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509695



TITLE

SCIENTIFIC AND TECHNICAL INFORMATION IN THE DEFENCE RESEARCH BOARD. A BRIEF
PREPARED FOR THE SCIENCE SECRETARIAT

System Number:

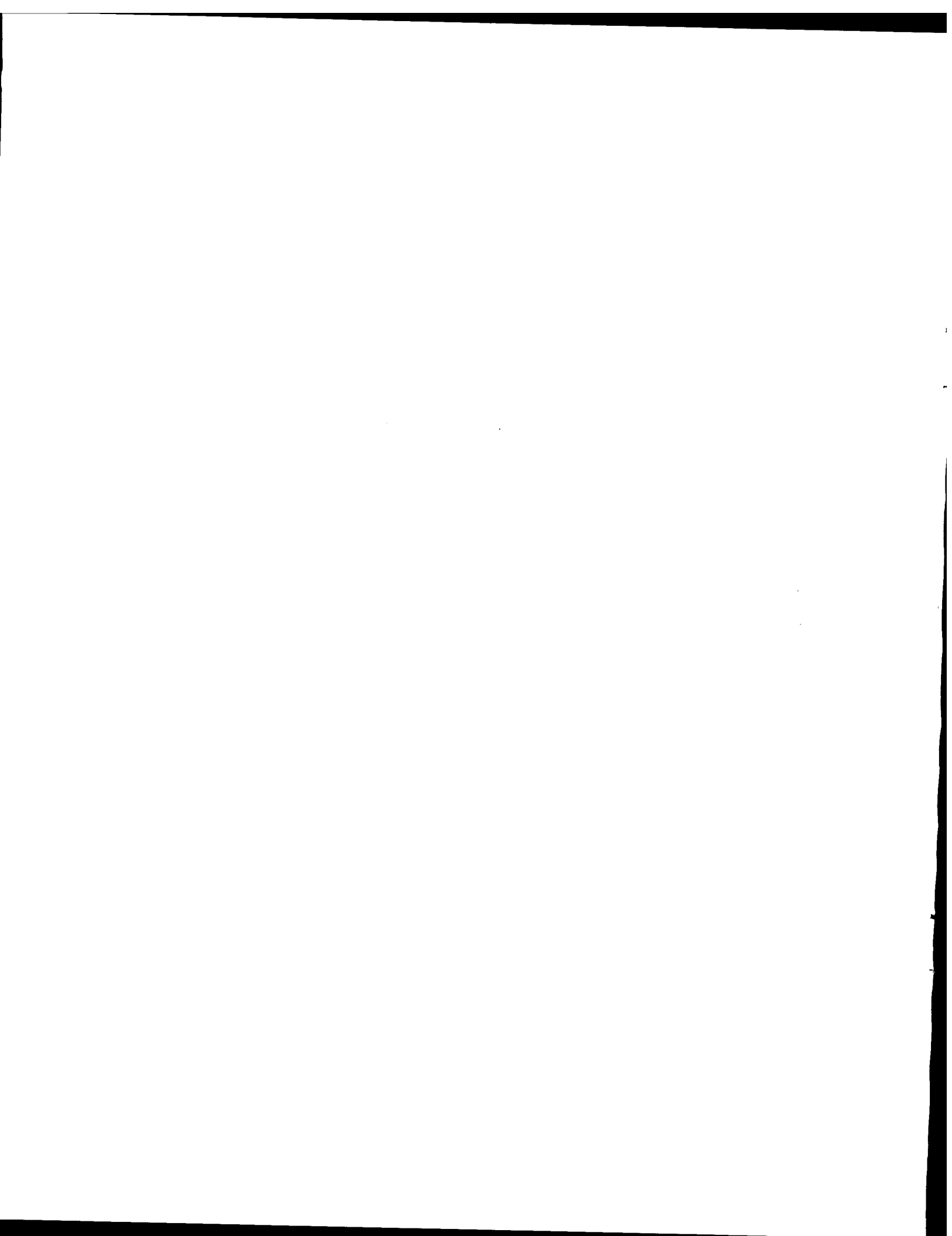
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**SCIENTIFIC AND TECHNICAL INFORMATION
IN THE
DEFENCE RESEARCH BOARD**

**A Brief
prepared for the
Science Secretariat**

**by
A.C. JONES**

**Defence Scientific Information Services
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Scientific and Technical Information
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Introduction

The two main functions of the Defence Research Board are to provide scientific advice on defence matters to the Minister of National Defence, and to conduct research that may be needed by the Armed Forces. To fulfil these functions the Board maintains a headquarters and an operations research establishment in Ottawa and seven laboratory establishments across the country. The laboratory establishments, like the Board itself, are mission-oriented, each exploring problems in a fairly well defined area of military needs. In many cases their names indicate the area of defence interests which they cover.

Information Requirements

The work of the Board involves it in the use of security-classified information, especially from other countries, and in the production of research reports of which a proportion must be classified. This is a factor that bears significantly on DRB's scientific information activities and affects many of the operations carried out and the systems used in them.

Naturally the DRB laboratories have a need for the normal published information in the various disciplines in which they work, as well as the unpublished classified information. This has led, inevitably perhaps, to a duality of information service although not to a separation. Each laboratory establishment and the headquarters complex has its own library and library staff whose prime task is to meet the local requirements in books and journals. There is little if any overlap of interest among the establishments and no particular benefit in centralising this operation. Thus each library does its own ordering and cataloguing.

The converse is true for classified documents or documents whose availability is limited in other ways. Normally when a country agrees to release a piece of classified military information to an ally, it will do so only once, and in a very limited number of copies, frequently only one. In addition, the originating country will specify that the information is to be used for military purposes only and that it should not be further disseminated without permission of the originator. The result is that DRB must have a centralised system for obtaining, disseminating and controlling this type of information, and that the system must provide for the needs of all defence users and not merely those of DRB's establishments. For this purpose DRB maintains the Defence Scientific Information Services (DSIS). DSIS provides scientific and technical document information services to all branches of the Department of National Defence, to the Armed Forces, to the Department of Defence Production and its defence contractors, the Emergency Measures Organisation, and to any other departments or agencies of government co-operating in defence research, as required. The same services, with some additional ones mentioned later are also provided to DRB's own establishments, the establishments' own libraries acting as local agents for DSIS in this. DSIS' mandate is, of course, limited to providing information for defence purposes.

Library Operations

Each library unit has a librarian in charge with two or three assistants as required by local conditions, giving a nominal strength of 8 professional and 20 supporting staff for this part of DRB's information activities. Attached at Annex A are figures for the year 1965-66 showing the purchasing of books, periodicals, reprints of papers published in the open literature by each laboratory and a few miscellaneous documents not provided by DSIS. The totals for DRB for last year are 1,864 new titles, 2,409 volumes for a cost of \$39,636, and 2,380 periodical subscriptions at a cost of \$71,216. Most of the other costs involved are borne by DSIS on behalf of all users of the services and are not readily separable.

All the library units have access to copying facilities, and have equipment for reading microform material. In a number of cases reader/printer equipment has been installed for use with microfiche. The microfiche themselves are provided by DSIS. DSIS also has equipment for duplicating microfiche, as well as for reading them.

Each of the laboratories has a data processing centre with a computer geared to meet the particular needs of their research program. Ways in which the data centre can help the library with information work are being studied at most of the laboratories. On a wider front, in conjunction with work on computerisation of DSIS'

services, the compatibility of the products with the data processing facilities at each laboratory is being studied.

DSIS Operations - Document Information

The special nature of much of the documentary information affects the whole operation. The normal approach of announcing all accessions to all likely users cannot be followed, and a selective dissemination system (SDI) has seemed inevitable. It will be appreciated that a selective acquisition system is equally inevitable, as the need for many of the documents has to be demonstrated to their originators before they can be obtained.

The mainstay of the system is a group of ten information scientists each covering a field defined partly by discipline, partly by military application. Each information scientist has an allotted group of users, and must try to keep up to date with the work they are doing and the information they are likely to need in the near future. He must explore possible sources of the information, and try to obtain release of relevant documents, a process which often takes many months. When documents are received, he must decide who should see them and in what order of priority. Further reproduction of classified documents is not normally done, except by permission of their originators. He must see that each document is catalogued, abstracted and indexed for future retrieval. He may use the catalogue cards as part of the SDI system, for those users who want to decide later whether to read the reports.

The process for producing the catalogue cards is made to serve two other purposes. A three-part work card is used. After completion of the documentation process, one part goes to the printers, a second to guide the distribution section, and the third to the document control and storage section. The latter must keep track of each copy of a classified document until it is destroyed.

The catalogue cards are used directly and indirectly to provide an announcement service. They are sent to certain users as part of the SDI system. They are also used to produce a two-part accession list each month, one part being classified, the other containing those documents which can be allowed a wider circulation. At present these accession lists are not indexed, and therefore contribute very little to any retrieval process.

The main element of the retrieval system is the central catalogue in DSIS. Requests for individual documents are met by the documents control staff and the catalogue staff. More complex requirements are met by the appropriate information scientist, who will prepare bibliographies from DSIS holdings,

or select actual documents, as appropriate. Qualified users are encouraged to use the catalogue themselves, as this usually produces a more satisfying result.

The number of documents processed averages close to 20,000 per annum. Holdings in DSIS are now about 340,000. In addition to these, about 20,000 other titles per annum of unclassified material are obtained in microfiche form from the US Federal Clearinghouse for Scientific and Technical Information. As indexed accession lists of these are available to any interested users, DSIS merely holds the microfiche and distributes reproductions to DRB laboratories or other defence users on request.

DSIS Operations - Other Services

Editing and publishing of all material prepared in or for DRB headquarters is done by DSIS. Professional advice is provided to the laboratories in the preparation and editing of their research reports. The distribution of all DRB reports is centralised in DSIS. An average of about 700 titles are distributed per annum.

A Translations Section works on foreign scientific literature related to DRB's research interests, much of it being Russian or Chinese material. When translations are made from papers in the open literature, and no copyright problems arise, DSIS translations are distributed as widely as is economically feasible, and further reproduction by recipients is permitted. Forty to fifty translations are released for general distribution each year.

Each of these services is headed by a scientist.

DSIS - Staff

The information, editing and publishing, and translations services together have a nominal professional strength of 12 scientists, one librarian, one technical editor, one non-technical editor and one non-technical translator, for a total of 16. They have a technical and clerical supporting staff of about 55.

National and International Co-operation

DSIS is represented on the NRC Associate Committee on Scientific Information, as a main channel for country-wide co-operation. The nature of DRB's information work does not lend itself to much specific support to schemes outside defence, but co-ordination of Canadian participants in the UK National Electronics Research Council SDI experiment is one such task that DRB has undertaken.

On the international scene, DRB is represented on the Technical Information Panel of AGARD/NATO, and on the Commonwealth Defence Science Organisation, and provides DRB reports to NATO and Commonwealth countries. DRB also participates in The Technical Co-operation Program (TTCP) with US, UK, and Australia, and the document exchange which results from this. DRB maintains liaison offices in Washington, London and Paris through which the document flow to Canada takes place. In Washington, the liaison office includes a scientific information officer and a supporting staff of two. Military attachés and liaison staffs also help in this work.

Future Plans for DRB Information Services

Plans are still being developed for automation of all those parts of the information services that seem to justify it. They can be divided into three categories. First, there are those things connected with acquiring and circulating books and journals, which are developing separately in each laboratory. Second, there are announcement and circulation of newly acquired documentary information (SDI). The main aims are speeding up announcement, matching user profiles, and reducing manual work in sorting material for dissemination. Third, there is information retrieval, automation of which will require more drastic changes in the system. The object is to get the necessary data into machine readable form to simplify and speed up searching. Because DSIS operates a document loan system, the search capability must be backed up by a capability to locate the whereabouts of every document, so that it may be recalled.

Future Developments

Relative to the size of DRB's information services, the amount they can contribute directly to the general need is small, but whatever unclassified products are forthcoming will be distributed. DRB has no facilities for the sale of documents, and does not wish to develop any. The establishment of a clearinghouse to handle all such documents produced by government agencies would solve these problems and could develop consolidated, indexed announcements that would benefit all Canadian users. The US Federal Clearinghouse for Scientific and Technical Information has already pioneered this field and their accumulated experience has been freely offered.

The main requirement in the next decade is to develop the people to operate information services. This is going to be much more difficult than to develop the hardware. The work requires scientists and engineers, who must learn the techniques of information science. Before this can happen on an adequate scale it will be necessary to obtain recognition of the profession.

Formation of a professional society is an obvious course and could provide more than mere recognition, by setting standards as is done by societies in many other professions. This would ultimately benefit the employers and the trainers of information scientists. Every encouragement should be given to the formation of such a society by those already working as information scientists.

The need for supporting staff will be just as pressing. Most of today's experienced staff have learned on the job. This process is too expensive in time. Several provincial governments have recognised the need for more formal training of technicians for scientific information work, and are actively developing courses suitable for their colleges of technology. As with professional staff, there is much to be gained by developing an identity and a recognisable designation. Training at this level benefits greatly from periods of practical experience between the academic sessions. Government agencies can help greatly in this process not only by encouraging the educational institutions to develop the courses, but by providing temporary employment to give students the opportunity to acquire practical experience.

Information Science is a new discipline. A great deal of research is already going on, but a great deal more could well be undertaken. The Federal government can help in several ways, by evaluating research results from elsewhere, by disseminating information on research results, and by sponsoring research themselves. The National Research Council's Associate Committee on Scientific Information might be asked to study and recommend a system to carry out this work.

It is not intended to try to second guess the ad-hoc Study Group. However, it is urged to explore every prospect of meeting national needs by tapping and co-ordinating the resources of existing agencies. It is felt that this will produce a more practical result than would a proposal to develop an entirely new agency with the whole responsibility.

Library Unit	Books		Periodicals		Reprints of DRB Papers				
	No. of Titles	No. of Volumes	Cost	No. of Titles	No. of Subscriptions	Cost	No. of Orders	No. of Copies	Cost of Reprint
Naval Research Establishment, Halifax, N.S.	136	141	4,180	165	174	5,223	8	2,450	
Canadian Armament Research and Development Establishment, Valcartier, Que.	377	461	6,555	359	424	13,057	6	1,650	
Defence Research Telecommunications Establishment, Shirley Bay, Ont.	333	460	6,516	290	302	8,030	23	11,200	
Defence Chemical, Biological and Radiation Laboratories, Shirley Bay, Ont.	120	122	3,170	155	155	7,954	28	8,325	
Defence Research Medical Laboratories, Downsview, Ont.	158	167	6,766	224	224	7,396	22	12,300	
Suffield Experimental Station, Suffield, Alta.	202	218	2,512	353	358	12,985	3	2,450	
Pacific Naval Laboratory, Esquimalt, B.C.	192	221	3,417	184	184	6,036	7	2,100	
DRB HQ, Operational Research Establishment and Liaison Offices abroad	346	609	6,520	428	559	10,535	9	2,025	Included in cost of books listed in fourth column.
Totals	1,864	2,409	39,636	2,158	2,380	71,216	106	42,500	



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