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ABSTRACT

The objective of this seminar was to increase the awareness of the importance of information to industry and the availability of informational resources in Newcastle. It is directed toward management, research and technical executives. The four papers presented for discussion are: (1) "The importance of information to industry," (2) "The mechanics of supplying information to industry," (3) "The role of government in supplying information to industry" and (4) "Information for industry, the local scene." The appendices contain: a list of participants, a list of organizations represented, and the object and members of the Industrial Library Advisory Committee. Also included are an index and a graphic picture of the cost relationships of information systems. (Author/NH)

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INFORMATION FOR INDUSTRY

Proceedings of a one day seminar held 6th December, 1971, under the sponsorship of the Newcastle City Council.

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INTRODUCTION

This seminar was arranged and sponsored by the Newcastle City Council on the advice of the Industrial Library Advisory Committee, and was held at the University of Newcastle. Its aim was to increase awareness in the importance of information to industry and the availability of informational resources in Newcastle. Accordingly it was directed at management, research and technical executives.

The chairman of the seminar was the Right Worshipful the Lord Mayor of Newcastle, Alderman D.G. McDougall, C.B.E..
The four speakers and discussion leaders were:

H.W. Hosking, A.S.T.C., M.Sc., Ph.D., Research Consultant, Broken Hill Proprietary Co. Ltd.

H.W. Groenewegen, B.A., Dip.Lib., A.L.A.A., Librarian, Australian Atomic Energy Commission Research Establishment.

G.D. Richardson, O.B.E., M.A., F.L.A.A., Principal Librarian, The Library of New South Wales.

R.B. Martin, A.L.A.A., Chief Librarian and Information Officer, John Lysaght (Australia) Ltd.

The Council records its appreciation of the services of the Industrial Library Advisory Committee, the four speakers, the other participants, and the University of Newcastle.

OPENING OF THE SEMINAR

The seminar was opened at 9.40 a.m. by the Chairman, Alderman D.G. McDougall. In his remarks he welcomed the delegates, especially the four speakers, and referred to Newcastle's interest in industry which had led to the establishment of the Industrial Library Advisory Committee and to the holding of this seminar. He expressed the wish that all present would learn something of value, that further cooperation would be achieved, and that the seminar would be so successful as to warrant repetition at a later date.

THE IMPORTANCE OF INFORMATION TO INDUSTRY.

by Dr H.W. Hosking, Research Consultant,
Broken Hill Proprietary Co. Ltd

1. Definition

My brief is to discuss the importance of information to industry. Before developing this theme I think it would be advisable to take a little time to clarify just what sort of information we are talking about.

Industry has need of, and uses, many types of information. There is a large, continuously tapped source in the expertise of its professional, technical and commercial staff. Day to day operations also involve the use of a regular flow of data from, and to, production centres. At management levels, decisions are made on the basis of information generated by financial, marketing, exploration, engineering, production, forecasting and research activities. The shuttles in the loom of this activity are the reports, directives and statements of policy and objectives which travel to and fro within the developing fabric. Their function is to ensure that decision makers have available to them at all times, the material necessary to the making of the best decisions. This is a very important function because bad decisions are expensive in terms of money, time and frustration. To a large extent industry tends to regard this material as its basic information supply. For our purposes we may designate it as the 'primary' or 'direct' source.

When librarians, scientists and other professionals talk, as we are talking today, about 'Information Retrieval' in a conventional sense, they often have in mind that broad body of recorded knowledge generally referred to as 'the literature'. From it, required items can be recovered by tracing references

to the journals or other vehicles in which they are contained. As this literature is not generated, in the main, by the companies using it, but forms a backing to the expertise of staff, it may be designated, for convenience, as the 'secondary' or 'indirect' source.

It would be unrealistic to consider the information needs of industry without giving attention to the treatment of both types.

From this viewpoint then, the literature which constitutes the feed for the industrial information flow can be considered as being made up of twelve types of information vehicle -

1. company records and data presentation;
2. reports from divisions and departments;
3. correspondence, memoranda and directives;
4. policy manuals, procedure guides, training materials;
5. catalogues and brochures;
6. trade papers and news sheets;
7. reports of contract research bodies, institutions, societies, government departments, universities;
8. publications of abstracting and reviewing services;
9. domestic and foreign patents and patent literature;
10. text and reference books and manuals;
11. journals and periodicals in scientific or other specialist fields;
12. news media.

These vehicles fall into three groups. Items 1 to 4 are primary sources. The material represented by them is of an 'in house' nature and would not normally be accessible to non company systems. Much of it could be of a confidential nature and could only be trusted to systems covered by adequate security procedures for restricted access.

Items 8 to 12 on the other hand, represent secondary source

material which is clearly in the public domain. This would presumably be retrievable by any information service which had the appropriate indices, equipment and procedures.

The balance of the material, represented by items 5, 6 and 7 is mostly secondary but may or may not be publicly available. Some trade material, for example, has limited circulation. Contract research bodies, consultants and institutions are often bound by their contracts not to release details of privately funded investigations. Some cooperative associations make their findings available only to members. In many of these cases information is ultimately released to the public domain but the release may not be complete and the time variable.

Taken together, these twelve items represent what we know as 'Information'. Who uses it and why is it important?

2. End use fields

Administration and Management.

I do not want to get too involved here with the differentiation between staff administration, as the setter of corporate and departmental structure and procedures; and line management, which operates that structure and makes the working decisions. It should be noted, however, that the administration branch of a company is responsible for setting up the framework within which line managers must operate. In doing so it becomes both a user and a generator of information, with inputs from both primary and secondary sources.

Over recent years there has been rapid development in organisation theory and the use of systems and procedures analysis to streamline administrative and management practice. This has naturally been accompanied by a rapid growth in the

volume of related literature. It has also, unfortunately, been accompanied by the publication and use of a lot of what has been called by one authority status patois. This is a very restrained term for the in language which modest competence uses to camouflage its sparsity of original thought.

Line management is similarly faced with a rapidly developing complex of new tools and techniques. At the higher levels it must be served from the public domain literature with trends in decision making aids, decision theory, management by objectives, technological forecasting and the reported experiences of contemporaries in applying them. From internal sources it needs reports and digests of operational data.

Further down the line the emphasis tends to move away from the secondary sources and towards the primary. More raw data are handled. At most levels the daily working information of a manager or superintendent is made up of presentations of data and action reports from below and statements of policy, objectives and decisions from above. Theory from the public literature has to be absorbed as the pressure of business will allow. For each level it is important that the type of information available and the manner of its presentation should be appropriate to the real needs of that level. They should help the man to optimise the use of his time. The art is to ensure that he has all that he needs but is not hindered by the oversupply of inappropriate material.

Marketing.

The competitive status of a company can be very much affected by the competence of its marketing division. This competence is a function of the availability of specialised

information and the skill with which it is used. To perform effectively a modern marketing officer has to be aware of new developments in marketing theory and techniques. These can be obtained from publicly available literature. Internal sources can supply technical data on properties and performance characteristics.

Much of the information needed in marketing, however, has to come from that difficult fringe area which is not wholly in the public domain nor available entirely from company sources. Systems must be available therefore which are capable of searching and data gathering in both areas. By this means intelligence may be built up relative to product life cycles, market trends and new technological developments in related fields which could later affect the market for company products.

Marketing is a field which can react very profitably with research and development. It can identify market opportunities which can stimulate R & D projects, provided that it has, and uses, the information flows which enable the potential opportunities to be recognised.

Engineering.

New materials for construction and other engineering applications are constantly becoming available. So are new procedures for using both the new and the traditional materials. In addition to reporting these the literature carries a steady flow of new data on the performance of the new and the traditional materials under a wide range of service conditions. To these can be added reports of new types of tooling, equipment and techniques, developments in theory and trends in maintenance and replacement policies. It adds up to a large and increasing body of material to

which the engineer must have access.

Apart from these new developments, engineering departments use a large volume of information for which safe, economical storage and rapid, reliable recall methods must be provided. This may be in the form of drawings, specifications, standards, design information, manuals, regulations, safety practice, maintenance schedules and approved procedures.

Production.

Production management must deal with a heavy load of primary source information, both up and down the line. The great bulk of it is data related to targets and performances, maintenance, safety, labor relations and industrial problems at the direct contact level. Internal information systems to handle this flow can optimise its presentation if well designed and operated, or can be a source of mistakes and costly inefficiencies if they are not. Poorly conceived information systems lead to ineffective communication between groups. This can result in low levels of operating efficiency.

Many of the advances in process technology are developed in cooperation with production departments by research and engineering branches in pursuance of the objectives of marketing and operational management. Recognition of opportunities for advances must also come in large measure from the production department themselves. This demands an awareness of trends in processing, equipment, raw materials, process control, testing and quality control. Such awareness is promoted by ready and guided access to the appropriate secondary source literature.

Research and Development.

The R & D division of an industry is normally the heaviest user of external information sources. For one thing, it works in non routine situations where many of the relevant and necessary facts are not immediately available. A working R & D project group needs not only scientific data but also background information, of both a technological and a business nature, on the fields in which it is working. In a more general sense it needs to be kept aware of new developments in techniques, data and theories in the special and general fields with which it is involved. Such a team is also anxious, when tackling a problem, to know whether other workers in the field have had to cope with a similar situation and, if so, how they went about it, what results they achieved and what conclusions they were able to draw.

New project ideas have to be evaluated for potential yield before commitments are made on them so information on the market potential of possible new products must be obtained and the researcher must have access to techniques and parameters for cost assessments, both for his projects and for the implementation of their results.

O.R. and E.D.P.

The most recent, but probably the most rapidly developing group of users of literature in industry are those people who are working with operations research, electronic data processing and the development of automatic process control. These whole fields, with their techniques, computers, other complex equipment and their literature have been introduced since World War II and have expanded enormously in the last decade. They are highly technical, highly specialised and moving rapidly. Equipment is extremely expensive and subject

to rapid obsolescence so the most up to date and efficient techniques for using it must be employed. The need for constant, rapid and efficient access to the latest literature, available software, data, and records, is therefore acute.

3. Problems with internal libraries

Providing service for the groups just mentioned poses many problems. Over the last two decades there has been an enormous increase in the volume of literature in the many fields in which the people in industry must keep themselves well informed. Many new specialist disciplines have been introduced. New journals have come into being to service them. There are also new journals servicing fields already well established. The situation is aggravated by the publish or perish syndrome which affects so many academics and public service professionals whose promotion prospects are influenced more by the volume of their publications than by their significance.

Book and journal storage requires expensive, preferably air conditioned space. Apart from the shelf area occupied by books, space is also required for indices and catalogues. To quote one example, ABTICS cards accumulate at a rate which makes embarrassing demands on library accommodation. It is therefore simply not practicable for a modern industrial library to acquire and store hard copy of all of the journals relevant to its activities. Microfilming can significantly reduce the storage problem but the costs of acquisition and processing of all appropriate sources are still very high because of the volume of literature involved.

Quite apart from storage, the magnitudes of the indexing, search and retrieval tasks are often beyond the capacity of a library of moderate size, even within a fairly narrow

specialist field. Magnetic or punched paper index tapes for machine retrieval of references are now available in many fields but are expensive and; together with the acquisition of staff and hardware to use them, do not constitute an acceptable proposition for individual purchase by small organisations. Total self sufficiency is therefore not practicable.

4. Problems in using external libraries

The power of a company's own library can, of course, be increased by its access to other libraries through the library loan system. Much has been done in recent years by librarians who have taken a very responsible, in fact dedicated, approach to this problem. Unfortunately, however, the present state of the art still does not make it possible to get optimal service for a busy operative with an urgent need.

Firstly there is the problem of uncertainty of acquisition. In spite of union catalogues it is not always possible to locate rapidly who has the material one needs, and to determine whether it is available either as photocopy or for loan as hard copy. When a source has been located there can be lengthy delays in obtaining the material. These can prove costly and frustrating to research or production staff anxious to get to grips with a problem, and with targets to meet.

Perhaps the most irritating factor is when the source library does not have copying facilities and can supply only the original journal for which the term of loan has, of necessity, to be limited to a fairly short period. This often diminishes the usefulness of the material because a busy man may not be able to get to it in the time it is available. When photocopy is supplied it is not unknown for a couple of critical paragraphs to be omitted because they had been

relegated to the back of the journal.

Even the rapidly developing use of rapid copy techniques is being threatened by the increasing tendency of publications to carry endorsements specifically forbidding copying, even for retrieval purposes. This is a problem worthy of considerable international effort to find a means by which copying could be allowed with adequate safeguards and royalties to the publishers.

5. Matching the service to the need

From the point of view of industry it is becoming much easier to specify the type of service that would be optimal. This is a subject which has been debated in depth over the last two years. An interesting array of facts and viewpoints has been produced and there seems to be unanimity on certain points.

The traditional role of the library as an acquirer and custodian of books and journals is being superseded by the establishment of total information services whose staff see their role as that of tracking down sources of needed information and making them available rapidly to those in need. Such a demanding task requires specialised training not adequately covered by the courses in librarianship currently available in Australia.

Five basic types of service are needed by the wide range of industrial users -

(1) Management information services operating on primary information sources to provide a flow of organised information needed for operational decision making. Systems may be required to provide daily, weekly, monthly or half yearly summaries of material, with or without

statistical analysis. Modifications of this type of internal service may be operated to provide several levels of executive, supervisory and operating staff with summaries of useful material from company reports, trade publications and the public media.

(2) Current awareness profiling is a means of keeping busy people up to date with new developments in their fields. The interest profiles of the customers are registered with the information service which then sends them, at nominated intervals, references to appropriate items which have appeared over a specified period in a nominated group of publications. Since the interests of individuals can change fairly rapidly, the registered profiles have to be updated frequently to be of use.

(3) Short term searching is often required to provide state of the art information on a specific topic. It may range in coverage from a narrowly defined problem to a wider field of theory or practice on which the customer requires to bring himself up to date. The search is confined to the most recent literature or internal reports.

(4) Long term retrospective searching is an extension of the short term search over a much longer period. A wide search for all that is available on a defined subject may be needed over the literature back to a specified date. This type of search is frequently needed in connection with the development of new products or processes and may embrace the patent literature. It is sometimes necessary to go back for a considerable period in order to determine whether an idea under consideration is novel and patentable.

(5) Often the literature located is in a foreign language. In this case, unless the customer is competent in that

language, he will require translations. It is a considerable help to him if the output from the search also contains information about whether translations are available. In cases where they are not, the information service should be able to provide them, either by commissioning external translation agencies or by having translators on its staff. I feel that an effective translation facility is an essential part of any information service.

Other speakers will deal with the techniques and systems by means of which these services can be provided. It is appropriate to emphasise here, however, that from the user's point of view there are two tasks involved. These are the search task; or finding where the information has been reported, and the library task; that of providing appropriate copy. It is desirable that these be treated separately and that there should be opportunity for dialogue between the service and the customer after the provision of a list of references but before the supply of copy of selected material. The most effective systems allow for interrogation of the search service by the customer so that he can narrow down the number of supplied articles to those few most likely to be relevant to his needs. Because of the volume of literature and the speed requirement of the industrial user, it is virtually essential that the search task be computerised.

All companies need some form of internal retrieval system operating on company and other restricted literature. The degree of sophistication depends upon the size of the company, the level of its technology, the way its various divisions are organised to make effective use of available information sources, and the level of efficiency at which it wishes to operate. The extension of an internal service to cover a wide

range of public domain literature as well is however, a heavy burden which, in the case of highly technical, small companies, could become insupportable. Some larger companies are at present operating such services because there is as yet no satisfactory alternative but there is a tremendous need for a central agency from which searches could be commissioned at a reasonable fee. Such an agency, concentrating the work load, would enable the collection and training of a balanced staff with competence not only in retrieval methods, but with qualifications in a range of disciplines which would provide understanding of the literature being searched. This would greatly increase the effectiveness of the service being offered.

So much for the service task, but this is only half of the job. It produces references. Having obtained a list of these the user is faced with the task of getting copies of the articles. He may have some of them in his own library. Some may be obtainable from other libraries in the neighbourhood and others must be sought from further afield. Australians do, in fact, use the National Lending Library for Science and Technology of Great Britain at Boston Spa to a considerable extent. Their copy service is so efficient that it is attractive even at this distance. A similar service in Australia, operating over a wide field of literature, would be an enormous boon. It would also offer some solution to the problem of copying documents because the allocation of royalties from such a concentrated source would be relatively easy to police.

6. The cost and value of information

There are three parameters of significance in assessing an information system. The first is the cost of establishing and

maintaining it. The other two are, the cost of not knowing important facts, and the cost of finding out by means other than having access to a retrieval service.

The cost of maintaining an information service will depend upon the breadth of the literature field to be covered, the level of reliability of retrieval aimed for, the number of users to be served, and the efficiency of the methods used. Efficiency will itself depend upon a number of factors, including the choice between manual, machine and electronic methods, hard copy or micro storage, whether the cost of acquisitions, hardware and software can be shared with other proprietors, and whether rapid copy facilities are available for material which the proprietor library does not hold.

In general, the cost of maintaining a service for a given number of users will increase as the breadth of coverage and desired reliability of retrieval increase, and can be estimated in advance for various possible combinations of available facilities. Before a choice of system is made however, the cost of not obtaining important information must be considered. This will be highest when the breadth of coverage and completeness of retrieval are lowest, and will diminish as they increase.

The real dollar cost of not obtaining information is difficult to assess directly. It becomes apparent only after the event, and sometimes not at all. Poor business performance can be rationalised as being due to so many other possible causes. By its very nature, non possession of information is likely not to be recognised. There are, however, adequate numbers of tip of the iceberg cases where organisations have been able to see, in retrospect, examples of market opportunities lost or money sunk in unprofitable ventures

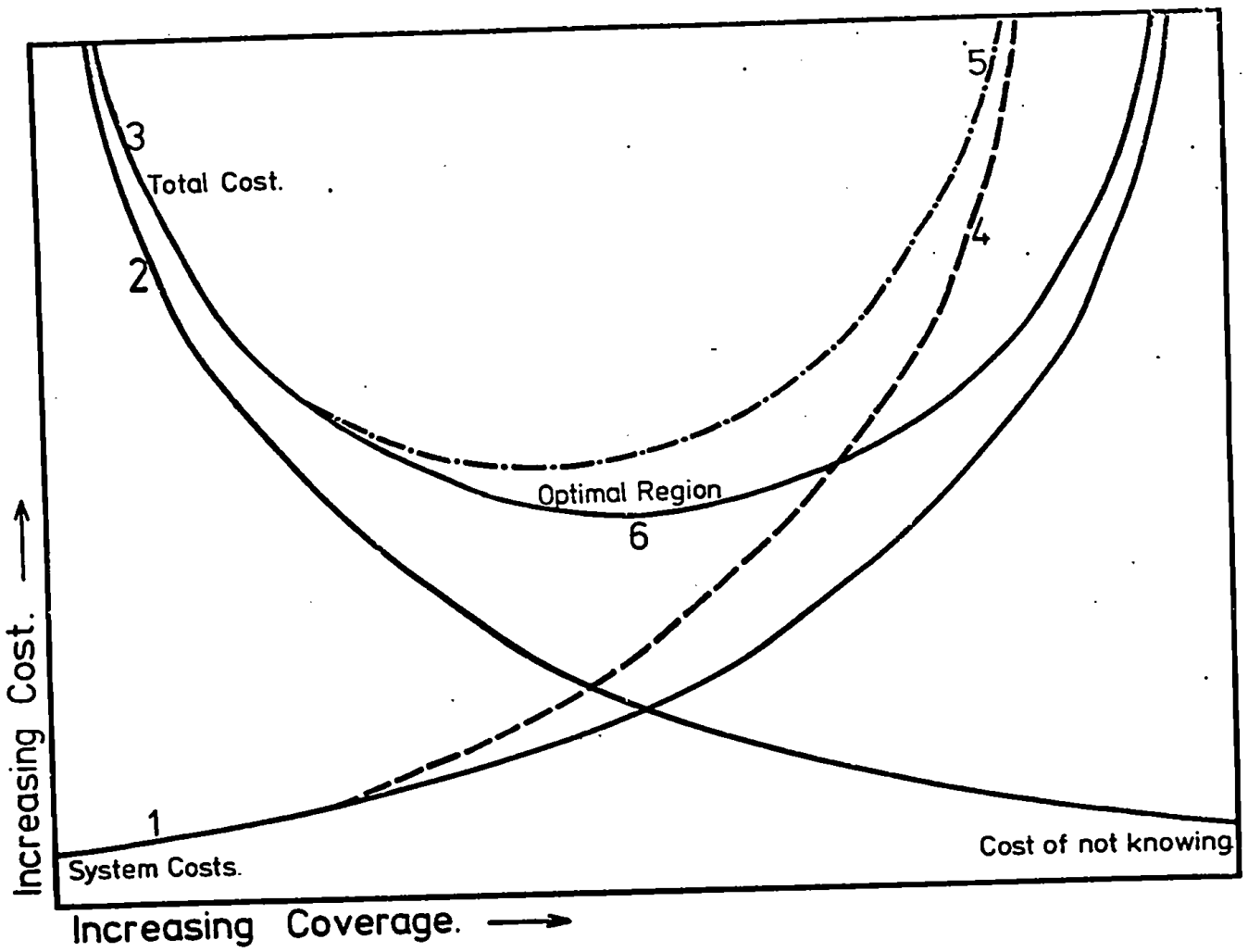
because of lack of awareness of such things as new competition, trends in business, or the arrival of new technology.

If unawareness becomes endemic in an organisation, then that organisation is in danger of going out of business. In this case we see the limiting condition of not knowing in the form of total business failure.

There is a wide spectrum of levels of information use between the maximum practical alertness and chronic unawareness. The position of a company in this spectrum probably correlates fairly closely with its relative efficiency as a business, and hence with its profitability. This is admittedly a loose, qualitative statement and other factors are obviously involved, but it would be interesting to see a quantitative survey of the relationship. Perhaps some economics department might find it an interesting project for a graduate student.

From personal observation I am inclined to feel that very often those most in need of an efficient information service are those least interested in obtaining it. This is not very surprising when you think about it. It is part of the unawareness problem. Companies which fall into inefficiency through technological slackness are often those who have paid little attention to maintaining attitudes of awareness through intelligent use of available information sources. They clearly pay a high price for not knowing, as do their customers.

Avoidance of this situation requires that the decision makers in the business must be assisted in the location and acquisition of the material they are expected to know about.



COST RELATIONSHIPS OF INFORMATION SYSTEMS

HWH Nov '71.

In general it is not practicable for a busy production executive to scan sufficient journals to keep himself well informed on all relevant topics. He has little time available for reading so must apportion it selectively to a relatively small quantity of material of known relevance. This has to be selected for him by a competent information service. But there is more to it than this. The in house material with which he has to deal in his normal operations should be organised so that it comes to him in the most efficient form.

The cost of maintaining an information service and the cost of not knowing important facts combine in an interesting way. This has been illustrated qualitatively in Figure 1, which is based on a presentation method recently used in another connection by a group of American authors.[1]

Solid lines in this figure represent systems in which the organisation maintains an internal service for in house information and a limited amount of secondary material, but has access, on a search fee basis, to cooperative or national systems for most of the literature. Dotted lines represent cases in which the organisation depends entirely upon its own system for all indexing and retrieval over all relevant fields.

As the level of completeness of coverage increases, the cost of maintaining the system also increases, but the cost to the organisation of losses incurred by unawareness decreases. The sum of the two costs passes through a minimum at some optimal level of awareness.

Lowest system costs correspond with the situation represented by point 1 at which only a modest library with minimal search capacity is available and minimal use is made of facilities outside the organisation. Because of the

amount of information which such a system fails to retrieve, point 2, the actual total cost to the organisation is high as at point 3.

Highest system costs correspond with the situation represented by point 4, in which very high levels of coverage and retrieval are targeted, using completely internal facilities for acquisition, indexing and retrieval for both primary and secondary sources. Total costs are high for this condition also, as at point 5, because of the high level of sophistication needed to obtain the coverage, which is not recouped over a sufficiently large usage.

The lowest level of total costs corresponds with the situation represented by point 6, at which the system costs and cost of missed information are held in reasonable balance. This point is probably most likely to be achieved with an internal system of size and sophistication appropriate to the company's needs for efficient treatment of all its primary source material and for interfacing with large institutional or governmental systems for access to the wider fields of literature. In all but the smallest organisations this means a computer based internal system. In all cases it requires access to a very large and efficient public or shared system.

7. The cost of finding out by other means

The cost of finding out by other means can be quite high. Empirical trial and error techniques can be very expensive, particularly when the error ratio is high. The less information available for the trial, the higher that ratio is likely to be. The alternative is research.

Research and development are the most effective means available for generating new marketing opportunities, finding

more efficient means of production, finding new solutions to problems, or developing special solutions for local and immediate situations. An appropriate level of effectively applied R & D expenditure is therefore a vital necessity in any business. Research, however, is costly and we are constantly striving for efficiency in conducting it. It takes something of the order of $25,000 to $30,000 per graduate per year to operate a modern scientific laboratory, not including major capital expenditures. Naturally one does not want to dissipate funds at this rate by working on problems for which solutions have already been found elsewhere, and published. Rather, we would prefer to deploy our available resources in funds and manpower to effective work on projects for which the literature can offer no substitute. It is therefore desirable that, before committing R & D funds to a project, one should be made aware of what has been done in the field by the conduct of an effective literature search.

A research scientist must, of course, spend some time in the library, but his real function is in the research itself and he should not be kept occupied any longer than is necessary away from it. It is not possible to avoid allocating a proportion of time to reading, but, to the extent that it is practicable, this time should be spent on effective reading and not in tracking down sources of information. This is the task that must be done rapidly and efficiently as an available service. If a competent information retrieval service is not available, then finding an answer in the literature by inefficient personal search can prove to be more costly than actually repeating an unnecessary piece of research.

The provision of effective information services at

reasonable cost is therefore essential to the efficiency of the R & D activities of an organisation. It helps to avoid unprofitable use of research staff on inefficient retrieval and it can obviate wastage of their time on project work which need not have been conducted.

We have already examined, earlier in this paper how, through the contributions which a good service can make to the activities of other divisions, it can become a significant, if not critical factor in the efficiency of the organisation as a whole.

Information is as much a raw material of modern industry as are the physical consumables which go into the making of its products. Efficiency in its supply is as important as it is in the case of any other raw material.

REFERENCE

1. Chambers, Mullick and Smith, 'How to choose the right forecasting technique', Harvard Business Review, Vol.49, no. 4, July-August 1971.

DISCUSSION ON FIRST PAPER

Translations

(Lord Mayor). The translation of scientific papers appears to be a problem in that translators are readily available but lack the desirable background of scientific knowledge. (Dr Hosking). It is essential for a translator to have scientific knowledge in order to convey the intended sense. The best translators are those who are not translating from their mother tongue. A translator requires familiarity with a foreign language but not the competence of a linguist. (Dr Lean). Experience helps translators to become proficient in meeting a company's requirements. It is possible to purchase translations but frequently these have to be edited. (Dr Hosking). Translators on the staff of the B.H.P. are encouraged to read technical literature in the language they translate. (Mr Flowers). Research workers should themselves learn foreign languages, especially French, German and Russian, and if necessary take crash courses. (Dr Hosking). Agreed, but it would be impracticable to take crash courses in eighteen languages. A language such as Japanese presents special difficulties. (Dr Lean). Translations are usually made after examination of an article or an abstract from it, and the translations are usually draft rather than full. (Mr Flowers). Most trouble with translations occurs with languages other than German, French and Russian. (Comment). More full translations are now being published.

Information Retrieval Services

(Lord Mayor). It would appear that one source of translations and other information would be desirable. (Mr Martin). The National Lending Library for Science and

Technology would be a good example to follow for the supply of material, but would Dr Hosking agree with the suggestion of R.A.C.I. that it is most desirable to develop a dissemination system on a national level. (Dr Hosking). Yes, but practical realisation will take time so progressive development would appear to be necessary. (Mr Flowers). Industry has not spent enough on orthodox information services, and seems to be looking for a way out with computers. The achievement of computers must be viewed with caution and will not absolve industry for responsibility with orthodox services. (Dr Hosking). Agreed. Industry, with notable exceptions such as I.C.I.A.N.Z. and C.S.R., has not appreciated its own need for information. That is why there are only twenty eight people at this seminar, and not 500. The computer is not a panacea, but is the only means of dealing sufficiently rapidly with the bulk of material that must be handled. The answer lies in massive use of facilities at a national level. Even then industry must use its own systems to work on its primary source material. Interfacing of these systems with those available publicly will be necessary. (Mr McPherson). Conventional library methods can still do a good job in restricted subject fields. (Dr Hosking). Only at a certain level. They still miss a lot. (Mr McPherson). Access may be a little slower but conventional methods are still practicable at certain levels.

THE MECHANICS OF SUPPLYING INFORMATION TO INDUSTRY,

by Mr H.W. Groenewegen, Librarian, Australian Atomic Energy Commission Research Establishment

1. The nature of the problem

It is my task to tell you something about the mechanics of supplying information to industry. And I should first make it clear that I am speaking about published information. There will of course be occasions when industry is in need of information which cannot be located in the published literature. This may be because the information is not known, or it may be that although the information has been recorded the document in which it is recorded is not known, or it may be that the document in which the information is recorded cannot be located, although it is known to exist.

In the first situation the librarian cannot help, so that industry must turn to laboratory investigation and research to establish what it needs to know. In the other two cases the librarian should be able to help and thus save industry the cost and effort of rediscovering the information. However, all too often the claim is made that the cost of locating the document in which the information was recorded is greater than the cost of rediscovering the information in the laboratory. It is doubtful whether this was ever the case and it is clearly becoming less true as time goes by; in fact quite the opposite. There are cases on record where literally millions of dollars have been wasted because of someone's failure to conduct a proper literature search. I am indebted to Miss Betty Doubleday, Chief Librarian of the CSIRO for two spectacular examples of this.

She tells of the cloud seeding experiment which was conducted in the United States some years ago at a cost of

some quarter of a million dollars and which was inadvertently duplicated. 'The duplication was discovered 3 million dollars too late by a librarian who stumbled over a report of the first project.' She also relates the story of 18 million dollars worth of unintentional duplication in research effort when both NASA and the U.S. Air Force independently from each other spent a year developing similar space vehicles, the Atlas Agena B and the Atlas Vega.[1] There may be some in my audience here today who could relate similar stories from their own experience, even if the amounts involved did not quite reach the million dollar mark.

And yet the belief on the part of many scientists that rediscovering in the laboratory is cheaper than rediscovering in the library still persists. The source of this belief can be traced to the phenomenon called the information explosion. I do not want to get involved in detailed discussion of this concept, which is surely familiar to you all. I will simply quote two statements that have been made by others to indicate the problem. Firstly, Freemont Rider in his book 'The scholar and the future of the research library', applied a mathematical model to the growth of research library collections. The model can be described very simply. 'Library collections grow by a more or less fixed percentage each year, which results in a doubling in their size every 10 to 20 years (the period being different from one kind of library to another).'[2] The reason for this exponential growth in library collections may well be found in the other statement I wish to quote. It comes from Pierre Auger's 'Current needs in scientific research'. 'The number of scientists alive today is equal to 90 per cent of all the scientists and research workers who have existed since the beginning of history.'[3] With all these scientists busily

recording the results of their research in books, journals, and technical reports, as indeed, only too often they are obliged to do to get their promotions, it is no wonder that we are being swamped with information.

Given this large flood of information, the problem is two-fold:

(i) to prepare a catalogue guide, directory, index, call it what you will, to the information recorded and published around the world,

(ii) to collect and store the documents containing this information so that any one, having been made aware of the fact that a particular item of information has been published through use of the index may locate and gain access to a copy of the document that contains it.

To the extent that librarianship or documentation (a word I do not like) has succeeded in solving these two problems, the librarian can assist industry in locating and placing before it the published information which it needs. I would like to spend the rest of the time allocated to me in giving you an assessment of the extent to which librarianship is succeeding in this task, and I would like to suggest to you that we are making great progress at the solution of the twofold problem.

During this discussion I will quote from time to time from what I consider to be one of the most significant and important documents that have been published in this field for a long time. The document is called 'UNISIST' and is subtitled 'a synopsis of the feasibility study on a World Science Information System by Unesco and the International Council of Scientific Unions'.[4] In my opinion this document is important because it is both symptomatic and at the same

time the most ambitious product of what is happening in the world today towards improving the mechanisms of information. It is also certain to advance development of world wide scientific and technological information services to a considerable extent.

2. The preparation of indexes to the literature

In the early years of this century an attempt was made to set up in Brussels what was called a Repertoire bibliographique internationale, a central catalogue, designed to record the world's literature by subject and author, including not just books, but pamphlets, journal articles, etc.. In 1914 the catalogue consisted of 13 million cards but the outbreak of the first World War brought this grandiose scheme to an end; there is little doubt that in time the system would have collapsed in any case under its own weight. From it we have inherited the International Federation for Documentation, which still exists, the Universal Decimal Classification, which was adopted from the Dewey Decimal Classification for the specific purpose of subject indexing the vast collection of references being collected, and a grave suspicion of the feasibility of our ever being able to compile a universal catalogue of information.

That is, until the coming of the use of computers in the processing of bibliographic information. The computer has three capabilities which are of increased value in our efforts to achieve bibliographic control over the world's literature:

(1) it has offered a way of manipulating very rapidly and accurately large quantities of information,

(2) it has offered a way of obtaining multiple access points to any one item of information, providing these access points have been tagged for retrieval,

(3) after an initial period in which even traditional standards of bibliographic descriptions were completely abandoned, the computer is now enforcing increased standardisation on bibliographic data handling operations at both the national and international level.

I would like to elaborate on each of these points for a moment.

The first, increased speed and accuracy is well known to anyone with even the slightest familiarity with the computer. Where large quantities of information are concerned this capacity of the computer is of inestimable value, because we are really talking of large quantities. For example, the European Nuclear Information Service operated by EURATOM in Luxembourg has, in a period of 10 short years built up a file of 1,000,000 references to atomic energy literature. Compare that to the personnel or salary records of even very large companies.

The second, multiple access points, is of tremendous importance. This capacity allows us to use the computer to select from a randomly ordered file of bibliographic information, quickly and with little effort, the complete citations (references) to all items published in a particular country, or by a particular author, or in a particular language, or, with commensurably more effort, citations which have been indexed as dealing with any particular subject or combination of subjects. To achieve this same result in a file organised for manual searching requires multiple entries under author or authors, country, language and subject headings, all filed in one or more alphabetical or other known order of citations or at least references to citations. The savings in clerical work to maintain this file and the

reduction in the physical size of the file are of course highly significant.

The third, standardisation. The most spectacular achievement is of course the MARC format, developed by the Library of Congress in the U.S.A. as a standard communications format for bibliographic information in machine readable form, which is now being adopted internationally, notably by the U.K. for the production of the British National Bibliography but also by Australia for the Australian National Bibliography.

These three capabilities of the computer have greatly facilitated the handling of bibliographic information, once that bibliographic information is available. Availability of adequate descriptions of bibliographic items, properly indexed and abstracted to indicate their subject content, is of course a prerequisite, before this information can be converted to machine readable form, let alone computer manipulated. The fact that many people talk of 'information retrieval systems', rather than 'information storage and retrieval systems' indicates that they underestimate the essential nature and complexity of this task. And yet the very size of the task has forced organisations and governments, no matter how large or wealthy, to turn again towards forms of international cooperation to perform it. In illustration, I will quote from the UNISIST report.

'The unit costs of input, that is of preparing the individual bibliographic records in terms both of the descriptive elements and of the intellectual analysis of their subject content are high. Indeed, the high cost of maintaining input for an ever increasing volume of scientific publications tends to limit the world's population of potentially competitive

systems. Further, it has already become evident that no one country, even among those presumed to have superior resources, can afford to maintain the input levels independently.'
The unit cost of input to the system, which is estimated at, from $20 to $30 per item, would doom to failure any nationally based comprehensive information system even within a fairly restricted area of science and technology, such as biomedicine or nuclear science. International cooperation has not only made possible a continuation of the inputting function, but has made it possible at a higher standard.

To demonstrate this trend, I will describe for a moment a system in which we at the A.A.E.C. are privileged to participate, and in the planning and implementation of which we have been able to play some part.

This system had its origin in 1966 when the International Atomic Energy Agency circulated to all its Member States a document proposing the establishment of an International Nuclear Information System. (The International Atomic Energy Agency is an autonomous, inter governmental organisation, which, under the aegis of the United Nations, is responsible for international activities connected with the peaceful uses of atomic energy.)

The basis of the proposal put to the Member States was 'the premise that some literature handling functions are best centralised and others decentralised'. Member States were invited to participate in a system under which they would be responsible for scanning the literature they produce in nuclear science and technology and for selecting from it that which falls within the agreed subject scope of the system. The information so selected would be described and subject indexed in a form suitable for computer input. This would

be forwarded to a centre at the IAEA headquarters in Vienna, together with an abstract of each item and a copy of each item not commercially available. The IAEA Centre would be responsible for putting the text material (i.e., the abstract and document, if supplied) into a form suitable for direct reproduction and for feeding it away for direct access. The Agency would also distribute copies of the abstracts routinely to participants desiring them and copies of the complete document in microform would be available from INIS headquarters upon request. The descriptive information and subject indexing provided by the Member States would be prepared for input to the computer system.

With the aid of the computer the Agency would provide a variety of bibliographic products. This would include magnetic tape, containing descriptive information and subject analysis of all documents reported to the system and this would be distributed every two weeks. Computer printed, subject classified accession lists would also be distributed regularly.

This system was introduced, with some relatively minor changes, in April 1970. Since that time the A.A.E.C. has provided input to the system and has received output both in conventional and machine readable form from Vienna. At present this is being received monthly, but a change in frequency to fortnightly distribution is expected to take place in 1972.

Through the National Library, Australia also participates in a similar system for biomedical literature. It is clear that this kind of activity will multiply. For example the FAO is at present developing a system called AGRIS, which is closely following the model provided by the INIS system, and

which will deal with agriculture and food production.

I have taken some time in describing INIS because it illustrates clearly the internationalisation that is occurring in the compilation of worldwide science bibliography. UNISIST has recognised the value of these international efforts by including in its report a number of recommendations specifically related to this activity, under the heading 'Tools of systems intercommunciation'. The first of these contains the statement 'The basic philosophy of UNISIST makes it mandatory to develop international programmes for sharing the work and the products of information transfer at each stage of the process through the voluntary cooperation of all parties concerned'.

The effects of improved science bibliography will be felt by all consumers of scientific literature. Its benefits are not just restricted to those who have access to computers and the necessary know how to search the machine readable bibliographies. The conventional tools for reviewing the literature such as abstracting journals and periodical indexes will continue to play an important role in information retrieval and may for quite a long time continue to be guides that you will use to lead you to the information you require. But the use of computers in compilation and the international basis on which input is collected and prepared will mean that these conventional guides will be more timely and comprehensive At the same time it is very likely it will soon be possible, even for relatively small consumers of information, to subscribe selectively to the products of computerised information services, such as current awareness services and retrospective search services. Indeed, within this country it is already possible to commission retrospective searches

from the MEDLARS service, dealing with biomedical literature, through the National Library of Australia.

3. Access to the published documents

However, it is not enough to be told what publications of interest exist; we saw that the problem of information provision is twofold, the second part relates to the problem of gaining access to the actual documents once having been told of their existence.

Overall, Australia has fairly good resources in science and technology, the problem is one of gaining access to them, i.e., in particular, of locating a copy of the required document and having located it in a library somewhere in Australia, of getting hold of it, without undue delay.

Various solutions to this problem have been proposed in different countries of the world. In the U.K. the National Lending Library for Science and Technology was set up with the express purpose of collecting and making available scientific literature of the world and of promoting its use. The NLLST makes the literature available mainly through its loan and photocopying services. The Library has gained a reputation for efficiency and speed of service to the extent that even many Australian libraries utilise its services regularly.

Other countries, such as Canada, see that in the future the problem of access to resources will be solved as a result of the emerging trend to think in terms of library networks. Hayes and Becker in their 'Handbook of data processing for libraries' point out that 'it has long been clear that some degree of cooperative allocation of resources among a set of libraries can produce not only a more

efficient total operation but even a more responsive one... but the effects of the computer, of modern communications and of data processing in general will vastly increase the scope and context in which we can see library cooperation'.[5] At least within the United States, it is now possible to think in terms of using new technology economically for interlibrary communication so that problems of distance and time will have increasingly less meaning.

Hayes and Becker's model for a library network consists of a number of cooperating groups of individual libraries. Such groups may be based on geographical area or area of specilisation. Each library in the group shall have a contractual obligation to carry out certain commitments to the network of which it is a part:

(1) a commitment to make its collection and services available to the constituency served by other libraries in the group on the same basis of service to its own constituency;
(2) a commitment to maintain an agreed upon level of service;
(3) a commitment to pay for a proportionate share of the cost of a union catalogue of the holdings of the group;
(4) a commitment to contribute to the establishment or augmentation of a collection strong enough to serve as a reference center.

4. Information networks

Hayes and Becker then go on to suggest that once these kinds of library networks have been established, the possibility of another kind of service has been opened up. 'It is the use of libraries as the crucial administrative agent in national "information networks" that depend on the digital computer to search large files.'

By 1980, they predict, such networks will be able to provide sophisticated information services, from a wide variety of media including books, serials, microforms, magnetic tapes and disks, and data cells, available at a number of physically separate libraries that represent both points of physical storage and points of access and service. Communication between libraries will be at a high level of mechanisation and will include facilities for the direct transfer of mechanised data bases, for facsimile transmission of printed material and real time transmission of video material. Each library will have a 'union catalogue' showing what mechanised data is available in other libraries in the network.

Mechanised catalogues and indexes based on standard book numbers will make the routine tasks of ordering and accessioning easier and will allow for vastly expanded utilisation of centralised cataloguing facilities. It will also enable the library to issue users with printed catalogues of their collections, designed to meet their particular subject requirements. There will be on line recording of circulation transactions.

Specialised information centers will be set up to meet the needs of users in specialised fields. Computer based services recorded by these will include information retrieval, question answering, text processing and data analysis.

Some of the major libraries will fulfil a special role as 'primary stores of unique material, of material for general use but not used frequently enough to warrant duplication, and of material for fields not served directly by specialty libraries and information centers'. In general they will have 'back up' function, not only in regard to primary source

materials, but also in regard to computer based services, particularly to support smaller libraries and specialised ones.

Hayes and Becker regard this model as a 'conservative' one for the U.S.A. for 1980. I would suggest that many Australian librarians are less optimistic about the progress that will be made in Australia in this regard in the next nine or 10 years.

However, it is very encouraging to record that there is at present activity going on which could be of major significance to the implementation of programmes which would lead to a realisation in Australia of the kind of 'information networks' described by Hayes and Becker.

Some of you may be aware of the existence of STISEC, the Scientific and Technological Information Services Enquiry Committee, established by the Council of the National Library, to investigate scientific and technological information services for Australia. Mr G.D. Richardson, the next speaker on the programme, is a member of the Committee and will, I understand, make some further reference to the work of STISEC in his paper.

However, if Mr Richardson does not mind me poaching first a little on his domain, I would suggest that, as librarians, we look forward to STISEC producing a plan which will allow Australia to progress towards the establishment of the kind of information network envisaged by Hayes and Becker. It seems to me that the most significant single action STISEC can take is to recommend to the Commonwealth Government adoption and implementation of Recommendation 15 in the UNISIST report, which reads in part:

'A governmental or government chartered agency should exist

at the national level to guide, stimulate and conduct the development of information resources and services in the perspective of national, regional and international cooperation'.

The establishment of such an agency, charged with the responsibility of coordinating, developing and integrating the many institutions that are at present providing information services in Australia; of supporting financially the research and development that is necessary to introduce successfully new techniques and of fostering the educational programmes, necessary to supply Australia with the trained personnel to carry out the research and to man the networks, is an essential first step towards achieving the goal of improved access to information.

I started this talk by referring briefly to the 'information explosion'. I will finish it by quoting once again from the UNISIST report: 'The so called "information crises", has lost both its novelty and its power to alarm... We are spending more money, employing more people, assembling more libraries than ever before in history...We still have an information problem but we have learned to live with the quantitative aspects of it'.

I have tried in this brief talk to suggest some of the ways in which we are 'learning to live' with the information problem and some of the proposed solutions which, hopefully, will enable us to eliminate the problem altogether in the next 10 or 20 years. There is no doubt in my mind that for the solution to be acceptable, it must relate to a significant extent to solving the information problems of industry. But I am confident that the solutions that are being proposed, and to which I have referred today, will be found to be able to

do so.

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DISCUSSION ON FIRST AND SECOND PAPERS

Computers

(Lord Mayor). Are there any computerised libraries in Australia? (Mr Groenewegen). Yes. Some libraries use computers in housekeeping functions of supplying information to themselves, and some in supplying information to readers. Examples of the latter are the National Library of Australia's MEDLARS service, the C.S.I.R.O's similar experiment in the area of chemistry, the Atomic Energy Commission's experiment with magnetic tapes from Vienna which may result in a public service by the end of 1972, and experiments by companies such as C.S.R. and I.C.I.A.N.Z.. The cost of input is so great that it is beyond the reach of individual companies which must rely on national or international services for the supply of data bases on tape. (Lord Mayor). Is there a common computer language? (Mr Groenewegen). Yes, although there is the complication of non standardisation among different makes of computer. Tapes produced in Vienna are used in many countries on different makes and models of computers. The English language has been accepted as the carrier language for these tapes. (Mr Neale). A qualification to the use of nationally or internationally produced tapes is that some companies require more intensive indexing for their own specialised purposes. E.g., the C.S.R. found that the subject of sugar technology was not adequately covered by Chemical Abstracts. Companies may not be able to wait for governments to set up national library services, and may have to create their own tapes. E.g., B.H.P. has to index its own internal reports. Commercially available tapes will be purchased, but these are likely to cover no more than one third of the information available. Conventional library methods will still

be heavily used. (Lord Mayor). Could you afford to miss this third? (Mr Neale). No. Mr Groenewegen's costs for putting information on to magnetic tape are queried as being too high. (Mr Groenewegen). The difference in opinion as to costs would be due to different factors being included in the costing. Costs quoted would include the costs of abstracting and preparation of a computer citation, as well as coordinate indexing. (Mr Neale). There is now more reluctance to start new data bases before finding out what has already been produced elsewhere. (Mr Groenewegen). More data bases are becoming available but their cost is a consideration. Government has an advantage in making them because of less dependence on commercial information.

Quantity of recorded information

(Lord Mayor). Newspaper clipping services appear to be helpful in saving time. (Dr Hosking). Yes, but there are still the problems of repetition and knowing whether the coverage is adequate. Businesses have in-house newssheets that alert their staff to information available, like an abstracting service, but these have limited value. There is a problem of getting a wide and deep coverage of a particular field, a retrieval problem. (Lord Mayor). A garbage extractor? (Dr Hosking). Yes. Literature needs sifting. The publish or perish principle produces about ten times as much literature as information. Nine papers on six facts get names of authors into citation indexes. The problem is to get at the facts, even the titles may be misleading. (Lord Mayor). Should there be a law against such publishing? (Dr Hosking). More critical refereeing by journals would help to limit the amount of literature but could impose a kind of censorship and impose severe strains on editors and

referees.

Computers

(Lord Mayor). A computer could record only relevant material? (Dr Hosking). The responsibility would then rest on the coder who is not omnipotent and who may not appreciate the significance of different articles. (Lord Mayor). What are the possibilities of using a computer within a region? (Mr Flowers). It would be necessary to rely on international services because of costs involved. On the other hand international services could help to standardise such things as filing procedures and to reduce expenses in library operations. (Lord Mayor). If a region is too small to support computerised information, what area would be necessary? (Mr Flowers). A national or international system would be needed. (Dr Hosking). There is need for a number of systems at different levels and for different purposes. E g., wars would interfere with international systems. Systems should be interrelated. (Lord Mayor). A company does not have to own a computer for its own system, and can hire time. (Mr Groenewegen). Regional information systems integrated with international systems are needed. The Newcastle region could be a convenient size, whereas New South Wales would be too large for reasons of access. (Dr Hosking). How much should be put into an information system? Everything published? Costs would govern the cut off point. Perhaps indexing should be international and retrieval regional. If journals published their own indices, the indices could be fed into a data bank. There is a possibility that some journals will be available in index form on tape in advance of actual publication so that retrieval can be very rapid.

Conventional methods

(Mr Smith). The discussion so far assumes a sophisticated level of information retrieval. Some companies, however, have not reached this level and may need guidance on more rudimentary matters. (Mr Groenewegen). Abstracting services are the first tools needed by industry. (Mr Neale). Industries cannot go it alone without some form of information control. All industries need information and should have their own libraries with someone responsible for their own recorded information. The person in charge should index, control and keep the records as well as knowing what material is available elsewhere. The organisation of information is essential for industrial survival. (Mr Groenewegen). Unfortunately some people would prefer to go back to the laboratory to 'rediscover the wheel' rather than read a book. They must realise that information means money. (Dr Lean). The traditional library has not provided commercial intelligence. Keeping abreast of commercial and competitive developments is necessary for commercial effectiveness. (Mr Neale). The traditional library has not gone past printed literature which provides only part of the information required by industry. Management often has been slow to recognise the value of information. Librarians should become evangelists in overcoming this situation.

THE ROLE OF GOVERNMENT IN SUPPLYING INFORMATION TO INDUSTRY.

by Mr G.D. Richardson, Principal Librarian,
The Library of New South Wales

We have already today, under the guidance of Dr Hosking, considered the importance of information to industry, while Mr Groenewegen has led us in discussing the mechanics of supplying that information. My own part in this seminar is closely related to both these since it is concerned with the role of government in supplying information to industry.

It is, no doubt, to be taken for granted in almost any advanced industrial culture that there is some kind of partnership between industry, whether primary or secondary, on the one hand, and government, as the corporate organisation of the whole community, on the other. The president of the Associated Chambers of Manufactures some years ago spoke of it as a strengthening partnership.[1] Perhaps one reason for this is that industry, or an industry, is too complex in its organisation and its economics to seek to be quite independent. It must be a part of the whole, while some industries may even depend upon the community at least as much as the community depends upon them. Certainly some need government assistance, in the form of subsidy or tariff protection, which a government may give because it considers this kind of support to be desirable in the national interest, for security or other reasons. But it is well to remember that government decisions are ultimately made on essentially political grounds.

In Australia itself, there is also, as you know, a long tradition of government paternalism, deriving from the nature of our history and geography, although there is no need to go

into this now. In any case it would seem that, at least until fairly recently, government paternalism to industry in this country has been directed a little more towards primary industry than to secondary industry with which you are mainly concerned. There is, however, a more fundamental, and, as it seems to me, a much more important reason why governments should support industry, and support it not merely by way of protection or financial assistance, or even by providing better communications such as roads, railways, port facilities and so on, or any of the other environmental needs of industry, but support it especially by the provision of information which is fundamental to any advanced activity.

That reason, which is the essential basis for the interest of government in this vital matter, was set out very clearly in a recent article by the economist, Dr Colin Clark.[2] He quoted Professor Simon Kuznetz as saying 'The cause of economic growth is knowledge'; and from there he went on to draw the conclusion, which seems to me indisputable, that widespread general education, whatever other benefits it may have, is also fruitful economically. In similar vein, a parliamentary and scientific committee in the United Kingdom reported soberly in 1968 that 'the fact is that the systematic organisation and exploitation of scientific and technical knowledge are so vital to the nation's material prosperity that no Government can afford to ignore their importance.'[3]

This same committee found, also, that in the United Kingdom a high proportion of existing scientific and technological library and information services are dependent on public expenditure, either central or local. But it went on to say that the scientific and technological information network of the country was what it called 'as good an example of a non

system as it is possible to find',[4] with the implication, moreover, that it was being used haphazardly and unsystematically. You will probably agree that it would not take a great deal of investigation in Australia to reveal pretty much the same sort of situation, both as to public expenditure and to use.

Nevertheless, there are signs of change. A survey, for example, conducted in 1968-69 by Schaefler and Melton for the Commonwealth Advisory Committee on Advanced Education reached this conclusion, if you will permit one more quotation: 'It is clear from the literature reviewed that there is a growing recognition by government that effective transfer of information, particularly from the research and development level to the applications level, does not take place automatically and that the availability of active information services is therefore an important factor in ensuring a healthy state of technical know how in industry and commerce.'[5] These investigators found also, in respect of information for industry and commerce, that 'individual organisations can no longer cope with its sifting and use. The tendency is therefore for a greater government involvement in the provision of information services.'[6]

There is evidence, then, that governments must needs have a very real concern with industry and with the supply of information for it, especially, it may be added, as the world of industry grows internationally more competitive and the effort needed to remain in the forefront of industrial development becomes greater as technology leaps forward. Secondly, government has already done and is doing a good deal, if rather unsystematically, towards providing information for industry. Thirdly, the interest of government in information

for industry is increasing.

Let us consider now in a little more detail some of the kinds of government supported information services which are of use to industry, although they are not necessarily designed for industry alone. Naturally it is not practicable here even to summarise them all but I should like to cite a few examples and to consider one or two in greater depth.

Broadly speaking, there are four principal aspects of the role of government in this. First, governments promote or conduct research, whether 'original' or 'applied'; secondly, governments issue government publications, whether embodying the results of new research or simply designed to disseminate information; thirdly, it is a specific function of some government departments or agencies to supply information on request, for a specific purpose; and, finally, governments maintain or support great reservoirs of technical and industrial information in libraries. Here we may also include local government, as witness the Newcastle Public Reference Library and the work of the Newcastle Industrial Library Advisory Committee, and indeed this very seminar itself.

Of research by government agencies and the information that flows from it, the most obvious example is the work of the Commonwealth Scientific and Industrial Research Organisation. This was founded in 1926, to replace an earlier Institute and, as you know, it has done a great deal of invaluable research in many fields, from textiles to fisheries. Moreover, as the Commonwealth Directory tells us, it has as its responsibility 'the collection and dissemination of information relating to scientific and technical matters, and the publication of scientific and technical reports, periodicals and papers.'

This it certainly does: in 1970-71 it spent well over $1,000,000 on 'Information and publications'. But the almost universal use of the initials 'CSIRO' may tend to obscure the fact that the 'I' stands for 'Industrial'. Most of the more spectacular results of the Organisation's research seem to have been in the field of primary industry, and especially the agricultural and pastoral industries. It is therefore of some interest in this context that one observer, in a study in Australian industry in 1968, reported that to those in industry 'CSIRO was removed from their direct interests and for most companies would inevitably remain so.'[7] If true, this is regrettable.

Of government publications generally, little need be said except that they cover a very great range of interests and take a wide variety of forms, from a simple practical leaflet to the report of a royal commission, and from a map of mineral resources to the schedules of customs tariffs. Any or all of these may furnish necessary information for industry in one way or another.

A more direct kind of information service provided by government is that given by a department such as the New South Wales Department of Decentralisation and Development. This is not so much concerned with conducting original research as with detailed investigations, including the gathering and collation of information, to assist manufacturers especially in establishing new industries or new factories. It is concerned with providing data and advice, on request, about sites and services, resources, markets, labour supply, and facilities generally. It also issues quite a wide range of publications related to these.

Information of a comparable nature is, of course, provided

by many government departments, although not as their primary function. You will not need to be reminded of the data compiled, for example, by the Government Statistician, or of the specialised technical advice or information that is available from the Department of Agriculture in New South Wales or the Commonwealth Department of Trade and Industry. Little effective publicity seems, however, to be given to some of the information services that are available. For example, even though the Department of Trade and the Commonwealth Department of Works are both able to provide information that may be of considerable importance to industry, the Commonwealth Directory does not mention information as a function of either of these two Departments. One may reasonably suspect that Australian industries are like those in Canada, which, in spite of notable developments, were reported in a special study in 1969 to be generally unaware of many of the services available to them.[8]

So far we have been considering information generated by governments, or deliberately gathered and disseminated by government agencies. There are, however, tremendous sources of published information, not necessarily generated by governments, whether these are in the form of technical reports, periodicals, patents, printed books, or any of the microform kinds of publication such as microfiche, which governments in Australia, and perhaps particularly in New South Wales, as in other advanced technologies, make readily available to the public at large, including industry. There is, although some of you may not be fully aware of it, not only a very great resource of published technical information readily available in libraries in New South Wales, but there is also a fairly active exchange of it by way of photocopies

and interlibrary loan.

This latter process, though cumbersome, is greatly facilitated because of government expenditure in providing the relevant bibliographical aids, that is, in effect, sources of information about where required technical information is available. Thus, CSIRO produces its union catalogue, Scientific Serials in Australian Libraries, to make the location of a given scientific or technological periodical in Australia a matter of instant reference. Similarly the National Library produces a comparable union list for serials in the social sciences and humanities, including those concerned with commerce, and is developing a national union catalogue of monographs in Australian libraries. At the same time, there is being developed through the National Library the use of the computerised medical information service, known as MEDLARS, of the National Library of Medicine in the United States, while the use of MARC, meaning 'machine readable catalogue', developed by the Library of Congress, is also being taken up here in Australia.

However, before going on to consider possible developments in the provision of scientific and technical information in Australia, let me mention what we have been doing, fairly quietly and without much publicity but with, we think, considerable success, over more than half a century in the Library of New South Wales. This is the work of our Research Service, whose principal function is to provide, on request, specific information for industry to solve specific problems.

This Service, which employs the equivalent of about six people, including two graduate librarians and a very senior science trained librarian as its director, now costs the taxpayer something over $30,000 a year in salaries. It is not

practicable to compute other, ancillary costs, including subscriptions to technical periodicals, overheads, and so on, since the Research Service cannot be separated from the services of the Library as a whole. Nor can I give you a specific cost benefit analysis, partly because feedback on the results of our work is usually difficult to obtain effectively, partly because we maintain strict confidence about those for whom we provide information, although that information itself is made readily available to any other inquirer, and partly because, of all things, the value of information is about the most difficult to measure. But the total cost of the Research Service is a trivial amount for the State to pay for what is virtually the only service of its kind in New South Wales, especially when one considers what benefit has been drawn from it by industry, with profit to the State as a whole.

In any event, such information as we can gather about the results of our work seems to establish pretty clearly that its economic value to industry, and to the country, must be measured in hundreds of thousands of dollars as a minimum. We make about 400 detailed searches a year, bringing together 10,000 or more references. These have ranged recently over subjects as diverse as oil refinery waste disposal, formulation of biodegradable detergents, and windowless buildings, besides aspects of chlorination roasting of ores, coal mining conveyors, and offshore ports and loading structures.

The Service is used partly by small manufacturers having little in the way of information resources of their own. Dr B.S. Middleton has pointed out that 'Access to adequate resources of technical information is a prerequisite for

efficient R & D, and one which militates against the small company which may possess neither librarian nor library'.[9] We try to neutralise this. But the Service is also extensively used by big manufacturers with well equipped technical libraries, who nevertheless can not hope to have the resources in scientific and technical information contained in the Library of New South Wales with its collection of well over 1,000,000 volumes besides other materials, including about 4,500 current serials in science and technology alone.

Here it is perhaps worth reemphasising that the great bulk of recorded information publicly available, even scientific and technical information, is in the form of what may be called library materials. It is this aspect, therefore, that bears further consideration now, especially because of government sponsored moves to examine the need for what may become an Australian national scientific and technological information service. A service of this kind would necessarily be concerned not only with published information in the traditional forms but with computerised services, including selective dissemination of information, or SDI.

All of us in this country whose business is the provision of information, have long been concerned about the 'non system' in providing information for industry, as for other users. The present moves towards something more systematic developed from a meeting of the New South Wales Book Resources Committee of the Australian Advisory Council on Bibliographical Services, 'AACOBS', held in December 1969. At that meeting, Mr J.J. Graneek, the Librarian of the Australian National University, pointed out that as far back as 1965 AACOBS had resolved to 'request the National Library and CSIRO jointly to examine the extent to which the functions

of a national library of science and technology are being carried out, and the lines upon which these may be developed by the extension of present activities or by alternative means, including the establishment of bibliographical or referral centres for science and technology'. This was immediately taken up again by the Standing Committee of AACOBS.

The subsequent sequence of events is now of historical interest. The essential fact is that, with the approval of the Prime Minister, the Council of the National Library appointed a Scientific and Technological Information Services Enquiry Committee, known as 'STISEC', which held its first meeting on 12th March 1971 under the following terms of reference:

1. Investigate the national need for scientific and technological information services in Australia, particularly from the user viewpoint.
2. In relation to the national need, examine and report upon:
   (a) The general availability of scientific and technological literature and in particular, the major deficiencies in that resource.
   (b) the means by which access to existing resources, including unpublished material may be improved by the development of union catalogues, interlibrary loan, photocopy, translation, location and other services of traditional library type.
   (c) information retrieval systems either in use or not yet available in Australia.
3. Suggest means whereby needs identified by its enquiries may be met in the national interest.

The chairman of STISEC is now Sir Samuel Jones, Managing Director of Standard Telephones and Cables Pty Ltd, following Sir Peter Crisp who retired through ill health. Its ten other members include scientists and engineers from government, education, and industry, and two senior librarians. STISEC has already conducted a survey or user needs in scientific and technological information and a survey of library resources, the results of which are now being collated and assessed. But even the preliminary results, which must be taken with great caution, are of some interest and encouragement in that they seem to suggest that information resources and services in Australia are rather better than most people appear to have thought.

What the outcome will be, or whatever the forms in which STISEC might propose a scientific and technological information service, are of course quite unpredictable at present. But I feel fairly confident that a practicable plan will be developed, and that with the increasing interest in industry taken by government, and the increasing recognition by government of the need for adequate information, there may well be developments that will quite revolutionise the provision of scientific and technological information in Australia, for industry quite as much as for others.

There is indeed something of an example before us in the development of the Canadian national scientific and technical information system under the National Science Library of Canada. There is not scope to deal with that here except to say that the National Research Council of Canada is the agency responsible for promoting federal participation in the development of a national network of scientific and technical information, whose services include SDI to about

700 subscribers throughout the country, making use of about 9,000 periodicals covering most fields of science and technology. This service is, of course, necessarily provided through an automatic data processing system.

To sum up: historically, the role of government in the supply of information to industry has been manifested in a variety of ways. It has embraced the supply of information derived from original research sponsored by government. It has commonly been shown also through advisory services to meet specific needs and through government publications of various kinds. Moreover, it has also been manifested through the provision of what might be thought of as resource services, including the great reference libraries such as the Library of New South Wales, and the technical libraries of government departments. Governments also subsidise the public libraries provided by local governments, which are becoming increasingly useful sources of information for industry, while all library services benefit from central bibliographical services provided under government auspices.

The evidence suggests, however, that the available services and resources are largely lacking in coordination, and that they are unsystematically used. But perhaps this is the fault of industry as much as it is of government: there are grounds for supposing that the benefits that can result from the use of scientific and technological information services are not yet widely enough understood by scientists and engineers in industry, nor are the ways in which these services can be most effectively used.[10]

Whether what government now does is adequate, may nevertheless be questionable. It may also be open to doubt that government interest in information for industry is

growing fast enough. But the provision of more and better information, or of anything else by governments, is, as I have already suggested. political in the last analysis. If industry, having regard to the need, does not itself know how little it knows, how much it needs to know, and how much is available to it, and if industry therefore shows little sign of demanding, and of supporting demands for, more from government sources than it does now, it can scarcely blame governments for not giving it more.

Fortunately, our experience in STISEC indicates that, besides the libraries working through AACOBS, there are professional societies, including the Royal Australian Chemical Institute and the Institution of Engineers, that are seriously advocating the establishment by government of an Australian national information service for science and technology. This may well prove to be the most significant advance of its kind yet made in this country.

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DISCUSSION ON THIRD PAPER

Charge for services

(Lord Mayor). Mr Richardson, you mentioned S.D.I. subscriptions in Canada. Does that mean that people pay for services? (Mr Richardson). Yes, a nominal subscription of $100 p.a. for which an interest profile is compiled and bibliographical data are extracted and supplied accordingly. A question being considered by STISEC is whether there should be any charge for services in Australia. Personally he opposed charges and considered that access to information should be free.

Source of information

(Professor Hall). Wouldn't it be possible for a manufacturer establishing in Newcastle to prefer guidance from the Hunter Valley Research Foundation than from government publications? Shouldn't such a local body be used and assisted more by governments? (Mr Richardson). Newcastle is a special case. A local body would be preferred where it was capable, but knowledge knows no boundaries. Information on the same industry elsewhere would be needed. (Dr Hosking). The Hunter Valley Research Foundation would provide specialised local knowledge from its own resources but would still need access to wider sources for backing up purposes.

Appreciation of information

(Mr Flowers). Before a government can find out what it can do for industry, shouldn't industry know what it wants? Many industries do not help themselves enough with their own libraries. (Mr Richardson). STISEC's publicity has not brought much feedback opinion from industry other than

through individuals and professional associations. (Mr Smith). In Pittsburgh, Pennsylvania, the Carnegie Free Library uses a subsidised motor van to take samples of recorded information to industries, to show them its value. The motive and subsidy emanate from the U.S. State Technical Assistance Act. Would such practical demonstration serve to show industry here the value of information? (Dr Hosking). Certainly correspondence is insufficient and practical demonstration is desirable. Members of the Industrial Library Advisory Committee should be disciples and missionaries in convincing industry of the need for information service. The members should be briefed for this purpose. (Lord Mayor). Agreed. People often do not know that information is available, or even that they have need for information. (Mr Richardson). The unfortunate fact is that research workers are not taught the value of information well enough. (Mr Flowers). Students should be shown how to find facts, not just be given them. Staffing shortages prevent university libraries from giving enough of this instruction. It would be hard for librarians to approach and convince top management of the need for information; such approaches would be better coming from a body such as STISEC.

Limitation of libraries

(Dr Lean). The discussion praises libraries and criticises industry. Industrial research is competent and is impeded by the slowness of libraries in supplying requested information. There is need for a properly organised information service at the national level. (Mr Richardson). What does Dr Lean consider to be an acceptable time lag in the supply of books from a library? (Dr Lean). Ten days unless the request is stated to be urgent. Australian

library resources are insufficient and are not available quickly enough.

INFORMATION FOR INDUSTRY, THE LOCAL SCENE

by Mr R.B. Martin, Chief Librarian and
Information Officer,
John Lysaght (Australia) Limited, Newcastle

The aim of this paper is to trace the development of the cooperation which exists in the Newcastle region from its inception to its present stage and to explain how the Newcastle Industrial Library Advisory Committee was formed and operates, and what has been achieved to assist industry and commerce in this area with their information problems.

1. Historical development

The development of cooperation in the Newcastle area has been previously described in considerable detail by C.E. Smith in his paper presented at the 13th Biennial Conference of the Library Association of Australia in Canberra, 1965.

Briefly, cooperation was fostered by a conference held in 1952 under the auspices of the N.S.W. Branch of the Library Association of Australia. The purpose of this two day conference was to maximise the use and usefulness of the, then, limited library and information resources of the region. As is the intention of this seminar, the major business was undertaken by non librarians, representing educational, institutional and industrial organisations throughout the Hunter Valley.

The significant result of this 1952 conference was cooperative devices of interlibrary loans, union catalogues and exchange of duplicate materials, all of which have continued to the present time.

However, the next major advance was in 1961 when the Newcastle City Council requested the Library Board of N.S.W.,

which is the body administering the N.S.W. Public Library Act, to inspect and report on the Reference Library in the Newcastle Public Library. The then Secretary of the Board, Mr R. McGreal and the City Librarian, Mr C.E. Smith, made a survey of the Reference Library, and others in the area, and subsequently a report was submitted by the Board to the City Council, and was adopted in its entirety.

The significance of the adoption of the report is that it encouraged the Reference Library to cater for the information needs of industry and commerce and to build up its bibliographic services. In addition, harmonious relations that existed for many years between local libraries of all types were improved, by avoidance of competition between libraries, subject wise, so as to eliminate unnecessary duplication.

The adoption of this report stimulated cooperation in that it has led to frequent contact between the various librarians and libraries in the area with respect to rationalisation in acquisition of the more expensive library materials, mainly books and periodical subscriptions, to ensure the widest subject coverage in the area with the funds available.

Other arrangements which have emerged from this cooperation relate to such aspects as cooperative storage of older and less frequently used materials. In common with most libraries, those in the Newcastle region experience the problem of insufficient space for growing collections. The smaller industrial libraries in particular suffer from this trouble which is generally overcome by culling and discarding surplus and lesser used stock. To ensure that the information contained by the discarded material is not irretrievably lost to the region, a programme whereby culled stock from the

smaller libraries is sent to either the University or Newcastle Public Library for assessment and storage was commenced. In addition, the Newcastle City Council made available an old building in Wickham for use as a store for little used books. This Repository was available for use by any local library, but was administered by the Newcastle Public Library and helped to relieve the storage space problem, mainly at the Newcastle Public Library and the University Library. This cooperative storage venture appears to be the first of its kind in Australia.

With regard to cooperation in acquisition, it is inevitable that every library must serve its own needs, and the needs of its parent organisation, in matters of acquisition policy, and in any given area there will inevitably be some duplication of stock. However, cooperative or, better perhaps, rationalised acquisition occurs with many subjects and types of material. For example, when ordering new periodicals, subscriptions to which are rising in cost at a rapidly escalating rate each year, consideration in selection is usually given to whether any local library holds a particular title, or may be considering ordering it. Such direct consultation can often decide which library places the order. Furthermore, several of the larger industrial libraries such as BHP Central Research Laboratories and my own organisation, John Lysaght (Australia) Limited, have an arrangement whereby certain periodical titles are kept for a few years, after which they are transferred for permanent preservation either to the University or Public Library, according to subject interest; the latter libraries do not take subscriptions to these periodical titles.

In addition, there have existed informal guidelines for acquisition of special materials by the various cooperating

libraries, such as newspapers, trade catalogues, company annual reports, parliamentary publications, university calendars, standard specifications, patent specifications, etc..

This background of developed cooperation in acquisition, disposal and storage led to improved services to clients, which, of course, was the object of the exercise. The major advances over the years have been associated with union catalogues, mainly the union catalogue of monographs which is located at and maintained by the Newcastle Public Reference Library. Begun in 1955, the union catalogue now contains approximately 140,000 entries which presently grow at a rate of approximately 20,000 per year from 13 contributing libraries. A survey of current usage reveals that it is consulted for 2,000 titles each year, of which 500 or 25% are located. The catalogue is available to all persons and organisations in the area, and simply by writing to or telephoning the Reference Library, it is possible to ascertain quickly whether a particular monograph is available locally.

The availability of the union catalogue of monographs, together with the informally agreed subject specialisation in the region, e.g., information on economic aspects of industry and commerce is handled by the Reference Library, while information on scientific and technological aspects of industry is handled by the University, Technical College and large industrial organisations, has led over the years to a very high volume of interlibrary loan activity within the area. This has been assisted by the geographic compactness of the near city areas, with many of the large institutions and industries being no more than approximately eight miles by

road apart, and whereby reliance on postal services is obviated by using driver/delivery services maintained by many of the organisations concerned. The interlibrary loan system has developed to the stage where cooperating organisations will loan to each other material which would not normally be loaned at all.

2. Recent developments

The most significant recent development in cooperation in the Newcastle area has been the formation of the Newcastle City Council Industrial Library Advisory Committee, under whose auspices this seminar has been organised.

During an extensive overseas study tour in 1968, the City Librarian, Mr C.E. Smith, visited several industrial cities in the United Kingdom where some liaison to improve the availability of industrial and business information between Councils, firms and institutions existed. Examples are Bradford, Manchester, Sheffield, Luton and Liverpool, the latter having a formally constituted organisation known as the Liverpool and District Scientific, Industrial and Research Library Advisory Council, LADSIRLAC, complete with membership subscriptions, annual general meetings and executive committee called the Industrial Liaison Committee. In a proposal submitted in Mr Smith's report, the Newcastle City Council in 1969 approved the establishment of the Industrial Library Advisory Committee along the lines of the examples set by the English cities in effecting liaison between bodies concerned to improve the supply of information to business and industry in the Newcastle Region.

The inaugural meeting was convened on 12th August, 1969, to which the Newcastle City Council, Newcastle Chamber of Commerce, Newcastle Jaycees, Northumberland Centre of the Chamber of

Manufactures of N.S.W., Hunter Valley Research Foundation, University of Newcastle, Newcastle Technical College and twelve of the largest firms in the area were invited to participate.

The primary objective for which the Committee was intended was to formalise the informal cooperation which had existed for some seventeen years, by regular meetings of representatives of all organisations concerned. However, there were also some specific objectives such as promoting the informational use of libraries in the area and the preservation of older literature and not wanted literature, including material of a historic value relating to early history of companies and industries in the area to supplement the Public Library's Local History Collection. The most significant specific objective was for guidance from industry and commerce in acquisition policy of the Reference Library to ensure that the informational value of the Reference Library to business and industry was maximised.

It is indeed in this latter area that some of the most significant decisions and actions have been taken. Resulting from resolutions of the Industrial Library Advisory Committee, the following have been achieved:

(a) The annual reports of over 1,300 Australian companies are now stocked at the Reference Library for consultation by interested parties.

(b) Following strong representation to local Federal Members of Parliament and the Federal Attorney General, the Reference Library is now supplied with a free set of Australian Patent Specifications in microfiche form with weekly additions. This has been of great benefit to local industry, as copies of patent specifications can

now be obtained within twenty four hours, compared with several weeks if ordered through the Patent Office.

(c) The statutes of the Commonwealth and all States are now stocked by the Reference Library. This has proved to be of great value, not only to industry, but to members of the Legal Profession in the area. In addition, one local industry decided to subscribe to the Government Gazettes of all Australian States which, after a short period, are passed on to the Reference Library for general use as supplements to the Statutes.

(d) A list of translators in the district has been compiled at the Reference Library. Particulars included in the list are name, address, telephone number availability, language(s), subject specialities, if any, and indicative charges. By simply ringing the Public Library, the names of persons who can handle a desired translation can be rapidly ascertained. This is most important for businesses where rapid access to information contained in foreign language communications are concerned, a known example where this service was invaluable being a call for tenders from a European based company for subcontractors to supply components for a project in Western Australia; to meet the tender deadline, specifications and materials lists needed to be translated in a matter of days.

(e) A joint venture between the Reference Library and one industrial firm to establish at the Reference Library a comprehensive set of directories of both Australian and overseas companies.

(f) At the recommendation of the Committee, the University of Newcastle Library has undertaken the compilation of a Union List of Serials held in the region; this list will

be published by the end of the year. A similar local union list was published in the late 1950's and early 1960's, but was discontinued for various reasons, not the least being time consumed in regularly updating and distributing amendments, in 1964. However, by use of modern EDP techniques available at the University, the publication and regular amendment of a Union List of Serials became economically feasible and highly desirable. This new list will contain some 11,500 serial titles held by the libraries of nineteen different organisations ranging geographically from Wyong to Raymond Terrace and west to Cooranbong and Cessnock.

Copies of this Union List of Serials will be distributed automatically to contributing organisations and copies will be available to others if they so desire. This is just another step in making the information resources available within the region more readily accessible to those who need it.

The Industrial Library Advisory Committee has made significant advances in its objectives of coordinating the stock of information and making it more widely known and accessible. It realises, however, that any success which it may have is dependent upon the fullest support and cooperation of its member organisations. The membership has been continually widened since inauguration, with the Central Coast Regional Group of the Library Association and several large firms in the Port Stephens Shire area now being represented. In addition, invitations have been extended for many other organisations in the area to be represented, such as governmental and semi governmental instrumentalities as

well as the local branches of professional and learned societies.

With the seemingly ever increasing cost of handling and supplying information, the work of the Committee in the area is important. In conjunction with the local Group of the Library Association, advice is readily available to any organisation in the area which may be interested in establishing their own library or information service. There has been a marked growth in the number and standard of industrial libraries throughout the region in recent years. This can be attributed, at least in part, to the promotional aspect of cooperative atmosphere which exists in the area, whereby organisations have become aware of either the value of establishing and maintaining their own library or information service or of deficiencies which existed in existing internal sources through lack of trained staff, insufficient expenditure to allow the organisation to function properly or restriction on participation in cooperative projects, all of which place quite severe restrictions on the effectiveness of a small library/information service.

In summary, then, I can best express myself by saying that information handling and supply is an expensive business, but lack of information can be an even more expensive one. We in the Newcastle area are attempting to maximise, collectively, the value obtained from revenue expenditure on the supply of information on a regional basis. Achievements over the past eighteen years have been impressive, if not spectacular. Obviously there is more to be done and the work of the Industrial Library Advisory Committee, and all connected with it, must go on if we are to keep abreast of other developments in a rapidly changing environment, both technologically and in the information field. I can only plead for all

organisations in this industrially and commercially oriented region to lend their full support to what we are trying to achieve; we sincerely believe it is to the benefit not only of business and industry, but to the man in the street, by improving access to information, the standards of services offered and hence the advancement and growth of the region.

DISCUSSION ON FOURTH PAPER

Library cooperation

(Mr Groenewegen). Librarians are primarily responsible to their own clientele. How can they reconcile this responsibility with that to other libraries implied in cooperation? (Mr Martin). One's own library has priority, yet experience shows that local libraries are prompt in dealing with each other's request. The work has to be organised accordingly, and if the staff is large enough one person is given the duty of dealing with interlibrary loans. (Mr Richardson). The National Lending Library for Science and Technology at Boston Spa does not provide information, but provides material and does that well. STISEC is looking at the problem of providing information as well as material. One possible way of doing this would be to work through a regional coordinating authority specially subsidised by the government to provide photocopies of required information within a limited time. Local cooperation such as there is in Newcastle is important and its principles and practices could be developed in other areas. (Dr Hosking). Cooperation does mean working for others as well as having others work for you. There is an all round gain. (Mr Flowers). The University of Newcastle Library supplies about 3,000 interlibrary loans per year about half of which are made to local libraries and the other half to libraries elsewhere. This service is justified because all tax supported libraries form part of the nation's resources. What is needed now is a national collection in science and technology to strengthen the existing library collections on a line with the National Lending Library for Science and Technology. (Mr Smith). Delegates and others

would be welcome to visit the Public Reference Library, and probably other local libraries, to see for themselves what services are available.

Library research service

(Mr Neale). It seems essential for a region to have a literature research service along the lines of that provided by the Library of N.S.W.. Does the Newcastle Public Reference Library provide such a service? (Mr Smith). Yes, with the qualifications that the library's resources are much smaller than those of the Library of New South Wales and scientific and technical subjects in the main are deliberately excluded because of their coverage in the libraries of the university, technical college and industries. The Reference Library specialises in background information for industry, especially of a business and economic character, and this service is well used by some industries, notably those with their own information services or libraries. (Mr Mort). Would it stock books, e.g., on quality control? (Mr Smith). Yes. (Lord Mayor). Would it appeal to other libraries for assistance in supplying information outside its own resources? (Mr Smith). Perhaps the most diplomatic answer is that cooperation is effective. (Mr Flowers). The University Library does not undertake researches for staff or students because of its function to teach research techniques. This instruction is also given to other people such as industrial library liaison officers. Research officers are welcome to visit the library and consult materials such as Chemical Abstracts.

Preservation of older literature

(Mr Richardson). Most information required for industry appears to be recent, but there is still a need for older

literature which sometimes is the only source for required information. E.g., a recent inquiry dealt with by the Library of New South Wales concerned the Gompertz curve now popular in business forecasting - the original paper on this is in the Philosophical Transactions of the Royal Society for 1825, which are in the Library of New South Wales. Newcastle will need to have resource in depth of the older information and should build and preserve collections of older material without unnecessary duplication. (Lord Mayor). The Newcastle City Council is aware of this need and hopes soon to make additional storage room available for the Reference Library. (Dr Lean). The delays in obtaining information from libraries referred to earlier sometimes stem from lack of the older literature.

Interlibrary loans

(Mr Mort). Is a book requested on interlibrary loan necessarily supplied and, if it is supplied, is it then lent to the reader or must he read it in the borrowing library? (Mr Smith). Every library must look after its own interests first in deciding whether or not to lend a book. A variety of approaches is possible. The reader may be permitted specially to visit the holding library, and he may or may not be permitted to take the book out of a borrowing library. (Mr Flowers). Each library observes the special conditions imposed with interlibrary loans.

CLOSING OF THE SEMINAR

The Lord Mayor in closing the seminar expressed thanks to all for attending; to the discussion leaders for their preparation of papers and guidance; to the University through Mr Flowers for its general assistance, accommodation, and arranging of teas and luncheon; to the City Librarian for proposing that the seminar be held; and to the Industrial Library Advisory Committee for their assistance to the City Council generally and specifically in respect of this seminar.

He expressed the hope that existing cooperation between industries and other organisations would strengthen and continue. The most important conclusion from the seminar is the necessity to sell to many industries the idea that information is important. There is need to preserve records and information. He personally had enjoyed attending and hoped that others had found the seminar fruitful. He asked whether the seminar was considered worthwhile and whether it should be repeated, to which the delegates answered they would like another in two years' time. The Lord Mayor then wished everyone the compliments of the season.

Mr Flowers proposed two votes of thanks, one to the Lord Mayor, 'the busiest man in Newcastle', for devoting a whole day to the seminar and acting so capably as chairman, and the other to Messrs Smith, Martin and Mort for organising the seminar. Both were carried with acclamation.

The seminar closed at 4.50 p.m.

APPENDIX 1, LIST OF PARTICIPANTS

ALLEN, Miss J., Private Secretary, Conzinc Riotinto of Australia

BOTTOMLEY, Dr R.A., Assistant General Manager, Mauri Brothers and Thomson Pty Ltd

BROWN, Mr B.B., Development Officer, Eastern Nitrogen Ltd

CALLEN, Mr B.A., Research Manager, Stewarts and Lloyds Division, Tubemakers of Australia

FLINGLE, Mrs J., Librarian, Eastern Nitrogen Ltd

FLOWERS, Mr E., University Librarian, University of Newcastle

FREIJS, Mrs B., Librarian, Commonwealth Steel Co. Ltd

GROENEWEGEN, Mr H.W., Librarian, Australian Atomic Energy Research Establishment

GROVES, Mr J.C., Public Relations Officer, Broken Hill Proprietary Co. Ltd

HALL, Professor J.O., Deputy Vice-Chancellor, University of Newcastle

HARRIS, Mr C., Production Planner Estimator, Steel Mains Pty Ltd

HOSKING, Dr H.W., Research Consultant, Broken Hill Proprietary Co. Ltd

HUGHES, Miss L.M., Reference Librarian, Newcastle City Council

JOHNSON, Mr R.B., Plant Metallurgist, Titan Manufacturing Co. Pty Ltd

LEAN, Dr J.B., Research Manager, Broken Hill Proprietary Co. Ltd

McDOUGALL, Alderman D.G., Lord Mayor of Newcastle

McPHERSON, Mr M.G., Librarian, Sulphide Corporation Pty Ltd

MARTIN, Mr R.B., Chief Librarian and Information Officer, John Lysaght (Australia) Ltd

MILLERSHIP, Mr W., Chief Chemist, Davis Gelatine (Australia) Pty Ltd

MORT, Mr R., Secretary, Newcastle Branch, Australian Institute of Management

MUNNS, Mr W., Research Officer, Hardboards (Australia) Ltd

MURRAY, Miss J., Reader Services Librarian, University of Newcastle

NEALE, Mr W.H., Chief Technical Information Officer, Broken Hill Proprietary Co. Ltd

OUTTERIDGE, Mr K., Project Engineer, Hardboards (Australia) Ltd

REES, Mr. J., Senior Research Officer, Hunter Valley Research Foundation

RICHARDSON, Mr G.D., Principal Librarian, The Library of New South Wales

SMITH, Mr C.E., City Librarian, Newcastle City Council

WARD, Mr N.D., Works Manager, Steel Mains Pty Ltd

WINTER, Mr S., Senior Research Officer, Hunter Valley Research Foundation

APPENDIX 2, LIST OF ORGANISATIONS REPRESENTED

Australian Atomic Energy Commission Research Establishment

Australian Institute of Management, Newcastle Branch

Broken Hill Proprietary Co. Ltd

Commonwealth Steel Co. Ltd

Conzinc Riotinto of Australia

Davis Gelatine (Australia) Pty Ltd

Eastern Nitrogen Ltd

Hardboards (Australia) Ltd

Hunter Valley Research Foundation

The Library of New South Wales

John Lysaght (Australia)Ltd

Mauri Brothers and Thomson Ltd

Newcastle City Council

Steel Mains Pty Ltd
Sulphide Corporation Pty Ltd
Titan Manufacturing Co. Pty Ltd
Tubemakers of Australia Ltd, Stewarts & Lloyds Division
University of Newcastle

APPENDIX 3. THE OBJECT AND MEMBERS OF THE INDUSTRIAL LIBRARY ADVISORY COMMITTEE

The Committee was formed at a meeting held in Newcastle City Council Chambers on 12th August, 1969, with the object of improving the availability of information and material pertinent to normal everyday functions of industry and business of Newcastle. The underlying concept is that recorded information is essential to the progress of business and industry, and that local resources are neither as fully developed nor used as well as they might be. The Committee stimulates cooperation in the development of informational resources and promotes the use of such resources by making appropriate recommendations to each of the organisations represented.

Current members of the Committee are:

Newcastle City Council - Alderman D.G. McDougall, C.B.E., Lord Mayor (Chairman); Mr C.E. Smith, City Librarian (Secretary); Miss L.M. Hughes, Reference Librarian.
Australian Institute of Management, Newcastle Branch - Mr R. Mort, Secretary.
Broken Hill Proprietary Co. Ltd - Mr A.C. Mann, Librarian.
Chamber of Manufactures of N.S.W., Northumberland Centre.
Commonwealth Steel Co. Ltd - Mrs B. Freijs, Librarian.
Courtaulds (Australia) Ltd - Mr C. Hughes, Operations Manager.
Department of Main Roads - Mr D.L. Bailey.

Eastern Nitrogen Ltd - Mr B.B. Brown, Development Officer;
Mrs J. Flingle, Librarian.
Electricity Commission of N.S.W.
A. Goninan & Co. Ltd.
Hardboards (Australia) Ltd - Mr W.L. Munns, Research Officer.
Hunter Valley Research Foundation.
Institution of Engineers, Australia, Newcastle Division -
Mr J. Kerle.
Library Association of Australia, N.S.W. Central Coast
Regional Group - Mr M.G. McPherson.
John Lysaght (Australia) Ltd - Mr R.B. Martin, Chief Librarian
and Information Officer.
Newcastle Business Men's Club - Mr T.K.S. Cox.
Newcastle Technical College - Mr J. Brennan, Principal;
Mr P. Carter, Librarian.
Royal Newcastle Hospital - Mrs M. Sales, Librarian.
Rylands Bros. (Aust.) Pty Ltd - Mr B.S. Malcolm,
Administration Superintendent.
State Dockyard - Mr J.W. McCrum.
Titan Manufacturing Co. Pty Ltd - Mr N.K. Hullick, Senior
Metallurgist.
Tubemakers of Australia - Dr J.H. Wroblewski, Information
Officer.
University of Newcastle - Mr E. Flowers, University Librarian.

Organisations wishing to join or rejoin the Committee are invited to consult the Chairman or Secretary. Membership is free and wider representation would be welcomed.

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