

The NOVA SCOTIAN SURVEYOR



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OLD BOUNDARY MARKS

By J. E. R. March

Land surveying has entered a new phase, thanks to the new precision survey instruments, and to improved survey education. It is inevitable that a change in the system of land registration must follow. It may well be that under a developing system the blazed tree of the future could be relegated to a role of merely indicating the approximate position of a straight boundary line between two known points. At the present time, however, trees bearing original survey blazes are marking the boundaries.

The pictures shown here are of original boundary marks which were found by Mr. Edward B. Ritchie, N.S.L.S., while surveying some of the first division lines of the Liverpool Township. Mr. Ritchie is a land surveyor of outstanding ability in this type of survey work. Before he retired he was Assistant Chief Surveyor for The Bowaters Mersey Company. Some years ago he kindly permitted me to have these pictures taken and furnished me with the relevant information.

Fire, axe and disease have taken their toll, and most of the original boundary line marks on the framework from which our land pattern stems have disappeared. It is hoped these pictures will be both interesting and educational.

At first glance this appears to be merely the picture of a chip. Now note the three deep axe marks, hacked down. These indicate an old centreline tree. The dark spots are from the fire that killed the tree many years ago. The date of the big fire is known.

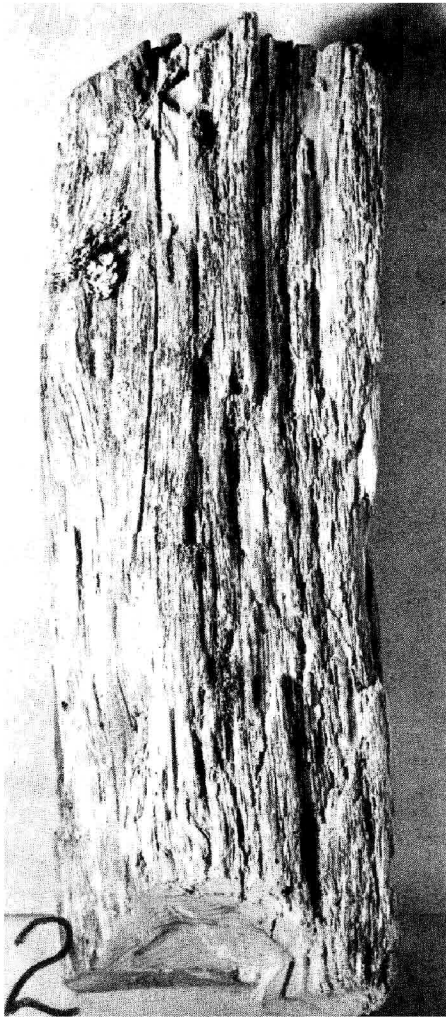
Look closely now at the lower axe mark. To the left of the hack and slightly below it you can see the curl in the grain of the wood. You may need a magnifying glass. To the experienced this shows the blaze had started to grow over before fire killed the tree, and to the expert by counting the growth rings in the curl, the exact date of the blaze is known.

(This picture is from a pine stub that was a centre line tree on the Middle Base of 200 Acre Lots, Letter A, Township of Liverpool, and is one of several located by Mr. Ritchie. By means of these he was able to re-establish a large part of the old layout in its original position.)



To the surveyor this was about the same as the prospector finding the mother lode.

Look first at picture Number 2. A hemlock stub, 16 inches in diameter. According to the surveyor's calculations this stub should have been standing on or very close to the division line between Lots 42 and 43, in the Letter "A", 200 acre Lots, Township of Liverpool. No visible signs of survey marks, but the surveyor could feel 3 slight, evenly spaced lumps on the stub. It was split open, and picture Number 3 shows the three axe marks, as revealed from inside. A perfect centreline tree, marked close to two hundred years ago.

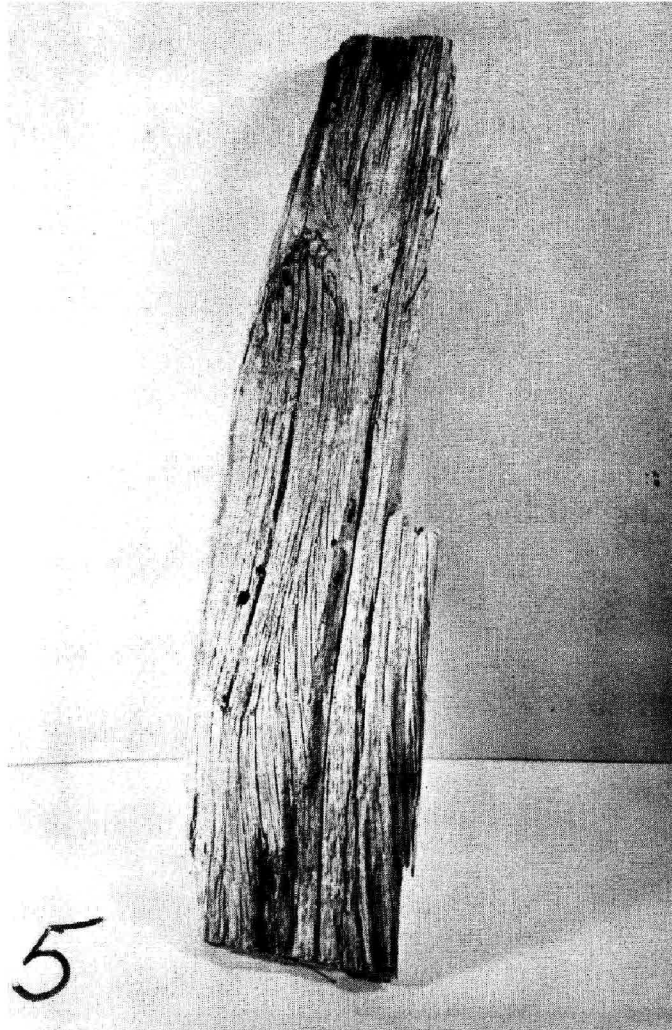


Wood taken from an original pine corner, Lot No.32, Township
of Liverpool, Letter "A", 200 Acre Lots.

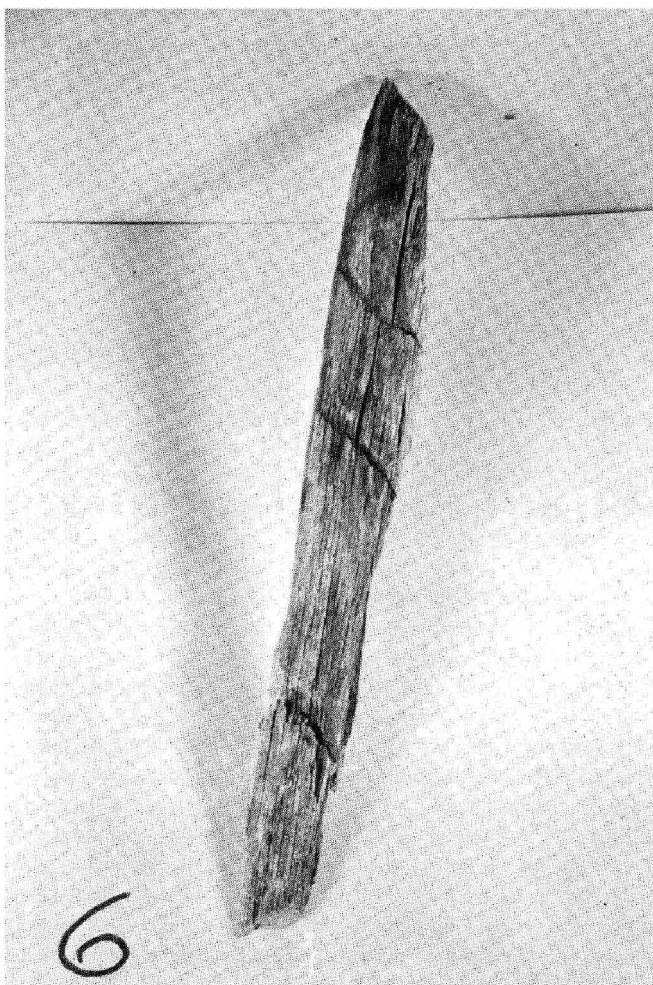
Located April 10th, 1954, by E. B. Ritchie, P.L.S.



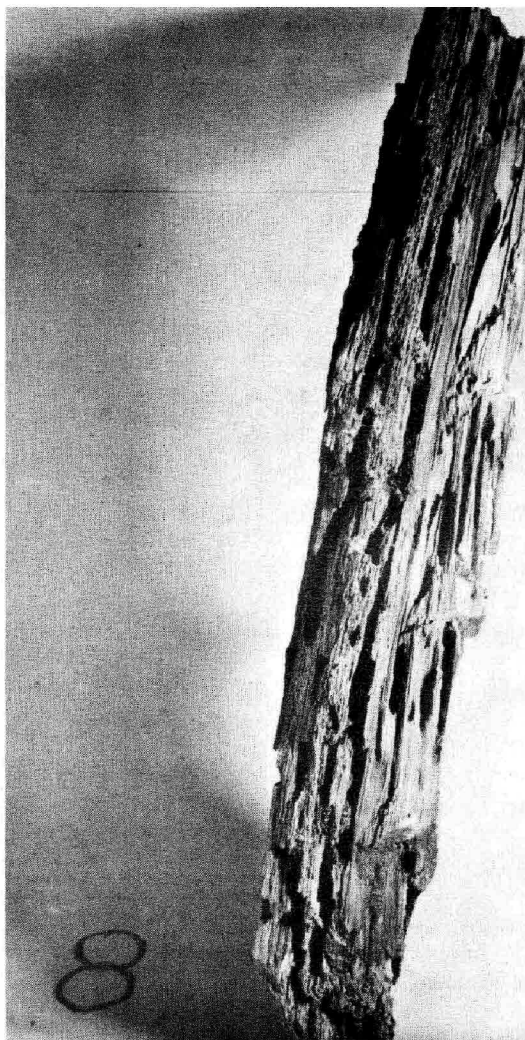
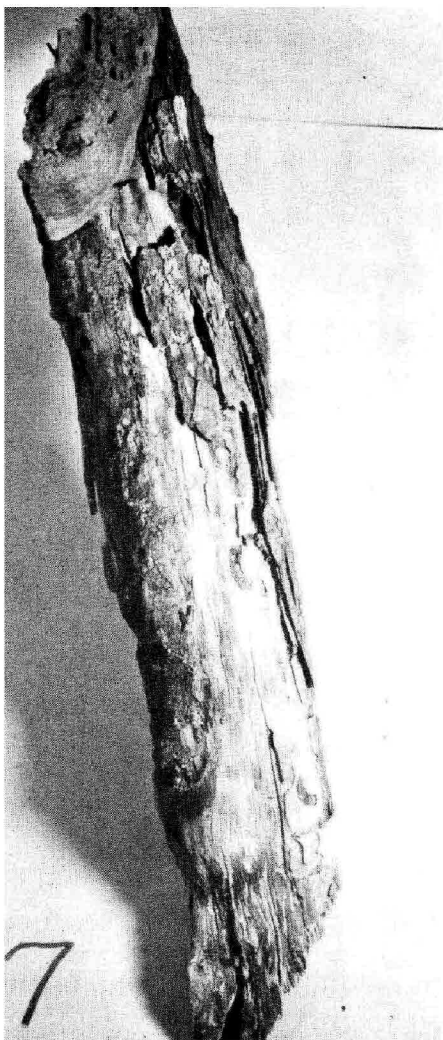
Old blaze on a line of Lot No. 16, (Liverpool Township). The figures scribed on the blaze more than one hundred years ago are still plainly visible.



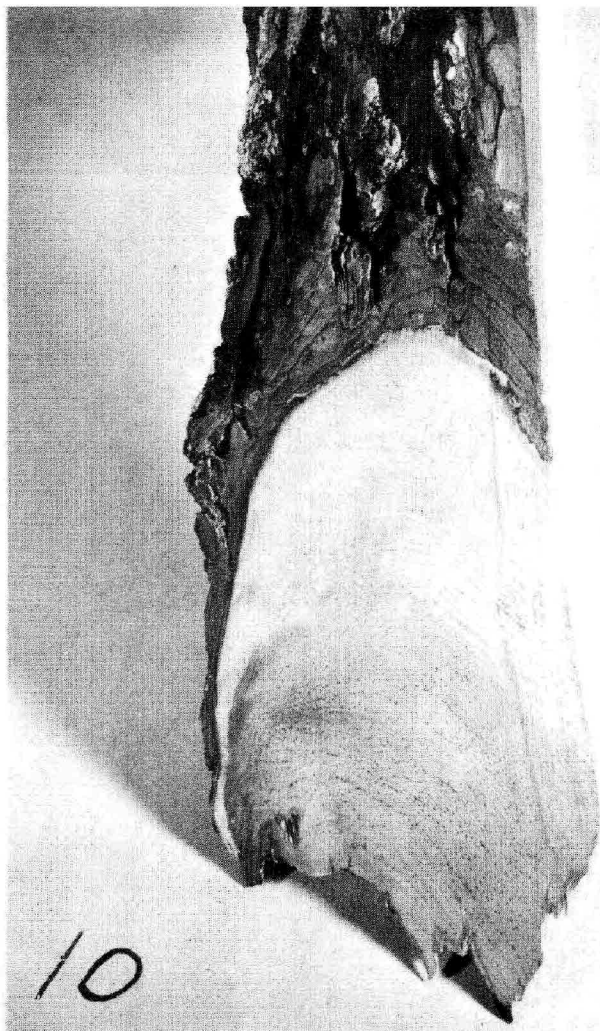
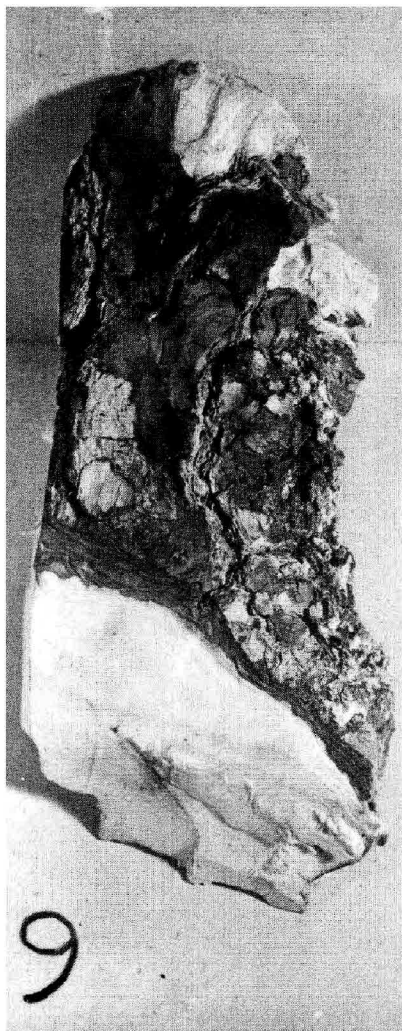
From a 10 inch pine stub on the line between Lots 24 and 25, in Letter "A", 200 Acre Lots, Township of Liverpool. (Located April 27th, 1954, by Edward B. Ritchie, P.L.S.)



Another example similar to the one shown in pictures (2) and (3). Nothing visible on the outside of the stub, but a perfect centre-line tree when the stub is carefully examined. Evidence like this may be easily destroyed when examined without proper care.



These are from a living pine tree and the survey marks are not in the picture. The growth rings were too fine to count (See picture No. 9). So the blazed section was taken to the mill and planed (See picture No. 10). Count of the growth rings shows the line was surveyed 137 years ago.



President's Address

The 19th Annual Meeting

of the

Association of Nova Scotia Land Surveyors

Since the meeting last November, when you honored me by naming me your president, I can say that this has been the busiest, most interesting, informative and rewarding year in my memory.

On your behalf I have had the pleasure and honor to represent you at meetings in New Brunswick, Newfoundland, Quebec, Massachusetts, and at the Canadian Institute of Surveying Convention in Ottawa. Our Association was well represented at the Ontario meeting by Mr. Walter Servant.

In May at the closing session of the Nova Scotia Land Survey Institute, I presented on your behalf the Major James A. H. Church Award to the first year survey student making the greatest progress.

In June, this Association was again honored and recognized: On your behalf, I was pleased to make a presentation to and speak of Dr. G. W. I. Creighton at the Testimonial Dinner held in honor of his retirement from the position of Deputy Minister of Lands and Forests.

At this point, I must say that the people I have met while carrying out the official functions of this office have taught me a great deal and it is my hope and expectation that the knowledge I have gained will be of benefit to this Association for many years to come.

As will be evidenced by the reports of committees, presentation of the proposed By-law changes and recommendations that have been made to the Board of Examiners, your Council and Committee Members have had a very busy year. Their just reward will be your approval of their recommendations. At this time, I would like to express my sincere thanks to these members of Council and Committee, without whose interest there would be no Association. I would be doing an injustice to these hard-working members of whom I have just spoken if I let you believe that all members of Council carried out their responsibilities. They have not. There are those among us who have the nerve and the audacity to let their names stand before you for election and, when elected, choose to sit at home while Council and committees are meeting. To these people - and they know to whom I am referring - I will say this: if you have not the time, interest or inclination, don't, please don't, sit on Council. Resign and make room for those who believe in our profession and this Association. There could be many reasons why this situation exists, but I feel that it is our nomination and election process. The only suggestion I can make at this time is to have the members of the various districts nominate and elect their representatives to Council - after all, they are the ones who best know the capabilities and interests of the people in their areas. And, if we take a look at our election process, we should reconsider the manner in which the Council executive is elected. I cannot help but admire the method used in Quebec where the executive is elected by the Council.

My visits to other association meetings have only confirmed my long-time belief that those in private practice are the ones who should be offering leadership to this Association. It has become very obvious that not enough effort is being made by these members. I can count on one hand the number of surveyors in private practice who have made a contribution to this Association since its inception.

With all due respect to those of you who work for the different levels of government, private corporations and educational institutions, and have worked so hard for the formation and continuance of this Association, I must ask those in private practice to give some serious thought to this question: Are you willing to let those who are not fully acquainted with the everyday problems connected with your business sit in judgment and make rules, regulations and propose laws that will govern the manner, method and procedure under which you will work? You are the members who know best where the problems lie and it is obvious that you are the ones to bring in the solutions. Without your interest and participation, this Association will be relegated to that of a Social Club.

Your Council this year has not proposed any changes in the Act. We have been living with this Act for the past ten years and it has had few, if in fact, any significant changes. All of us are very much aware that changes are necessary for the sake of good survey practice and for the protection of those who require the services of our profession. Changes have not been proposed this year because the Provincial Government is drafting a new Surveys Act, which, for one part, will establish ground rules for the use of the new Coordinate Control Survey System. I feel that both Acts must be perfectly dovetailed to provide the best possible survey education system and the best possible service to the public. This can only be achieved with complete cooperation between the Provincial Government and this Association. I sincerely hope and trust that when the new Surveys Act reaches the first draft, it will be presented to this Association for study and comment. Then, and only then will we be able to design an effective and meaningful Act that will permit professional surveyors to give truly professional service to the people of this Province.

The Atlantic Provinces Surveying and Mapping Program is one of the most ambitious and significant events in the history of surveying. Tomorrow, Mr. Bert Robertson, the Director of Surveys for the Dept. of Lands and Forests, will tell of the progress that has been made in Nova Scotia on the first two phases of the program. Also, Mr. Willis Roberts, Technical Director of the "Program" will stir your imagination when he tells of the research and of the proposals about to be adopted concerning the third phase of the "Program" which will establish a Computer Based Land Titles System.

We are in an era of rapid change and we have a deep responsibility to our employers, our clients and this profession, and it's time that each and everyone of us took a long hard look at our abilities and position to find out if we are keeping up with the advances in survey technology.

Roy A. Dunbrack
President

ANNUAL REPORT OF SECRETARY-TREASURER

Mr. President, Guests and Members;

Before beginning my report, I would like to extend my own personal welcome to all our guests who are honoring us with their presence here at our 19th Annual Meeting. It is my sincere wish that you will find your stay interesting, pleasant and enjoyable.

I also wish to thank the exhibitors, not only for coming, but also for their promptness in replying to our invitation to exhibit. Your exhibits are very much appreciated and contribute greatly to the success of our meetings. This year we have a total of eight exhibitors of which one is exhibiting for the first time.

The credit for organizing this meeting goes to the 19th Annual Meeting Committee which is composed of our President, Mr. Dunbrack, Vice-President, Mr. Streb, Mr. Robert Feetham and Mr. David Hiltz. I wish to express my sincere thanks to this committee for their cooperation.

The present membership statistics of the Association are as follows;

	<u>Last Year</u>	<u>This Year</u>
Honorary Members	6	6
Honorary Life Members	10	12
Non-Practising Members	19	20
Associate	2	2
Practising Members	176	180
Arrears	29	31
Total	<u>242</u>	<u>251</u>

There were eleven new members accepted this year. Two members passed away, making a net increase of nine members.

The Roll of Members was published in May of this year and distributed as in previous years. The Roll this year was amended so as to indicate those who were available for private surveys.

The executive and Council continue to encourage the use of the Association Professional Stamp when signing survey plans. During the past year 56 members obtained their stamps. May I point out that these stamps are available only through the Secretary-Treasurer by paying the amount of \$3.50 in advance.

As in the past, we have received a number of complaints; some from the public against some of our members and some from members against other members. As usual these have been dealt with by the Discipline Committee and your executive. In order that we may function better in the future with regard to complaints, I ask that you support the changes to the By-Laws which prescribes for the formation of a Complaints Committee.

In February I attended the 62nd Annual Meeting of the Canadian

Institute of Surveying as one of your delegates. I thank you for the opportunity of attending this Convention and I trust that you read my report on it which was published in the April issue of the Nova Scotian Surveyor.

While in the vicinity of Toronto during the month of March, I took the opportunity to call on Mr. A. F. Allman, Secretary-Treasurer of the Ontario Land Surveyors Association. I was well received at the office by Mr. Allman and his staff, and they went out of their way to show me their set-up and what the daily routine is like in a full-time Association office. I would like to publicly thank you, Mr. Simpson, for the hospitality shown me by your staff in Toronto.

During the year I attended a regional meeting in New Glasgow (Eastern Area) and in Sydney (Cape Breton Area). Both of these meetings were highly successful and I wish to thank the members of these areas for the hospitality shown me. Unfortunately, I was away when the regional meeting was held in Halifax and therefore unable to attend. As a result of my visits to these areas, I am convinced that these meetings must continue so that our Association may grow stronger and also that those who are unable to attend the Annual Meeting may have the opportunity to express their opinions at the regional meeting.

In concluding my report, I would like to say that should any of you have inquiries or suggestions regarding the Association, please feel free to approach me. Thank you, gentlemen.

Respectfully submitted,

Edward P. Rice,
Secretary-Treasurer.

Association of Nova Scotia Land Surveyors

Scale of Minimum Fees

Schedule "A"

Fees under this schedule shall be the payroll costs of personnel during the time they are working on the survey or project multiplied by a factor of not less than 2.0, plus incurred expenses. Payroll costs shall include all fringe benefits such as unemployment insurance, pension plan contributions and vacation pay.

Schedule "B"

Fees under this schedule shall be calculated in accordance with the following minimum rates plus incurred expenses.

Principals and Senior Surveyors	\$10.00 per hr.
Junior Surveyors	8.00 per hr.
Senior Instrumentmen	7.00 per hr.
Junior Instrumentmen	5.00 per hr.
Senior Draftsmen	7.00 per hr.
Junior Draftsmen	5.00 per hr.
Chainmen	4.00 per hr.
Rodmen	3.50 per hr.
Casual Labour	3.00 per hr.

Clerical Staff on reports and other documents applicable to the survey or project. 5.00 per hr.

In both schedules "A" and "B", charges shall be made for the full time personnel are working on the survey or project and shall include travelling time between the surveyor's office and the site.

Incurred expenses shall be those expenses incurred specifically for the survey or project, independent of the normal operating expense covered by regular wages and overhead. Without limiting the generality of the foregoing, these shall include:

- (1) travelling expenses
- (2) communication expenses (telegrams, long distance telephone calls, etc.)
- (3) reproduction costs for plans
- (4) outside professional or technical services
- (5) mileage
- (6) iron bars, stakes
- (7) registry office fees

Incurred expenses shall be reimbursed by the Client at actual invoice cost plus a minimum of fifteen (15) per cent to cover bookkeeping, interest on investment and other handling time.

Schedule "C"

For surveys of commercial, industrial or high class residential properties, hourly rates plus one-tenth of one per cent of the assessed value of the land and building and not to exceed two hundred per cent of the calculated fee based on the preceding schedules.

Recommended by Council September 1969

DELEGATE'S REPORT OF THE 2ND ANNUAL MEETING OF
THE ASSOCIATION OF PRINCE EDWARD ISLAND LAND
SURVEYORS

On April 25, 1970, I had the opportunity to represent our Association at the 2nd Annual Meeting of the Association of Prince Edward Island Land Surveyors held at the Kirkwood Motel in Charlottetown.

The Meeting lasted for one day beginning in the morning at 9:15 A. M., with registration. The business sessions began at 9:30 A. M., with the President's report and the introduction of visitors.

After the first business session, a paper was presented by Mr. Neil Flemming, Director of Surveys, on the Control Surveys for Prince Edward Island.

During the afternoon, two papers were given, the first, by Mr. Stan Bishop, Director of Planning for Prince Edward Island, who spoke on the "Relation Between the Surveyor and Planner"; the second, by Mr. R. O. Semper, from the Legal Surveys section of the Department of Energy, Mines and Resources in Ottawa. Mr. Semper spoke on the work being done by Legal Surveys in Canada, relating to Indian Reserves and National Parks.

During the final business session, Mr. W. C. Phillips became the second president of the Association succeeding Mr. Carl MacDonald. It was duly passed that the Board of Examiners of Prince Edward Island meet with those of New Brunswick and Nova Scotia with the view of standardizing the examinations and educational requirements in the Maritime Provinces.

A reception and banquet was held in the evening with thirty-five in attendance including exhibitors and guests.

The executive of the Association of Prince Edward Island Land Surveyors are to be congratulated for conducting such an excellent meeting.

Respectfully Submitted,

E. P. Rice,
Secretary-Treasurer

APPLICATION OF COORDINATE CONTROL TO LEGAL SURVEYS IN ONTARIO

by

S. B. Panting
Acting Surveyor-General of Ontario
Toronto, Ontario
Canada

In the preparation of legislation permitting or making mandatory that legal or cadastral surveys be connected to control, the question arises as to how it can be effected without incurring substantial cost and without disruptive consequences.

A province the size of Ontario with such diversity of development cannot be subjected to an arbitrary decision that all cadastral surveys effective at a particular point in time be connected to control. The cost of providing adequate primary, secondary and tertiary control under these circumstances would be out of the question. In addition, the time required to provide adequate density of control using conventional methods precludes the work being completed in the foreseeable future.

The obvious answer is that found by other provinces-- the imposition of coordinate control areas on parts of the province having a sufficient density of control to permit economical intergration. The enlargement of coordinate control areas as additional control permits would enable merging of individual coordinate control areas to eventually cover all areas of high cadastral survey activity in the province. Such a concept can be considered reasonable and attainable, and it is desirable from an economic standpoint. The public cannot expect to endure forever the cost of resurveys which have continued in one form or another since the original survey of townships in the province. Salvation undoubtedly is the indestructible coordinate which will not decay and become obliterated or lost.

A coordinate control area within the context used here means an area whose boundaries are defined on a plan of survey, and within which exists a series of control monuments interrelated in the coordinate system applicable. A coordinate system is a system containing all elements permitting precise mathematical relationship of points on the earth's surface by use of rectangular coordinates. Hence, through adoption of a system of coordinate surveys, its application with full recognition of its limitations, and the interrelationship of accurately connected monuments within a defined coordinate control area, all cadastral surveys can be connected and coordinated and provide the indestructible relationship we seek.

The methods adopted in connecting cadastral surveys to coordinate control bears careful consideration. For example, the class of control monument to which a survey can be connected should be other than the highest order in any class established for the purpose of identifying ranking according to accuracy. The obvious reason is that adjustment of error in primary control may often indicate misclosure when connections are made to tertiary control by conventional standards employed in legal surveys. I am not so sure at the moment that permitting connection between tertiary and secondary control through a

cadastral survey will not provide some headaches; however, I do not believe there should be a prohibition by legislation.

In carrying out a cadastral survey in Ontario, there are certain standards imposed on the conduct of the survey or in the preparation of a plan or both by existing legislation. The Surveys Act, Registry Act, Land Titles Act, Mining Act, Certification of Titles Act and Condominium Act may be cited as examples. Requirements under this legislation, I am confident, will remain unchanged except for perhaps minor modification in some respect to accommodate coordinates and related information. The major change, however, will be in the manner in which connection to control is effected.

There are some in the profession who view the product of electronic distance measuring equipment as something which must be peddled to the public. Accurate distance measurement will, no doubt, cure many ills, but a proposal to provide a client with a cadastral survey which closes on itself with an accuracy of, say, 1:50,000 at excessive cost cannot be justified if such accuracy is not a prerequisite, and 1:5000 would have done equally well. The argument is put forth that it is logical to provide high accuracy because the work will easily close within the limits of accuracy required of legal surveys, because those distances can be relied upon in connecting future work, because in the event of destruction of monumentation, accurate distances will permit accurate re-establishment, and so on..., but let's not deceive ourselves in believing all surveys should be executed with a high degree of accuracy.

Don't let us overlook the fact that as such work is extended and connected to other surveys which close on themselves with a high order of accuracy, there will most certainly be discrepancies and disagreements as there is currently with low order cadastral surveys. Some surveyors will not be easily convinced that such a situation can and will exist.

How, then, will the challenge or requirement be met to provide a control network for cadastral surveys. In my opinion, until such time as there is a breakthrough in current methods of providing control, such as photogrammetric methods of densification or a sophisticated airborne control system, second and third order control must be established by consulting surveyors acting under specific instruction. The obvious advantage in such a proposal is that control can be established where and when required to a specification which will ultimately permit integration into the Ontario Coordinate System. It should be noted the very important assumption here is that primary control is, in fact, available for breakdown.

During the interval between establishment of control by consulting surveyors and designation as coordinate control in the system, hopefully preliminary coordinate values could be published and monumentation designated as, say, subsidiary control. Such a designation would merely be as a warning to the user that the monument does not enjoy the same status as a coordinate control monument, and that it can only be used under conditions established by regulation pending its upgrading.

As I mentioned earlier, the designation by regulation of areas as coordinate control areas is viewed as the most suitable means of integrating the cadastral system and the coordinate system. The user

will require easy access to the most up-to-date coordinate control data available within the coordinate control area. The local land registry office is, in my view, an excellent repository for such information, in addition to a central recording office. Accordingly, definition of a coordinate control area must be accompanied by a monument schedule containing zone or control meridian identification, monument identification numbers, grid coordinates in feet and meters, scale factor, azimuth to other visible monuments, azimuth marks if any, geographic coordinates, elevation of the station in feet and meters, together with a description of the type and location of each control monument appearing on the plan. This is the essential information required by a surveyor about to undertake a cadastral survey in a coordinate control area.

Now let us look at the manner in which actual connection of a cadastral survey to coordinate control could be effected. The conventional methods are, of course, closed traverse, triangulation, trilateration and resection.

In connecting by traverse, the survey would of necessity derive azimuth control by opening and closing on pairs of control monuments and include at least two separate monuments of the cadastral survey. Relative error would be secured by comparison of measured bearings and distance computed between control monuments. Limits of error in closure need only be compatible with conventional requirements.

Connection by triangulation should require that at least one monument of the cadastral survey be used with azimuth control secured from coordinate control. A limitation on the length of the sides and size of angle at the triangulated monument must be imposed to ensure excessive error is not incorporated into the triangle.

Trilateration and resection should also require use of at least one monument of the cadastral survey with azimuth control secured from coordinate monuments. Here again, limitation must be placed on the length of trilateration or resection rays, minimum size of angle at the trilaterated or resected monument, relative error of a trilateration distance and maximum error in a resection angle.

In the survey of large tracts of land, the most reasonable method of connection to control appears to be independent connection of cadastral monuments to control by traverse, triangulation, trilateration or resection. In city surveys, however, checked offsets from direct connection between control will likely be the most acceptable method in light of the probable high density of control.

Whether such requirements will prove workable in practice in Ontario will have to be left to the future. It will be recognized that some of my suggestions appear as elements of legislation, regulation and the instruction from other provinces and the Federal Government. Perhaps Ontario could take consolation in knowing that if such a proposal is adopted and subsequently fails, there will be more than one shoulder to cry on.

Paper delivered at
The Sixty-Second Annual Meeting
The Canadian Institute of Surveying
February 5, 6 and 7, 1969

COMPILATION AND PUBLICATION OF HORIZONTAL CONTROL
DATA FOR PUBLIC USE

by
D. C. Holmberg
Assistant Director of Surveys
Department of Highways
Alberta

We, in Alberta have been involved in control surveys in the major centres since 1962.

The Surveys and Mapping Branch of the Department of Energy, Mines and Resources established first order control at 5 to 15 mile intervals and second order control at 1 to 2 mile intervals. This basic control was established in Calgary, Edmonton, Lethbridge, Medicine Hat, Red Deer and Grande Prairie.

Third order control has or is being established at approximately 1,000 foot intervals by the Province and the Municipality concerned. In this respect the municipal authority carries out monumentation subject to the approval of the Director of Surveys as to size and shape of the figure.

Each year funds are appropriated by the Province for the survey of areas which are deemed by the municipal authority to be the priority areas. The majority of the field work is carried out by surveyors in private practice working under instructions from the Director of Surveys. All linear measurements are made using electronic equipment and angular measurements are made with 1 second Theodolites using high standard sighting devices.

We have at our disposal an IBM 360 model 65 computer and we use a key-punch machine in our office. All computations and adjustments to third order control surveys are carried out in the office of the Director of Surveys.

When a new monument is created and all necessary information is available a card is prepared, which is in effect a "BIRTH CERTIFICATE". This card contains every bit of information we know about that particular monument. All monuments that fall within a given map sheet area are listed on this birth certificate of "I.D.CARD". A typical card would show monument number, latitude, longitude, 3TM co-ordinates in feet and meters, elevation in feet and meters(if known), projection, reference meridian, scale factor, map sheet number and order of monument. We have also made provision to show the grid bearing and ground distance to adjacent control monuments. The card will also show U.T.M. co-ordinates for the monument if need arises.

The key-punch cards that are generated in the process of compiling the field data are retained for amendments, up-dating and for obtaining computer "PRINT-OUT" of the co-ordinate listing for general use. By utilizing a multi-purpose program we obtain a listing for first, second and third order stations. These lists are dated and contain a complete picture of any given area. A typical print-out would start with the heading "LIST OF FIRST ORDER SURVEY CONTROL MONUMENTS DATED 07-10-68, MAP SHEET 937 + 36.". The listing would show monument number, survey date, latitude, longitude,

northing in feet and meters, easting in feet and meters, elevation in feet and meters and scale conversion factors. The list would end with the statement "END OF LIST OF FIRST ORDER SURVEY CONTROL MONUMENTS DATED 07-10-68". A similar process is used for second and third order print-out.

If a monument is destroyed the corresponding I. D. card is so noted, but is retained for future reference. If a new monument is created, its card is inserted in the deck in the appropriate location.

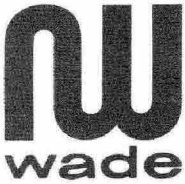
In addition to the print-out for the control stations, we must consider the co-ordinates of certain points in the land system. This of course, is necessary if we are to produce a "CADASTRAL MAP".

Co-ordinates are calculated for block corners and deflection points in the land system using a variety of data. To delve into this in detail would take considerable time, so I will quote only the heading statements of the computer print-out which should help to illustrate this phase. The print-out for first priority cadastral stations, would have the heading "3TM CO-ORDINATES DERIVED FROM VERIFIED TIES TO UNCONFIRMED EVIDENCE" and the third priority is "THEORETIC 3TM CO-ORDINATES DERIVED THROUGH CALCULATION".

We now have compiled sufficient information to prepare a cadastral map. We have defined a cadastral map as a map which shows the relationship between land boundaries and survey control monuments. For mapping and identification purposes the Province is divided into "MAP SHEET AREAS". These consist of areas 3,000 meters north and south by 4,000 meters east and west. The projection used is the 3° Transverse Mercator. The number of the map sheet is the co-ordinate at the south-east corner of the map sheet. For example: map sheet 937 + 36 covers an area between 5,937,000 meters N and 5,940,000 meters N and 32,000 meters E and 36,000 E of the central meridian. Maps of these areas are drawn on a scale of 1:5000. The 1:5000 areas are further divided into 25 cadastral sheets covering 600 meters north and south by 800 meters east and west and are drawn on a scale of 1:1000. The 1:1000 sheets have the same identification number as the 1:5000 sheets with the addition of the 1:1000 sheet number. For example: the numbering of the 25 sheets is similar to the numbering of the legal subdivisions of a section. Therefore, the number of the cadastral sheet in the south-east corner of the 1:5000 map sheet would be 937 + 36 · 1.

The 1:1000 cadastral sheet shows the current situation with respect to all legal survey plans within a given area. No attempt is made to show any other feature. We feel the user will find many ways to use this information. The birth certificate or I. D. card, computer print-out and cadastral sheet form a complete package for anyone wishing to study, develop or re-develop any area. We envision, in time, the accelerated use of our system by city engineers, town planners, statisticians and of course, land surveyors who will probably be one of the smaller user groups.

Paper delivered at
The Sixty-Second Annual Meeting
The Canadian Institute of Surveying
February 5, 6, and 7, 1969
Ottawa, Canada



INFORMATION

DRAFTING, DESIGN, REPRODUCTION, SURVEYING, TECHNICAL SCHOOL MATERIALS & EQUIPMENT; LETRASET & ACS TAPES; WADE DI-LINE & DI-LAR, TRANSTEX & TRANSLAR PAPERS & FILMS; DRAWING TABLES.

ANNOUNCING THE APRIL 1st
OPENING OF OUR NEW REPRODUCTION FACILITIES & SERVICES,
LOCATED HERE IN OUR FIRST FLOOR, TRADE MART PREMISES.



- ★ DIAZO WHITEPRINT REPRODUCTIONS
- ★ SEPIA INTERMEDIATE REPRODUCTIONS
- ★ DILAR FILM REPRODUCTIONS
- ★ CONTACT PHOTOGRAPHIC REPRODUCTIONS
- ★ PROJECTION PHOTOGRAPHIC REPRODUCTIONS
- ★ RESTORATION OF ORIGINAL TRACINGS
- ★ MICROFILM BLOW-BACKS



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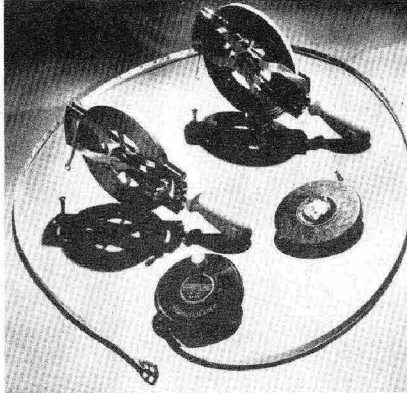
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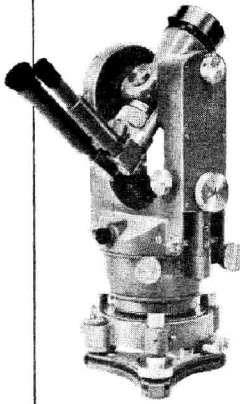
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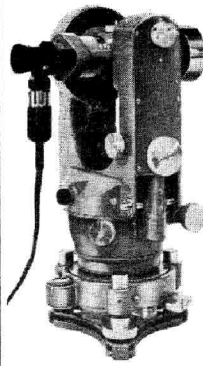
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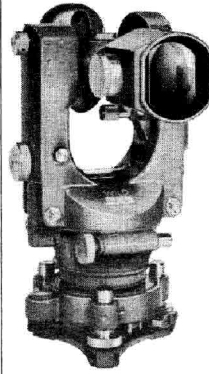
Wild T1-A Double Centre Theodolite with mounted Diagonal Eyepieces



Wild T1-A Double Centre Theodolite with the Wild GOA Autocollimation Eyepiece



Wild T1-A Double Centre Theodolite with the Wild GPM2 Parallel Plate Micrometer



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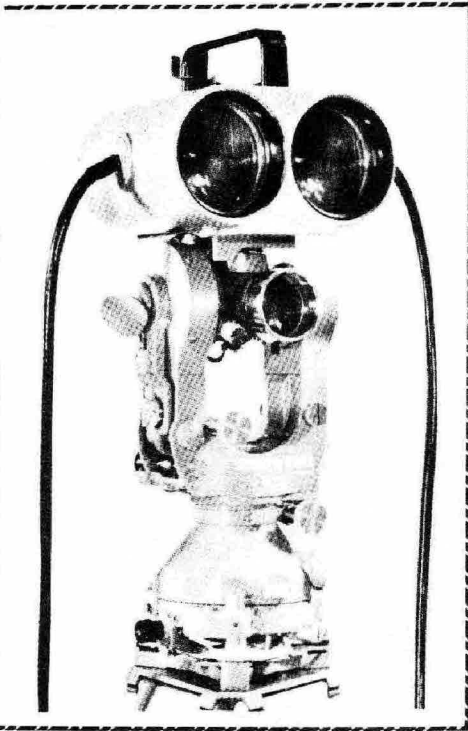


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■ Applications

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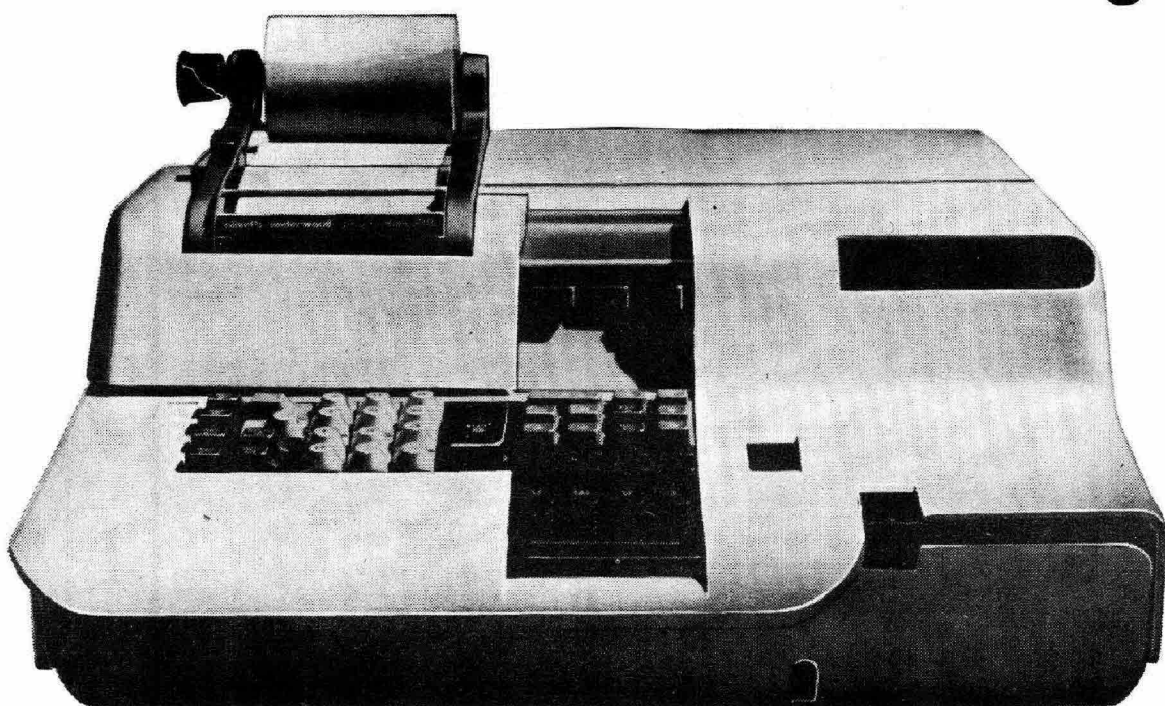
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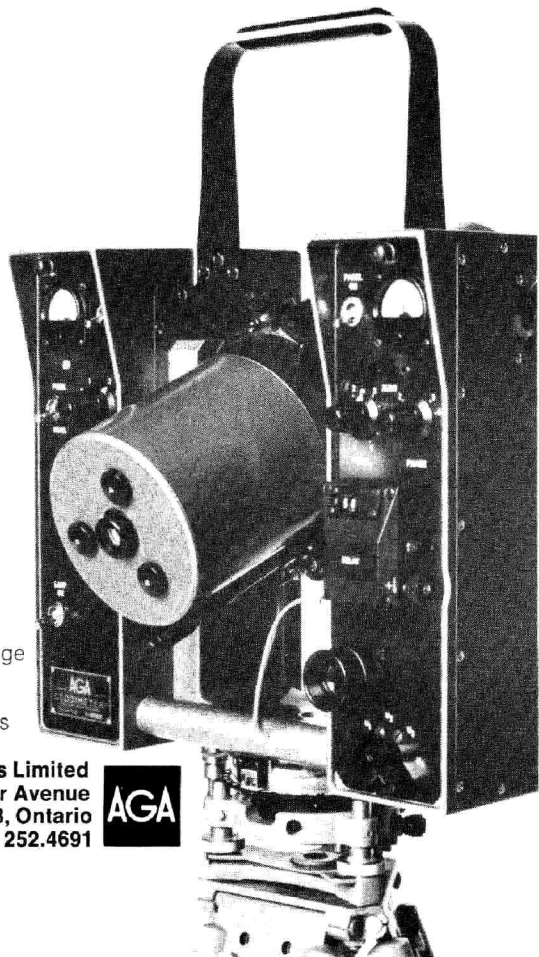
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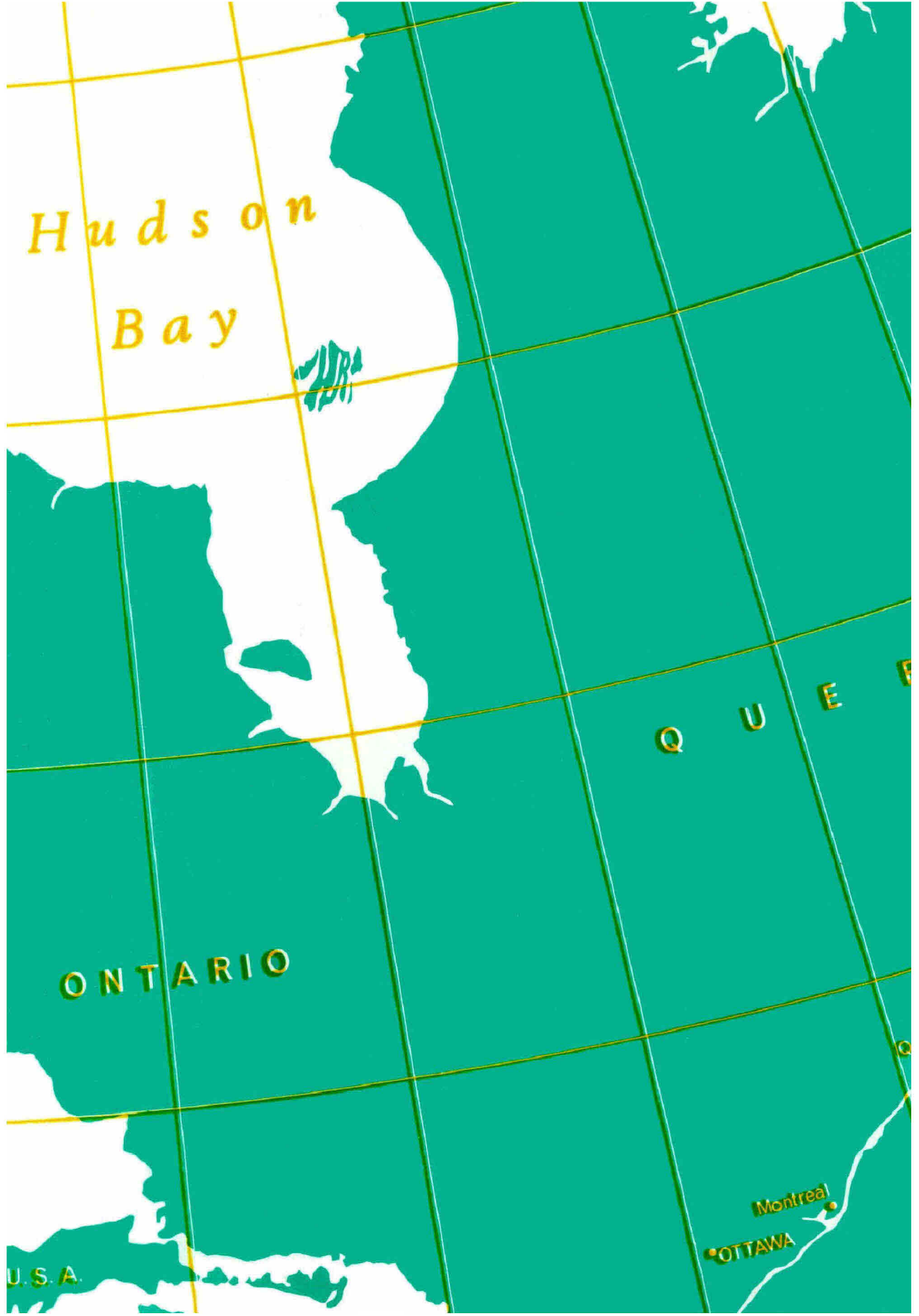
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