information with bibliographic information from other sources; inclusion of a user-friendly module suitable for infrequent users.

'CAIRS' software mounted on Microvax 2000 hardware fulfilled all of these requirements. Unlike other larger turn-key systems which we considered, CAIRS is sufficiently flexible to store and manage different collections. Only three are used currently - the main book collection, the historical collection and a test collection - although other collections may be added to the system later. The software allows us to define the most important specifications of the record structure. Because each collection is independent of the other, the number and length of the fields, the type of indexing performed on each field, and the output format of the information, have all been defined to suit the specific requirements of different resources such as books, historical books, reports or press releases.

CAIRS matches the on-line processing power of on-line databases, allowing us to use full Boolean logic on both controlled terms and free-text words, truncation, stored search profiles and potential thesaural control. We have altered our indexing to maximize the advantages of Boolean retrieval: instead of appending geographic and form-type subheadings to MeSH terms, we now include them as separate MeSH terms.

As well as being able to retrieve specifically relevant information, CAIRS software allow us considerable flexibility in formatting bibliographic information prior to dissemination. Four different output formats are used on-line: public access, short format library staff access, library housekeeping access, with circulation and accession information, and full format access for checking the full record.

This flexibility also allows us to integrate book bibliographic information with other bibliographic information. For example, the results of a search for books about adolescent alcoholism can be downloaded to a separate file, edited to remove irrelevant information, and then combined with the results of a literature search in Medline.

CAIRS uses a menu-driven access mode called SCAT. As with other parts of the catalogue, we have been able to design the dialogue of the menu, and to choose the access points offered. The user needs no prior knowledge to access the catalogue - commands are given at the bottom of the screen and help menus can be consulted at any stage. CAIRS offers exceptionally powerful retrieval functions, and with training, library staff have been able to use these functions to maximum effect and it should be ideal even for the infrequent user.

Once fully operational, we intend to circulate a New Accessions List to our member libraries, taking advantage of CAIRS capacity to search over ranges, for example, books added during the last quarter and to reformat information. The system should be available for on-line searches to both internal and external users during 1989.

Electronic Request Service

The Nuffield Library of the BMA has long served the needs of its members for book loans and photocopies and is constantly looking for ways to improve its service to the membership. However, owing to handling and postal delays, requests for photocopies can take up to three or four days. Therefore to improve the service an electronic means of communication was developed.

Although the BMA and the Nuffield Library were already users of Telecom Gold electronic mailbox service, now called Dialcom, few members of the Association were subscribers to Telecom Gold, so some other means of communication was needed. One of our Dialcom mailboxes was allocated to the system and a password was given out to members who wished to use the service. Anyone with the correct equipment, such as a dumb terminal or personal computer and modem and communication software would be able to access our system without having to be a Telecom Gold subscriber.

By using Telecom Gold's own simple 'form facility' software, 'electronic forms' could be written and displayed on the screen so that the user would simply fill in the correct details when prompted. This would allow anyone to dial into the mailbox but permit them only to do what the menu showed; viz: Request book loans; request photocopies of papers in the Nuffield Library; request computerised literature searches; order reports produced by the BMA Board of Science & Education; send messages to the BMA Library.

Non-members could also use the system but would only be eligible for part of the services displayed and would have to pay in advance by credit card.

The service has been under test for one year and has been advertised mainly to our institutional members, who are most likely to have the correct equipment to access the system. At the present time about twenty or so of our medical library members use the service. Some use it nearly every day, others weekly or on a monthly basis, with users being scattered all over the UK, from Scotland to Cornwall.

The number of photocopy requests received in this manner is small compared with those arriving by post or telephone each day, but it is increasing. Over the last two years the number of photocopied sheets of paper sent out from the Nuffield Library have increased annually by approximately 30%. We normally dispatch photocopied items by first class post. But if

requested we can send copies anywhere in the world via our facsimile transmitter. In some cases we receive requests for photocopies via the fax machine. Two common sources are the Royal College of Surgeons in Ireland and the Public Health Laboratory in Colindale, London. This is an ideal resource service which we intend to develop, as fax equipment becomes more widespread.

Computer Searches

The number of computer searches undertaken each year in the BMA Library has increased significantly as more and more users become aware of the service. There were 250 searches made in 1986, 336 in 1987 and a further 25% increase is expected during 1988. To satisfy these requests we use the host DATA-STAR, and Medline seems to give the best results for the majority of requests. However, we will use any of the 150 databases available on DATA-STAR to answer a member's request. Searches will also be performed for members even if the subject is not specific to medicine.

Members are encouraged to perform their own searches at the Nuffield Library. Enormous amounts of medical literature are now being produced, and doctors like any other scientists, need to keep up-to-date in their own speciality and this is quite time consuming. Therefore, unless they know how to carry out their own computerised literature searching they may miss items of vital importance to their patients or research programmes. The Library and Scientific Division have produced their own practical guide to medical libraries which considers search techniques in detail, and training can be provided for library users.

Compact Library - CD-ROM

Following a two week trial of Medline on compact disc (CD-ROM), the advantages of this new technology were considered to be so beneficial for readers and staff that a system was installed in the Library Reading Room and users were invited to experiment.

The system consists of a Philips CM100 player, connected to an IBM computer which uses the Cambridge Scientific Abstracts (CSA) version of Medline on CD-ROM. The subscription includes backfiles from 1982 to 1988 and also the current year. The discs for the backfiles are updated each year to take account of new subject headings and other additional features. The disc for the current year is updated every quarter, all discs are returned when a new updated disc is received.

The Medline database on CD-ROM has most of the advantages of on-line searching. Combined terms using Boolean operators enables the user to carry out a complex search and retrieve specific references within a comparatively short time, and the software provides the user with easy-to-use search capabilities enabling free text searching by word or phrase.

We are actively encouraging readers to use the system and they do not necessarily need any previous experience of on-line searching. Usually after a brief instruction from a member of the library staff, they will happily continue searching for themselves. Full help screens are available

to guide the user through his search. As there are no on-line charges involved, readers can sit and browse through the references retrieved and abstracts where given at leisure, and they can save either the whole set, or individual references, to disc for printing later. Readers have been impressed with the speed of retrieval, with the added pleasure of being able to search for themselves without having to wade through volumes of Index Medicus.

The Divisional library and research staff will also use the CD-ROM system extensively. Each year more than 250 queries for literature information, which require time consuming manual searches, are dealt with and most of these can now be carried out using CD-ROM, thus saving considerable staff time. Also most Medline searches covering years from 1982 can now be carried out using the system, thus cutting down costs to the library and therefore to the reader.

CSA are at present demonstrating new Medline software and features, amongst these is the ability to explode MeSH terms i.e. carrying out a search on a term and retrieving items indexed under all the subordinate terms in the hierarchical structure. This feature is available on on-line searching, its addition to CD-ROM will make searching more effective. Searching four discs at a time, is another feature at present being demonstrated, this would of course eliminate the need to keep changing discs thus cutting down searching time considerably.

A compact disc version of a major AIDS database was also provided in the BMA Library at the end of 1988. The CD contains references on AIDS from Medline and full texts of articles on AIDS from 8 major journals including the British Medical Journal, together with the AIDS database from the London Bureau of Hygiene and Tropical Diseases.

Personal Study Desks

An innovation new to libraries is the provision of study desks, equipped with computer terminals and communications, for the use of readers. A growing number of doctors and medical scientists are developing computer skills and are no longer content to always let the librarian carry out research for them. There are now computers in many practices, but few have the facilities to access on-line databases.

The BMA Library has proved to be an ideal study base. There are now two desks equipped with personal micro-computers with communication facilities. On-line searches can be carried out and the results downloaded to disc. The reader can then edit the results, using the word-processing software, which can also be used to compile notes, talks, articles, etc. This facility was used recently by an American professor, who worked in the BMA Library for six months writing a book on medical ethics. He was able to research and write the chapters, save them on disc, and send them to his secretary in the USA to edit on their own system.

The Scientific Secretariat, situated next to the Library is provided with high quality laser printers and readers can obtain camera-ready copy print-outs within a few minutes of final word-processing. It is also an easy matter to have the material professionally typeset from disc and printed. Such processes are often very lengthy and fairly costly. However, using the techniques described here the Division was able to produce its own textbook on how to use a medical library - publication was accomplished within a few weeks at low cost and the book has been acclaimed by doctors and librarians alike.

Electronic Information Course

During 1988 the BMA's Nuffield Library arranged four one-day courses to introduce doctors, researchers, medical library staff and medical students to 'electronic information'. This includes anything from local systems such as bulletin boards to full text world wide database systems. The basic aims and objectives of the course are: To teach the principles of electronic communication; to introduce the principal uses of remote databases and electronic mail systems; to demonstrate different computer systems, including modems and electronic information services; to teach about practical problems of electronic communication and how to overcome them.

The course is divided into two parts. The morning session introduces the participants to the various types of hardware and software required to access electronic information systems, with emphasis being put on the use of modems and communication software. An hour is set aside for practical hands-on experience of setting the modem and software correctly and accessing a few simple bulletin board systems. The afternoon session provides an introduction to databases and searching techniques. We have been fortunate to have a staff tutor from DATA STAR to do this for us, and this is very appropriate, because they are experienced in training and they are a major host who would be used by most of the participants on the course. A practical session of 45 minutes is set aside to allow people to dial into Medline or other files on DATA STAR. The course concludes with a member of Dialcom staff talking about electronic mail services. Again, a practical session is available, for accessing the Dialcom system as well as the Nuffield Library's own Electronic Request Service.

The course structure is regularly reviewed, taking account of questionnaires completed by the participants after each course. Some ideas for improvement, such as increased 'hands-on' experience time, have been made, and use of CD-ROM systems will be included in future courses.

Conclusion

The BMA Nuffield Library, which celebrated its centenary in 1987 is not old when compared with the libraries of other medical societies or even with those of some medical schools. But it is a unique library in that it has always aimed to encourage and promote library services to those members who did not have easy access to libraries close at hand. After 500 years of existence the printed word cannot be replaced overnight by high-tech equipment but the sensible provision of computerised information systems is certainly the way forward and this paper illustrates the advances accomplished in the BMA Library in only 3 or 4 years.

It is impossible to predict accurately how different medical libraries may look in the future. Artificial intelligence and expert systems may be common place, catalogues of other libraries will be on-line, interactive video systems could be routinely available, and some libraries may be geared principally to providing information using computerised and electronic means. The BMA Library has moved rapidly along this new technological learning curve and it is clear that there are obstacles to overcome which will directly affect readers, library staff, book and periodical provision and compatibility of equipment, in particular. Librarians and information

specialists need to start organising change in information systems at a simple level, learn from mistakes as well as successes and ensure that equipment compatibility is carefully planned for the long-term.

At the BMA we are now carrying out a detailed bibliometric study to measure accurately the services provided to our users including full details of every request received over a six-month period and show how the services were provided. Further important changes in our systems may therefore result.

What is important is that we continue to meet the needs of all our members and library colleagues throughout Europe and that our users continue to make full use of our resources and know how to do so properly.

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PROVISION OF ALL-ROUND LIBRARIAN AND INFORMATION SERVICES
AT THE INSTITUTE FOR CLINICAL AND EXPERIMENTAL MEDICINE IN PRAGUE

J. Hořejší, Czechoslovakia

The Institute for Clinical and Experimental Medicine (IKEM) in Prague is, with its staff of 1,100 (of this number, 132 are scientific workers, 263 graduated specialists, 580 secondary educated specialists), 14 research departments and specialized divisions and 290 beds, the largest institute of the Czechoslovak medical research structure. IKEM's scientific thrust is exemplified by the cardiovascular and transplantation research programmes, as well as by the teamwork of about 30 medical branches and the experimental, clinical and epidemiological approach to the solution of all problems.

IKEM's long-term general aims are:

- to seek the most efficient ways of making diagnosis, treatment and rehabilitation in its fields of research, or test and introduce techniques developed elsewhere, TO REDUCE MORBIDITY, DISABILITY AND MORTALITY
- to seek the most efficient ways of prevention in its fields of research, or test and apply techniques developed abroad, TO IMPROVE THE HEALTH STATE OF THE POPULATION IN GENERAL
- to contribute, by means of new knowledge and concepts in its fields of research, TO FURTHER PROGRESS OF CZECHOSLOVAK AND INTERNATIONAL MEDICAL SCIENCE.

One of IKEM's fourteen departments representing the professional and scientific basis responsible for the development of research projects is the Scientific Information Centre (SIC). The SIC was set up in 1971 (in 1976 it moved to a new building). Its multidisciplinary team of qualified specialists, using sophisticated technology, is ready to provide all-round librarian, information and other related services to IKEM's research workers - not only in their role as seekers and users but, also, as producers of information. The Centre's forty workers, of whom 13 are university graduates and 22 received their training at secondary vocational schools in the fields of librarianship and information sciences, editing and journalism, translating, computer operating, medical illustration and photography, make equal partners to scientific workers.

This philosophy, while enabling, on the one hand, narrow specialization of each of the Centre's workers and divisions, makes the whole range of services, rendered by the Centre, not only their mere total, but gives rise to a completely new quality, including the integration of information specialists, with the support of the centre's complex services, in research teams.

The four main tasks of our SIC are:

- 1) to provide direct access to primary sources of information
- 2) to help by searching of information
- 3) to collaborate by preparing publications and lectures
- 4) to inform about services provided by the SIC (in IKEM) and about IKEM's activities and accomplishments (in the Czechoslovak medical community and in population in general).

1. Procurement of primary sources of information (library)

The most important thing for every scientist is direct access to the primary sources of information. Information is the main stimulus and a raw material at the beginning, primary fuel in the course as well as the main output at the end of each endeavour. Here by the word "information" we do not mean bibliographic data and pragmatic information (know how) passed from science to practice, but actual scientific information serving the gnoseologic function of science and its "extended reproduction". The cradle and shelter of this type of information, as well as the means of its accumulation, specification and verification, are journals and other printed sources of information.

That is why a medical science library is the foundation stone of our Centre. First of all, we have to collect, store, systematically update and make accessible optimally designed, specialized collections of journals, monographs and other documents.

The Centre's reading room offers (six days a week, from morning till evening) the last two volumes of about 320 titles of journals (half local, half foreign) to be studied on the spot, of course with the availability of xeroopies of any chosen article without waiting and paying for it. The reading room is visited by some 6,000 doctors and other visitors annually obtaining more than 100,000 xeroopies instead of loans. At present we are preparing, as part of the reading room, an audiovisual study. In addition

to journals, the reading room offers also Current Contents (Life Sciences) and Index Medicus (from 1927) as well as some other sources of bibliographic information that serve both IKEM's scientists and the Centre's information specialists (see later).

In the lending office, we lend - with the help of our author and subject indexes - over 55,000 separate titles of monographs and bound journals (older than two years). During one year we provide about 30,000 loans and another 100,000 copies from bound journals instead of loans here. Why so many copies? First, scientists prefer to obtain a copy for their personal collections of documents and, secondly, the journals are permanently accessible to other readers.

Naturally, we try to have most of what could be sought for in our own Centre. Nevertheless, not even the best profiled and richest library is able to cover the whole spectrum of the necessary information sources and titles. That is the reason for operating a broad interlibrary loan service (from other Prague's libraries even by car twice a week). Of course, also requests from other libraries for material kept in our specialized collections are handled mostly by means of xerocopies - so that all the titles may remain available to IKEM's research workers at all times.

Now, a few words about automation in our library. To date, we have not deemed it necessary, with our relatively small collections, to develop a separate system for catalogization or loan registration. What is necessary, however, is a national library network with central and universally accessible indexes, catalogues and - perhaps - electronic mail. We are prepared to join and support such nationwide effort.

2 - Aid by literature (information) searching

To a creative scientist, professional assistance in this respect means a considerable contribution as it saves his/her time by retrieving the necessary literature and by its processing. To be able to meet the steadily growing number of retrieval demands and to offer always a professional and prompt answer to different queries, we have to consider thoroughly

the choice of corresponding primary and secondary sources of information as well as develop an optimal retrieving strategy. That is, what scientists and physicians look for and expects us to provide. However, to work "side by side" with the scientist in front of a terminal connected to various data-bases, it is necessary to know not only the function, language and philosophy of automated bibliographic systems, but also the subject of searching, the essence of a research problem. It's impossible to equate "scientific information" to "information science" since, to do so, besides the formal aspect; it is also necessary to know and study the information content.

Is anything like this possible at all? We hope so and try to make it a reality. It is for this reason that we participate in all activities of our Institute, in seminars, conferences and other meetings. Our information specialists have divided their scope of interest, regularly exchange their knowledge and use it to improve further all information activities. And - last but not least - we permanently study the contents of our information collections, mainly new acquisitions, as well as the products of the creative activities of our colleagues - IKEM's scientist and doctors. In this way, all journals, monographs and other documents arriving into our SCI are employed:

- to perform selective dissemination of information
- to produce an automated information bulletin with the help of IKEM's mainframe computer and its terminal network
- to build up collections of factographic data and photographs of prominent personalities, institutions and scientific meetings within IKEM's scope of interest
- to pursue our own study and continuing education.

This all, and many other activities are necessary if we want to respond to the steadily growing demands of our scientists for retrospective or running literature searching. Within one year we provide about 300 retrospective searching and the same number of running ones, with the use of both conventional bibliographic sources and modern automated systems. Here, it should be stressed again - the conditio sine qua non are not computers, but people.

One of the possibilities how to achieve the maximum effectiveness of work sharing is a direct integration of an information specialist in the research team. This integration brings some objective problems (connected e.g. with the organization of the whole information centre and its working capacities) and of great importance are also the subjective abilities and predispositions of the information specialist in question. He should be a perfect mediator between the information system and the research team and thus arise the prestige of the SIC.

In conclusion of the first two parts, I would like to emphasize that we try to be, to the Institute's scientist, the only library and information centre in the world. The yardstick of success in our effort is not only the quality and extent of our own collections and services, but also the range of sources that the Centre's staff is able to compile by conventional and electronic means from a growing variety of sources anywhere. It is, of course, nothing else than the old laws of "universal bibliographic control" (UBC) and "universal availability of publication" (UAP).

3 - Cooperation in the publishing and lecturing activities of scientists

As has been said, research workers are not only seekers and users but also producers of scientific information. It is therefore one of the duties of the Scientific Information Centre at least to keep record of their publishing and lecturing activities. This is something that our SIC has been doing ever since it was established. As it should be used also to compile bibliographies, to answer diverse inquiries and to analyse and evaluate research activities, the classic record method, no longer satisfactory, was substituted by an automated one 10 years ago.

Overall data of this registration (this means about 1,500 publications and lectures per year) reveal an impressive record of publication and lecturing activities and thus not only justify automation but, at the same time, clearly demonstrate why the SIC has to participate in the process of preparation of publications and lectures. It cooperates with the scientist

in editing the texts, in translating them into foreign languages and in providing them with graphic and photographic documentation. The services in all of these spheres are on a professional level as well because they are provided by specialists with adequate university and secondary training who have all the necessary technical equipment at hand. The aim of our SIC is not only further perfection and expansion of these services (e.g. translators also interpret at scientific sessions, a microcomputer is employed also to draw figures and charts, a videorecorder contributes to the improvement of dynamic documentation, a word processor helps in the translating department etc.) but, also, the setting up of a complex preparation line for articles and lectures.

4 - Advertising the services of the SIC and the IKEM's activities

Even research workers and novices at particular, must learn to make use of the body of scientific information available. The SIC is here again to help them also in this task. The SIC uses different forms of what one might call promotion or advertising of information and information services - it took part in a course for young scientists, developed audio-visual programmes, published printed materials and introduces new routes to get the information to scientific workers - in seminars at different IKEM's departments, by means of information request surveys and during everyday contacts by meeting and fulfilling their requests. Promotion of the SIC and its services is effected also by its own editorial activities informing IKEM's research workers as users as well as authors of scientific information items.

The fact that the SIC has a good and productive reprographic equipment as a production basis is used also for the editorial activities of the whole Institute addressing the general scientific and medical public. The most successful item is Kardio, a bulletin published for 14 years and coming out in 3,000 copies and 4 issues yearly. The organizing, editing, copying and production activity of the SIC enables the whole

medical profession to benefit from the extraordinary conditions IKEM's research workers have as regards their access to information sources (not only printed but also in the form of scientific events) completed by their own creative activity and critical evaluations. This is the case of the Transplant bulletin as well, which has been informing some 1,800 readers twice a year of the second IKEM research programme for five years. Both periodicals are distributed free of charge nationwide, like all the other publications.

One of the tasks of the SIC is also to seek to close the gap between the sphere of scientific information and the sphere of general journalistic information adressed to the broad public. That is why the SIC develops and coordinates also its own science popularization activities concerning the lines of research pursued at the Institute. This is yet another area where the Centre's editorial, photographic and graphic specialists are invited to participate. The most remarkable achievement to date in this field is the publication of "Heart against myocardial infarction" - J. Hořejší, Avicenum Prague 1986, 314 p., 20 000 copies (Physiology, Pathophysiology, Epidemiology and Clinics of Ischaemic Heart Diseases, including the principles of primary prevention).

Conclusion

The main current goal of our efforts at present is to establish a close contact (perhaps integration) between the best qualified information specialists and various research teams or branch groups. There they should represent and offer the advantages of the whole complex of professional services of the SIC and all modern information systems and activities. Permanent contact of information and research workers enables, at the same time, a permanent survey of information requests and demands as well as permanent instruction of a rational handling of information. It represents an interaction for the benefit of both partners.

We as information specialists must not forget that our work or our self-consciousness are not the ultimate goal of our endeavour. It should be aimed at rendering highly skilled and professional services (of course, not in the position of

an au-pair girl) to medical science and practice taking care of the lives and health of all of us. This is actually the ultimate goal we have to strive humbly to achieve in the best interests of us and our beloved ones - and not to seek to impose on it indiscriminately any principles of librarianship whatever the cost.