

# RESEARCH and DEVELOPMENT in SURVEYING and MAPPING in CANADA

BY A. C. McEWEN

*Ed Note: The following is the text of a presentation given on behalf of the Association of Ontario Land Surveyors, by Dr. McEwen to the Conference on Research and Development in Surveying and Mapping, Ottawa. April 24-25, 1979.*

The Association of Ontario Land Surveyors welcomes this opportunity to express its views concerning the need for research and development in surveying and mapping in Canada. It is in general agreement with the findings and conclusions relating to research and development that appear in the **Report of the Task Force on National Surveying and Mapping**, May 1978. The Task Force recommended inter alia that the percentage of the Surveys and Mapping Branch's annual budget that is devoted to research and development be increased from the present 2.1% to a minimum of 5%, and that the performance of this work be equally divided between the federal government, private industry and the universities. It is interesting to note that these recommendations are in keeping with the position of the Board of Economic Development Ministers which recently stated that the federal government

"has announced its intention to strive for a significant increase in the share of national resources devoted to R & D and has set a target for national expenditures on R & D of 1.5% of GNP to be reached by 1983. The government will be looking to the private sector to take every opportunity to increase its effort in this important area."

The above quotation is taken from the federal government's formal response to the nine specific recommendations regarding research and development that are contained in **Action For Industrial Growth: Continuing The Dialogue**, February 1979.

The case for applying a higher level of national resources to research and development in areas of science and technology such as surveying and mapping does not appear to call for further argument. What is required, however, is to identify specific research projects that are urgently needed and to determine a strategy for supporting and undertaking them in the most beneficial manner. It seems evident that such a strategy can best be developed through the close cooperation of members of

the surveying and mapping profession in the public and the private sectors, and that its implementation requires a similar cooperative endeavour if it is to be fully effective.

By virtue of its statutory powers and duties, the Association of Ontario Land Surveyors is primarily concerned with the practice of legal surveying within the province. At the same time, the Association is conscious of its responsibilities as part of the larger Canadian survey community, and this is demonstrated, for example, by the Association's support of, and participation in, the Survey Science programme at Erindale College, University of Toronto, and the Canadian Council of Land Surveyors. Members of the Association are engaged in mapping, control surveys and other branches of the profession, and are frequently involved in survey operations that extend beyond provincial, and even national, boundaries. The Association's professional interests are similarly unrestricted, and it looks on research and development as a national activity that can be of benefit to the entire surveying profession in this country. To the extent that its own resources permit, the Association will continue to support suitable research projects, and it regards the present conference as an opportunity for useful discussion to bring the requirements for research and development into sharper focus and to determine the manner in which they should be met.

The Association of Ontario Land Surveyors suggests that the following topics are appropriate for consideration as areas of research and development.

## 1. Textbook on Survey Law

There is a very real need for a comprehensive study of the legal principles and practice of land surveying in Canada. The lack of an adequate treatment of this important subject leaves current survey literature with a serious gap that is felt by student and practitioner alike. A proposal for the preparation of a textbook on survey law was made to the Canadian Council on Surveying and Mapping at its meeting in Quebec City in October 1974. As a result, a committee consisting of representatives from the Canadian Institute of Surveying, the Canadian Council of Land Surveyors, the Canadian Council on Surveying and Mapping, and the Canadian Bar Assoc-

ciation was appointed in early 1975 to determine the feasibility and cost of the project.

The committee identified the various topics that should be included in the proposed publication, and also made recommendations concerning its authorship. Indications of a commitment to purchase a number of copies were received from many of the provincial survey associations, and there was an expectation that total sales would be in excess of 3,000 copies. Since 1975, no further progress has been made towards the completion of this project, partly because of the problem of obtaining the necessary financial and other resources, but the interest in this undertaking remains high among land surveyors throughout the country. There is no doubt that the proposed textbook would be of great value to the surveying and legal professions in both the public and the private sectors. Closer investigation may show that a series of monographs, in a loose-leaf form that facilitates periodic updating, would be preferable to a single hardcover work, but in whatever form the publication eventually emerges it represents a research project that deserves the fullest possible support.

## 2. Water Boundaries

One of the more obstinate problems in land surveying is the legal determination of the location of water boundaries. In many instances, it is first necessary to establish whether or not a body of water is navigable, and the test of navigability, as provided by statute and common law, is not always easy to apply. Questions of navigability, also raise jurisdictional issues, for whereas the property in the bed of a navigable river or stream is vested in the particular province through which it flows, the control of its water lies with the federal government. An associated problem is the ascertainment of high water mark as a riparian boundary, for this also is a subject on which judicial decisions are not uniform, thereby giving rise to frequent situations of confusion and inconvenience.

Although the practical problems that occur as a result of present uncertainty regarding navigability, high water mark, and related issues, can be considered as part of the overall study of survey law that is contemplated by the preparation of a comprehensive textbook, a

thorough investigation of water boundaries and riparian rights is of sufficient urgency and importance to justify its treatment as a separate area of research.

The Association of Ontario Land Surveyors has recently appointed a Committee on Water Boundaries to examine and make recommendations concerning various survey and legal aspects of riparian property in the province. With existing resources, this project may take several years to undertake, but the provision of additional support from other sources could make it possible to widen the scope of the inquiry and ensure an earlier completion date.

### 3. Case Law Studies

As in other professions, the surveyor should keep himself informed of recent developments in the law. Usually he will be made aware of statutory amendments that relate to his work, but it is more difficult for him to remain up to date with respect to judicial decisions that confirm, extend or alter the applicable law. Law reports are not always readily available, nor does a busy practitioner have the time to undertake the necessary research to extract and read those cases that may affect him.

In November 1978, the Association of Ontario Land Surveyors introduced a new service by distributing to its members summaries of recent court decisions dealing with survey, real property, planning, and allied subjects. These summaries are not mere copies of reported cases; they are specially prepared and annotated for the particular needs of the practising surveyor. Since the selected cases are not confined to Ontario but

are taken from the decisions of all the common law courts in Canada, they are of value to other provincial jurisdictions. The extension and development of this useful service would be facilitated by the injection of additional resources to provide for further research and publication.

### 4. Bibliography of Survey Literature

The increasing specialization in the fields of surveying and mapping, and the growing accumulation of published reference material, point to the need for a complete and readily accessible bibliography of survey literature. Certain bibliographies already exist, but they quickly become obsolescent, and most of them are in a hardcover form that does not lend itself to convenient updating.

It is suggested that a study be made to determine the bibliographical requirements of the surveying and mapping community in Canada, with a view to undertaking a compilation that will serve the needs of the majority of users. Consideration should be given to securing the most efficient and inexpensive methods of keeping the published bibliography up to date, whether by means of index cards, loose-leaf pages, or a computer system.

### 5. Land Information Systems

Many surveyors regret their apparent inability to gain or retain prominence in other disciplines, such as planning, where their particular expertise allows them to make an important contribution. The emergence of interest and activity in new or improved land information systems that depend on accurate geographical positioning presents the surveyor with a fresh opportunity to exert his professional skills and influence.

As providers of fundamental data regarding the spatial relationship of the physical and legal attributes of land parcels, surveyors are vitally concerned with the way in which their information is stored, retrieved and used. The pattern of future development in land information systems can be largely shaped by the awareness, interest and direct involvement of the surveying profession.

It is recommended that research be undertaken to investigate existing and contemplated land information systems in Canada and elsewhere, with a view to determining the present and future role of the surveying and mapping profession in the introduction, development and improvement of such systems.

### 6. Testing Survey Equipment

Rapid advances in the development of survey instruments and equipment over the past two decades mean that the practising surveyor is confronted by a bewildering array of choices as to the most suitable make or model for his particular use. Too often he has to depend on the advertising literature produced by manufacturers, rather than on impartial performance reports.

The publication of results of periodic and comparative testing of survey instruments, such as EDM equipment, theodolites and levels, would be of value to the practising surveyor. It is suggested that these tests should be undertaken by a government agency that has the necessary facilities, and that sufficient resources be made available as part of a continuing research and development programme.



## The Scene from 6070

BY LORRAINE SETTRINGTON

### Changes in the Official Register

May 10, 1979, White, John Edwin No. 1477 - new registration

### CONFERENCE ON RESEARCH AND DEVELOPMENT

Vice President, George Zubek and Dr. Alec McEwen represented the Association at a Conference on Research and Development sponsored by the Department of Energy, Mines and Resources, Ottawa. Dr. McEwen gave a presentation on behalf of the Association, which is printed in this quarterly. It is hoped that research money may be available for the work presently being undertaken by the Water Boundaries Committee of the Association of Ontario Land Surveyors

and the Association office is looking into this matter.

### ANNUAL DUES AND SUPPLEMENT

It has been most encouraging this past year to have both the annual dues and the \$25 supplement to the dues paid very promptly by a great majority of the membership. We still have a few members who wait until the very last minute to pay their dues and this is frustrating for all concerned. It is most unfortunate when a member finds himself suspended because of lack of payment of his dues and/or interest. We would encourage all members to see that their payments are in well ahead of time and not risk jeopardizing their standing in the Association.

### SEMINARS

A tentative list of the Seminars for the 1979/80 year is being printed in this quarterly. Notices will be sent out in early September regarding both the law seminars and the joint ACSTTO/AOLS Seminar.

### CERTIFICATES OF AUTHORIZATION

Many problems have come to light recently regarding Certificates of Authorization. This matter should be dealt with by the August or September meeting of Council and the information will be forwarded to those members who have problems in this area.

### SUMMER HOURS

Just a reminder that the summer hours at the Association offices are 8:30 to 5 p.m. Monday to Thursday and 8:30 to 12 noon on Friday. This summer we will have two summer students working at the office to assist in this work load.