
The NOVA SCOTIAN SURVEYOR
LABRADOR
NEWFOUNDLAND
St. John's
PRINCE EDWARD ISLAND
Charlottetown
NEW BRUNSWICK
Fredericton
NOVA SCOTIA
Halifax
Atlantic Ocean
52°
48°
44°
40°
68°
64°
60°

The NOVA SCOTIAN SURVEYOR

Published four times a year by
THE ASSOCIATION OF NOVA SCOTIA LAND SURVEYORS INCORPORATED

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Founded 1951 Incorporated 1955

Vol. 20 June 1968 Number 56

$923,000 ADB GRANT FOR NOVA SCOTIA DEED SEARCHING

LAND REGISTRY SYSTEM TD BE MODERNIZED

The computer age of modern methods of mapping and registration of land is moving in on the Atlantic provinces. These provinces have been held back by their archaic form of land surveys and cumbersome method of title searching and deed registry. Now this is going to be radically changed.

OTTAWA (Copyright) — Atlantic Development Board grants of nearly $4,000,000 to assist the Atlantic provinces with a surveying, mapping and land registration program were announced by Health and Welfare Minister Allan J. MacEachen, minister responsible for ADB.

The grants — $1,446,000 to New Brunswick, $923,000 to Nova Scotia, $1,003,000 to Prince Edward Island, and $600,000 to Newfoundland — cover the years 1968-69 and 1969-70. The complete program will extend over 10 to 25 years at an estimated cost of up to $20,000,000. Mr. MacEachen noted that assistance beyond the initial two-year period would be considered on a cost-sharing basis with the provinces.

The size of the ADB grants, he stressed, reflected "the technical and administrative capacity of the provinces to absorb federal assistance over the next two years, not the importance or the overall cost of the program in any one province."

The minister said there was a pressing need for the program if the economic development of the Atlantic region was to proceed in a sound and planned way.

Because of early haphazard and unplanned allocations of land, lack of fixed co-ordinates upon which to base land descriptions and maps, and a land title system that permits overlaps and gaps, Mr. MacEachen said land records were incomplete and totally inadequate for the needs of a modern, expanding economy.

NOT INTEGRATED

Mr. MacEachen explained that at present the large-scale mapping required for city and regional planning, highway and power developments, mineral and forest exploitation, was being done from different co-ordinates and cannot be integrated to provide multiple use and uniform coverage.

Not infrequently, he added, community and industrial developments have been postponed or even dropped completely because of difficulty in establishing ownership and securing clear titles.

Replacing the costly and inefficient system of title searching and deed registration will be the Torrens system, in use in the United Kingdom, United States, Ontario and the western provinces. Its principle is that land is permanently registered, permitting

the registrar of titles to provide quickly and accurately the material facts of ownership and boundaries.

An integral part of the new system will be one or more data banks for the storing of a wealth of information through use of computers. In addition to information on land titles, the banks will record and store data on engineering services, such as the routes of highways, sewers, water and power lines, related to specific land markers. Detail of this type and the ability to relate it graphically was considered essential in any form of comprehensive land use planning.

Mr. MacEachen pointed out that before the Torrens system and data banks can be established, a great amount of preliminary surveying and mapping will be necessary. The first phase of the program will involve development of a co-ordinated system of land control, proceeding from large-scale geodetic surveys by the Department of Energy, Mines and Resources to smaller-scale surveying from permanent markers or monuments. Through the use of aerial photography related to the land markers, large-scale mapping will follow.

The minister noted that the immediate needs of Prince Edward Island were greater than those of the other three provinces because of the imminent presentation of a comprehensive economic development plan under the Fund for Rural Economic Development (FRED) program. Success of this plan depends to a considerable extent on rapid progress being made with the surveying, mapping and land registration program.

In New Brunswick, where the program already is well advanced through the province's own resources, priority is being given to the requirements of the FRED program in the northeastern and Mactaquac areas.

The program is being administered by a federal-provincial committee consisting of representatives of the four provinces, Atlantic Development Board, National Research Council and the Department of Energy, Mines and Resources. Close co-ordination will be maintained with ARDA and the Canada Land Inventory.

RECORD GRADUATION AT LAND SURVEY INSTITUTE

LAWRENCETOWN — Fifty-five students were graduated at the closing exercises of the Nova Scotia Land Survey Institute held in the assembly hall of Lawrencetown Consolidated School. The graduates, the largest number in the history of the institute, included: cartographic drafting 10; photogrammetry, 7; second-year survey, 13; first year survey 25.

J. F. Doig, who succeeded George E. Streb on April 1, as principal, (Mr. Streb having been appointed supervisor of technical education for the Nova Scotia government) stated that all the graduating students had jobs and that "the proportion heading towards permanent employment in the Maritimes is higher than it has been for several years."

"For next year we already have a large number of applications," said Mr. Doig, "and I believe all of our courses are likely to be filled."

Guest speaker was Dr. G. W. I. Creighton, deputy minister, department of lands and forests.

Diplomas and certificates were presented by Everett A. Green, supervisor of provincial vocational schools, division of vocational education.

Principal Doig paid tribute to the memory of Major J. A. H. Church, who for 14 years was the chief instructor and was the first principal of the Institute. He died last June.

Tribute was also paid to Col. George Streb who served five years as principal, to supervisor Green, to the institute staff and to the "fine spirit of co-operation between the local people and the student body."

During the graduation exercises there was a program of music by the pupils of the

Lawrencetown school under the direction of Miss Ethel Shaffner. At the conclusion of the graduation, tea was served by the ladies auxiliary of Lawrencetown branch of the Royal Canadian Legion.

NOVA SCOTIA LAND SURVEY INSTITUTE
LAND SURVEY — SECOND YEAR
1967 - 1968

Hugh Daniel Baille — Box 500, Victoria St., Westville, Pictou Co., N. S.
Boyd Welwood Battist — R.R. No. 2, Pictou, Pictou Co., N. S.
William Douglas Blenhorn — R.R. No. 1, Maccan, Cumberland Co., N. S.
Gary Douglas Bean — Apohaqui, R.R. No. 2, Kings Co., N. B.
Harold Earle Burton — R.R. No. 2, Shubenacadie, Hants Co., N. S.
Brian Jay Cameron — Bridgeville, Pictou Co., N. S.
Reuben Charles Deubry — Greenbay, Antigua, West Indies
Thomas Gray Gillis — 185 Main St., Middleton, N. S.
Charles Lorne Higgins — R.R. No. 5, Middle Musquodoboit, Halifax Co., N. S.
Gerald Lester Mehlman — Port Mouton, Queens Co., N. S.
Julian Grafton Phillips — 176 Stirling Pl., Apt. 2E, Brooklyn 11217, N.Y., U.S.
Donald Arthur Read — 5 Herring Cove Rd., Armdale, Halifax Co., N. S.
Paul Clifford Stone — 92 Woodland Ave., Dartmouth, N. S.

LAND SURVEY CLASS — 1A
1967 - 1968

Deborah Evelyn Balcom — 189 Main Street, Middleton, N. S.
John Phillip Craig — Rothesay, R.R. No. 1, Kings County, New Brunswick
Terrance Randolph Doogue — Hantsport, Hants County, N. S.
James Gary Glenn — St. Andrew's, Antigonish County, N. S.
James William Perry Grant — Meagher's Grant, Halifax County, N. S.
Mervin Wayne Hartlen — Box 277, Milton, Queens County, N. S.
Frederick William Hingley — Box 25, Debert, Colchester County, N. S.
Frederick Calvin Hutchinson — 21 Pauline Crescent, Dartmouth, N. S.
Helen Christene MacPhail — Marble Mountain, Inverness County, N. S.
George Robert Sellers — 96 Faulkland St., Pictou, Nova Scotia
Cuthbert Paul Seely — Havelock, New Brunswick.
Garnet Everett Wentzell — R.R. No. 5, Bridgewater, Lunenburg County, N. S.

CARTOGRAPHIC DRAFTING
1967 — 1968

Kenneth Allan Arsenault — 111 Milton Ave., Summerside, Prince Co., P.E.I.
Grant Louis Carson — 19 Gower Street, Charlottetown, P.E.I.
Andrew Willett MacNutt Forbes — Old Barns, Colchester Co., N. S.
Thomas Ervin McAloney — River Hebert, Cumberland Co., N. S.
Donald Stirling Rodd — 91 Highland Ave., Charlottetown, P.E.I.
Fred Stuart Sanford — Kingston, Kings Co., N. S.
Diana Rose Slauenwhite — Lawrencetown, Anna. Co., N. S.
George Lawrence Smith — R.R. No. 4, Bridgewater, Lunenburg Co., N. S.
Eric Sutherland Willis — 165 North River Road, Charlottetown, P.E.I.

PHOTOGRAMMETRY
1967 — 1968

Michael Earl Chute — 19 MacDonald Park Road, Kentville, N. S.
Peter James Dickie — Digby, Nova Scotia
Arnold David Fralick — R.R. No. 1, Pleasantville, Lunenburg Co., N. S.
Phillip Edward Gaul — R.R. No. 1, Lawrencetown, Anna. Co., N. S.
Graham Clair Goodwin — R.R. N. 4, Bridgetown, Anna. Co., N. S.
Kenneth Allen Sharples — Stewiacke, Colchester Co., N. S.
Howard Bruce Whidden — 179 Main Street, Wolfville, N. S.

NOTES FROM THE SECRETARY'S DESK

By E. P. Rice, Secretary - Treasurer

On July 1, 1968, all persons holding licenses to practice as "Provincial Land Surveyors" will now be know as **"Nova Scotia Land Surveyors"**. Plans and other survey documents must be signed using the new name or letters **N.S.L.S.**

The Act which was given Royal assent on March 19 this year and changes the word Provincial to Nova Scotia will be published at a later date.

On June 29, 1968, a special feature on land surveying was run in the Halifax Herald and Mail. I wish to thank all those who took ads in this special issue and thus helped to promote surveying in Nova Scotia.

This is the first time that such publicity was given surveying in Nova Scotia and I hope that our next feature will be even larger and better.

Plans are now being made for the 18th Annual Meeting to be held on November 1 and 2, 1968 at the Citadel Inn. It appears to be shaping up to another very interesting meeting, so plan now to attend.

For the past month, Mr. H. B. Robertson, Director of Surveyors for the Department of Lands and Forests and a Past President of this Association has been sick and is presently confined to the Victoria General Hospital in Halifax. We wish Mr. Robertson a speedy recovery.

Mr. Rusty March has just completed a trip across Canada and return with his wife. Mr. March informed me that during his trip he spoke to many members of the C.I.S. who are looking forward to coming to Nova Scotia in 1970 to attend the C.I.S. Annual Meeting.

Mr. Otto Rosinski, a former councillor of the Association from Port Hawkesbury has returned to Nova Scotia and taken up residence in New Glasgow. For the past several years he has worked in various cities in Canada and the United States.

I would ask anyone with items of interest for this column to please send them to me. I would also appreciate any comments.

AUTOMATION IN SURVEYING

J. W. L. Monaghan
Chief Surveyor
Marshall, Macklin and Monaghan
Don Mills, Ont.
EIC-65-VIC 11

Automation is coming to surveying through electronics.

The application of electronics to surveying is not a new proposition. During the past 15 years a number of applications have been developed and refined to the point where the surveyor in private practice now is able to take advantage of them. For instance, by 1950 a device to measure distances electronically by means of modulated reflected light waves had been designed by Dr. Eric Bergstrand of the Georgraphical Department of the Government of Sweden. This device is produced and sold under the trade name Geodimeter by Aga Corporation of Sweden. The original models were developed for precise base line measurement and for other geodetic purposes.

The accuracy of the first two models was stated to be within 1 cm. plus one millionth of the distance with a range of about 45 km. (30 miles). A third model was soon introduced for work that was less demanding in accuracy but which required greater portability. The range of this instrument was 20 miles with an accuracy of 5 cm + — two millionths of the distance.

The fourth model of the geodimeter, now in production, has an effective range of up to one mile with an accuracy within 1 cm. + — five millionth of the distance under average daylight conditions. Set up and measuring time has been reduced to about 15 minutes. The machine operates from a gasoline engine generator or a battery and converter. Since the reflectors erected at the remote stations need not be attended, it is a very economical system to operate and well adapted to survey by measurement of polar coordinates.

The Decca system, originally designed for hydrographic position plotting, now has been developed for direct measurement of distances. Because it operates with low frequency wave signals, it has a much greater range than other comparable devices. It is not limited to line of sight observations, and measurements of more than 200 miles have been completed. This system has proven its value in the navigation of hydrographic survey ships while on sounding runs, since a continuous position plot can be developed.

Shoran

The use of reflected radio waves in radar during the Second World War evolved into shoran (short range radio aid to navigation) and loran (long range radio aid to navigation). In the late 1940's and early 1950's shoran was used extensively in Canada to propagate geodetic control across the northern part of Canada and to effect a connection with the European system in Greenland. Ground stations were established up to 300 miles apart and by means of equipment installed in an aircraft making repeated passes between the two ground stations, radio waves were reflected from the two ground stations back to the aircraft. The time lag in the reflection of these waves was measured and from this and a knowledge of the aircraft's height, the distance between the ground stations was derived. Triangulation stations were established in this matter throughout northern Canada. Simultaneous adjustment of this complex was made on a Remington Rand Univac. The accuracies yielded were in the order of one part of 60,000, and the time saved was immeasurable.

There were also important political overtones in this rush northward. There were some indications that Canada must take a more active interest in the Arctic islands or risk a challenge to undisputed ownership over this area.

The extension of control into the Arctic archipelago enabled the Federal Govern

ment to complete in 10 years the detailed mapping of these regions, which was perhaps an important factor in maintaining Canada's sovereignty over these areas.

Evolution of Radar

There are now a number of evolutions of the wartime radar such as the "Electrotape" by Cubic Corporation, an American group, or the "Distomat" by Wild of Switzerland. To date however, the most highly developed equipment in this line is the South African tellurometer.

The tellurometer was invented by Dr. T. L. Wadley of the Telecommunications Research Laboratory of the Council for Scientific and Industrial Research of South Africa. In the simplest terms, this equipment emits a modulated microwave which is received by the second set and returned. The difference in phase between the transmitted and received signal is a measure of the distance between the two sets.

The tellurometer was instantly acclaimed throughout the world as one of the greatest advances in surveying. Some indication of its impact may be derived from the fact that the Russians claim to have first thought of the principle in 1943. The equipment is light in weight and reasonably portable. It yields accuracies of a geodetic order, is simple to operate and easy to maintain. The original models, Mark I and II, operated on a carrier frequency of 3000 megacycles per second with a pattern frequency of 10, 9.999, 9.9 and 9.0 megacycles per second. A more recent development, the MRA3 Tellurometer is transistorized, with a self contained power pack and operates on a carrier frequency of 10,000 m.c./s. This higher frequency for the carrier waves improves the efficiency of the machine by reducing stray reflections which cause erratic readings known popularly as "ground swing".

The Hydrodist and the Aerodist

The Hydrodist is a lower accuracy instrument with instantaneous read-out to one meter. It is essentially a modified MRA2 and is very similar in appearance. The cathode ray tube display has been modified and automatic switching of the remote instrument is done by the master operator. Aside from its use in hydrographic surveys for rapid fixes, it has a valuable application in reconnaissance surveying.

The Aerodist is a somewhat more complicated mechanism used in aerial triangulation in a similar manner to the earlier shoran. This device may be fitted with a recording graph which automatically records the distances measured.

A current application of the Hydrodist is the determination of approximate distances to sight obstructions from forest fire towers. In this case a master station will be established in the fire tower and a helicopter bearing the remote instrument will be directed to the obstruction. The master operator can obtain the distance to the remote station to the nearest 100 meters by reading the cathode ray tube display on only two frequencies. The automatic switching feature of the remote instrument means that it need only be strapped in the helicopter, turned on, and left unattended during the measuring sequence.

Similar local applications can be imagined for determining distances to relatively inacessible points such as hydro-electric tower locations, or across rivers or lakes. Where greater accuracy is required, a cursor is provided on the cathode ray tube which may be read to one meter. For more precise work the U.S. Geological survey has developed what they refer to as "Air Borne Control Survey System".

Airborne Control

The purpose of this system is to establish survey control points in relatively inaccessible areas at a fraction of the ground survey costs. This system consists of helicopter modified to enhance its hovering ability, the Hydrodist, a Hoversight, and a height indicator. The Hoversight consists of a light source in a pendulum which projects a pin-point beam of light through a series of mirrors onto an image of the terrain beneath the helicopter.

The control point is marked on the ground by a paint bomb to provide a definite

hovering target. Once the pilot is in a hovering position over his target a weighted dacron line is lowered to the ground and the height of the helicopter is read off a calibrated dial. Meanwhile distance, angular and meteorological measurements are being taken at the conclusion of which the helicopter moves to the next point. In some areas this system has improved the efficiency of field work for mapping programs by a factor of eight.

One example often used to show the startling economy of the tellurometer system is the Ridgeway Baseline in England. When this line was first measured in 1951, it required a crew of 50 men a month and a half using Invar tapes and all the other paraphernalia essential to precise chaining. Two men with tellurometers measured this same distance in one half hour and their determination of the length varied from the accepted value by only 7 cm. or one part in 150,000. This is automation.

The experience of the British Columbia Department of Lands and Forests is significant in this respect. They report that in one season with nine men equipped with tellurometers, they can complete more than twice as much field mapping control as they did previously using 10 times the number of personnel.

Experience

The author's firm has used tellurometers for the past three years with considerable satisfaction. Although similar accuracies can be obtained with other electronic systems such as the Electrotape or Geodimeter. Tellurometer was chosen because of its wide range of utility, its reliability and availability. It functions equally well in most kinds of weather, in daylight and darkness. A very significant feature is the built-in duplex radio system. During 1961, it enabled the completion of the distance measurements for a traverse along a 40 mile proposed road in the Arctic in one and one half days. Chaining or triangulating these distances would have taken at least three weeks and because helicopters were the only method of transport, would have been tremendously expensive.

Similarly in 1962, in Northern Saskatchewan a 40-mile traverse of eight courses was measured in one day, a feat impossible to duplicate in a month by conventional methods. Further to the east a traverse was run from Cranberry Portage to Lynn Lake, Man., a distance of about 170 miles. Because the traverse had to be run along the railway right-of-way and for other reasons, the progress was not all that it might have been. However, along a route with more than 450 curves, a traverse that closed to within 4 ft. was completed in 41 days. This is an average of four miles per day in flat and difficult country. The tellurometer functions at its peak in rolling country where sights can be obtained between hill tops. Flat country not only restricts the length of sight possible but when compounded with an almost continuously curving track, reduces the efficiency of the instrument.

700 Mining Claim Survey

During the summer of 1963, the author's firm undertook a more ambitious task in contracting to survey more than 700 mining claims for Crest Exploration Limited, a subsidiary of the California Standard Company. These claims are located on the height of land between the Northwest Territories and the Yukon and about 260 miles north of Whitehorse. Present indications are that they encompass one of the largest iron ore bodies in the world.

Due to the rugged nature of the terrain, it was felt that conventional methods of claim surveying would not be feasible and that the possibility of using photogrammetry or electronic distance measuring equipment for claim corner position determination should be examined.

A great deal of the difficulty that was anticipated in this survey concerns the method of staking claims in the Yukon. Whereas in the Northwest Territories and in several of the provinces the prospector stakes each corner of his claim (known as four post staking) in the Yukon only two posts are planted on either end of the location

line. This is a theoretical line related by "call distances" on the prospectors' posts to the actual claim corners.

Another major difference in the system is in the disposition of extra land the prospector may have claimed beyond the statutory allowance.

In the four post system the claim may enclose more than the specified 51.65 acres provided the owner is willing to pay an extra assessment fee. In the Yukon there is no provision for oversize iron claims, consequently, the inevitable fractions that occur in this type of staking must be surveyed separately.

The essence of the survey would be to determine co-ordinates on all of the claim corners whether by ground or aerial methods. If photogrammetry were used, all points whose co-ordinates were to be determined would be flagged on the ground first, sufficient control would be established and then photographs would be flown at an average scale of 1 to 12000. At this scale with solid control, it was felt that no great difficulty would be experienced in establishing coordinates to the specified accuracy.

It soon became apparent however, that control would be required on all location posts to guarantee the accuracy of the remaining positions. This reduced the attractiveness of the photogrammetric proposition.

In addition, the time lag necessary between the completion of photography or ground control and the determination of the photogrammetric co-ordinates precluded the possibility of completing the project in one season.

It was finally decided to proceed with ground methods and to use Tellurometers as extensively as possible. The field surveyors were equipped with three MRA2 tellurometers, three Wild T2 transits and two Wild T1 transits, together with other more prosaic items and proceeded to the field on May 19.

Although considerable time had been spent in the office examining vertical photographs of the area the least that can be said is that the crews were dismayed when they reached the site and discovered just how rugged the country was. At that time of year the north slopes were snow covered except for slide areas. It was an awe inspiring sight to see the craggy peaks and precipitous slopes blending into U-shaped valleys.

The first task was to lay out basic control using tellurometers and theodelites. This was conducted in a leap-frogging operation, much as planned in the office. Although bad weather, including 6 in. of fresh snow intervened almost immediately, in a week about 40 control stations were established, and two loops were closed. Next all location posts were identified and tied in from the nearest control station. At the same time reference points were established near where the rear corners of the claims were expected to fall. Later these points were occupied and actual claim corner stakes were set out by angle and distance or by short traverses.

Relative Accuracy

Misclosures on the total of 145 miles of traverses in the Yukon ranged from one part in 41,000 to one part in 166,000 over three main traverses, and ten sub-traverses had closing errors of one part in 9000 to 16,000. All traverses were adjusted by the compass rule except for sub-traverses where the total misclosure was less than one foot. In these cases no adjustment was made. The closures on the sub-traverses would have been better if a reduction of the traverse distances to a mean level was carried out. This would not apply to such an extent to the main traverses since they were all on relatively high points but several of the sub-traverses ranged from elevations of 7000 ft. down to 2600 ft. and up again to a mountain station.

Considerable difficulty was experienced in reaching some of the locations since the owner had originally staked them by helicopter. The appropriate number of posts, usually four, were flown to the pre-determined site as pricked on the photograph. There they were either thrown or lowered to the chosen point, often on some nearly inaccessible ledge. The staker was then landed nearby and completed the staking ritual.

The staking was exemplary, the posts were cut to the proper dimensions from local

spruce and all pertinent data was inscribed in ink. Unfortunately for the surveyors, the location of the rear corners on favorable ground was a matter of chance and no discretion could be exercised as was the case with the staker and the location points. Consequently, it was often found that some of the rear corners were located on cliffs that could not be traversed or in rock slides or avalanche areas. These corners were marked by witness posts.

During the early part of the year there were many thunderous avalanches as the snow melted on the upper slopes. On July 19, at 3 p. m., many of us experienced our first earthquake and this caused considerable consternation and concern. A pronounced shaking was felt for several seconds and rock falls and snow slides followed.

Northwest Territories

In the latter part of July a smaller party moved to the Northwest Territories and completed the survey of 190 mineral claims in less than three weeks. A 41 mile traverse was run close to the perimeter of the claims and all corners on the primeter were tied in by tellurometer distances and angles. This traverse closed to one part in 57,000 with an angular misclosure of two seconds.

This survey would have been almost impossible to complete during one season by conventional methods. There would be more than 250 miles of traverse to run, much of it in the most rugged country imaginable. The fact that the job was completed in less than four months with only six technical people on the project full time is a credit not only to the modernization of surveying equipment but also to helicopter transportation.

Computations

Another field of surveying that has sparked some interest lately is computing. Surveyors in olden times used logarithms to solve their problems, to close traverses and to compute areas. The invention of desk calculators enabled the surveyor to use natural functions and further simplified a laborious task. The most recent models have many automatic features such as the derivation of square and cube roots, push-button multiplication and division and rapid print out. But desk calculators, whether operated by hand or by electricity, are mechanical aids only.

A program designed by I.B.M. for its 650 machine can be credited as the first successful application of electronic computing to secure a more rapid determination of surveying results. This program was available in 1954 and was a simple traverse closing program.

Improvement followed rapidly as other companies and individuals realized the implications of electronic computing of surveying data. More sophisticated programs were developed to keep pace with the complexity and speed of the computing machines.

Electronic computing has become an essential tool of surveying firms in recent years, due in part to an increased volume of work coupled with the elaborate cross-checks and detailed data demanded by the local municipal planning boards and other interested governmental authorities.

In the Township of North York for instance, a check is required on the area, the frontage and the lot width at the front building line. In addition, on lots whose side lines converge to the rear, a further check is required on the width at the rear building line. Their method for determining frontage is somewhat unique and follows this rather complicated ritual. The surveyor must join the mid-points of the front and rear of the lot with a straight line. A perpendicular line is then drawn through a point on the first or median line, a sufficient distance from the street line so that it will intersect the side lines at 25 ft. from the street line on one side and 25 ft. or more from the street line on the other side. The frontage is then measured along this perpendicular to the median.

Imagine the difficulty in staking a lot to agree with this principle without pre- computing it, or the time that would be consumed in resolving many such problems on desk calculators.

Urban Subdivisons

The mechanics of computing an urban subdivision may be of interest. The computer-technician must be supplied with a draft plan and an adjusted boundary survey of fixed lines to work from. In addition, a schedule of lot sizes, minimum or critical dimensions or other data that may influence lot size or shape. The input data is then prepared, punched on cards and taped. The preparation of the input data for a 70 lot subdivision of average complexity takes about 16 man hours and seldom exceeds two pages. Once the I.B.M. 7044 is loaded with the program, a 70 lot subdivision can be completely computed in less than two minutes.

A careful analysis of cost control records for more than 100 subdivisions, with a total complement of some 15,000 lots, shows that the average cost to the customer of manual calculations is about $5 per lot, including calculations for streets and larger, multi-sided blocks. This includes the cost for checking only those lots which appear by examination to be critical with respect to some zoning by-law requirement.

The corresponding costs for lot calculation, including streets, and blocks with an electronic computer, have varied from $3 to $4 per lot. In addition to the fact that much more complete information is obtained, a further advantage of electronic computing is that the printed results may be bound, and are therefore easily examined and checked against the final registered plan.

Automatic Plotting

The printed data may then be transcribed onto tracing paper or linen. With the advent of plotting machines which may be coupled to a computer such as the 7090 or the 7044, automatic plotting of the streets and lots will be offered to the surveyor. The plotter which is in use in the Toronto area was developed in California. It is essentially a ball point pen mounted on a track above a moveable roll plan. The pen plots straight lines in eight directions in increments of 1/200th of an inch, at the rate of 18,000 increments per minute. The quality of the plot leaves something to be desired as far as final survey plans are concerned, but represents a considerable advance on manual methods for preliminary plotting. The fact that all co-ordinated points are plotted to within 1/200th of an inch is of great value in the drafting of final plans.

At the time of writing, the program has been modified to provide for the checking of subdivision lots for conformity with zoning by-laws. With this modified input, rather than building succeeding lots on those previously designed, the machine considers each lot as a separate unit and checks it independently for closure, area, tangency of lines to curves, continuity of curves, frontage, and lot width at the building line.

Field work now may be expedited as well with the use of tellurometers or geodimeters to establish key control points throughout the area. However, since these machines cannot readily be used for laying out distances, inevitable recourse must be had to the transit and tape.

Other more exciting and even bizarre assists to surveying are on the horizon. Some of these, such as the United States Army's gyro-oriented north-seeking transit may be in common use within the next few years. The space age has imposed a considerable urgency on surveyors to modernize their techniques and equipment. It appears that distance measuring and computing devices have been receiving some attention along these lines. However, there has been little improvement in techniques or equipment for angular measurements in the last 40 years. Perhaps the next decade or two will see a similar revolution in this area.

BILL No. 18

HOUSE OF ASSEMBLY
NOVA SCOTIA
SESSION 1968

An Act to Amend Chapter 243 of the Revised Statutes, 1967, the Provcial Land Surveyors Act

1st Reading: 23 February, 1968

2nd Reading:

C.W.H.:

3rd Reading:

THE HONOURABLE
MR. HALIBURTON, KINGS SOUTH

No. 18 BILL 1968

An Act to Amend Chapter 243 of the Revised Statutes, 1967, the Provincial Land Surveyors Act

BE IT ENACTED by the Governor and Assembly as follows:

1 The title of Chapter 243 of the Revised Statutes, 1967, is changed from "Provincial Land Surveyors Act" to "Nova Scotia Land Surveyors Act".

2 Section 1 of said Chapter 243 is repealed and the following substituted therefor:

1 (1) In this Act,

(a) "Association" means the Association of Nova Scotia Land Surveyors constituted by this Act;

(b) "Board" means the Board of Examiners for Nova Scotia Land Surveyors constituted by this Act;

(c) "Council" means the Council of the Association;

(d) "instrument" means an instrument for measuring a line or angle;

(e) "by-laws" means by-laws made by the Association under the authority of this Act;

(f) "land surveying" means the determination of any point or of the direction or length of any line required in measuring, laying off, or dividing land for the purpose of establishing boundaries or title to land;

(g) "Nova Scotia Land Surveyor" means the holder, from the Board, of a certificate of qualification as a Nova Scotia Land Surveyor;

(h) "regulations" means regulations made by the Board under this Act.

(2) Where in any enactment, regulation, deed, lease or other document there is a reference to the Association of Provincial Land Surveyors or to a Provincial Land Surveyor, the reference shall be and shall be construed to be a reference to the Association of Nova Scotia Land Surveyors or to a Nova Scotia Land Surveyor, as the case may be.

3 Said Chapter 243 is amended by striking out the word "Provincial" in the first heading and wherever it apears in Section 2 to Section 21 except in subsection (1) of Section 17 and substituting therefor the words "Nova Scotia".

4 Subsection (1) of Section 9 of said Chapter 243 is amended by inserting immediately after the word "training" the words "in Nova Scotia",

(a) in the sixth line of clause (c), and

(b) in the eighth line of clause (e).

5 Section 12 of said Chapter 243 is amended by striking out the word "April" in the first line thereof and substituting therefor the word "May".

6 This Act shall come into force on and not before the first day of July, 1968.

No. 18 BILL 1968

An Act to Amend Chapter 243 of the Revised Statutes, 1967, the Provincial Land Surveyors Act

Explanatory Note

1 The title of the Act is changed from Provincial Land Surveyors Act to Nova Scotia Land Surveyors Act.

2 The purpose of this amendment is to change the names of the Association and the Board to the Association of Nova Scotia Land Surveyors and the Board of Examiners for Nova Scotia Land Surveyors, and to make reference in statutes and documents applicable to the new name.

3 All references to the Association, Board or Land Surveyors throughout the Act are by this amendment changed from Provincial to Nova Scotia, except in Section 17 (1).

4 The purpose of this amendment to Section 9 is to require that the part of the training period consisting of actual practice in the field be spent in Nova Scotia.

5 Section 12 is changed so that examinations will be held at Halifax in May instead of April.

6 These amendments are to come into force on July 1, 1968.

(This Explanatory Note does not form any part of the Bill but is offered in partial explanation of its contents.)

THE TRAVERS AND CLOSURE

BY P. L. DODGE, N.S.L.S. — HALIFAX, NOVA SCOTIA

The plane is 40,000 feet over the Sahara streaking south to Lagos at 700 miles an hour. You sit in your seat, sip a scotch and wonder what you will survey on the vast continent of Africa. You worry a little that you can do this unknown job. As the plane glides down you see the mist of early morning rising over a sea of green plains puncuated by tall tufts of green. By the time you know these tufts are palm trees, the runway is racing by and the thud of wheels hitting asphalt sends a lump into your throat and sets your temples pounding. You are there, West Africa, Nigeria. You shuffle down the isle and when you step through the door to the warm humid air bearing a thousand strange odors, you will, from that moment either hate or love Africa.

From that exact time, so indellibly impressed in my mind, I have been enchanted with the enchanted continent. I consider it to be my good fortune. It took me two hours to get through Customs and that with the assistance of the Canadian Assistant High Commissioner. That unhappy man drove me the twelve miles into downtown Lagos through a catch as catch can maze of vehicles driving on the left, generally, but mostly driving anywhere there was room to go, horns blaring, goats bleating and women with baskets on their heads showing agile indifference to the vehicles aimed at them. On that drive I was exposed to more new sights, sounds, smells and feelings than most people experience in a lifetime. It was only a humble beginning. Lagos suddenly appeared from behind a bend in the road and for one brief second I thought that I was back in Montreal. It is a beautiful city of modern skyscrapers on wide tree-lined boulevards, with circular parks fronting on the warm shores of the Atlantic. Where it is not modern, however, it is crowded with cement and mud houses with tin roofs, and people, scurrying about with goods for sale, baskets for market goods, women with babies tied to their backs, and little boys selling cola nuts, or chew sticks, or cigarettes or soap or anything portable. Later on, on my Honda I used to love to go to these areas and let my curiousity run wild. I never ceased to find more new and exciting things.

I met my employer, was told that I would be crossing the country to do controle surveys for Shell Exporation. He did not know more than that. I was taken to a rest house maintained by the company, an infamous place of many parties, a large house surrounded by trees and acres of lawn. I was met at the door by a servant who wrested my suitcase from me and bid me the greeting which is synomonous with West Africa hospitality "Welcome".

A young fellow from Ottawa lived there permanently and it was he who took me on my first introductory tour of Lagos and it's nightlife. Anything goes as I soon found out. The people have fun like they drive, all out and no holds barred and pity if you are shy. I stayed in Lagos for a week resting up, supposedly.

I flew down to Port Harcourt, in the eastern region which is now the Republic of Biafra, reported to Shell Oil and was given a house to live in. They soon outfitted me with field equipment and a Dutch fellow councilled me on the ways and means of hiring a crew. I was introduced to a young fellow called Akpan Obo Unta who became my contractor, supplying people for me, supervising them, firing them and expediting the work. Next came a job to do. From existing control I was to demarcate the boundaries of Oil Mining Lease Claims, building a huge concrete momument on each corner. I trained people to do the instrument work. It took me five minutes to teach my headman to read a T2 angle. He taught others to set up targets and we were away. My men were Ibo Biafrans, risked their lives to go outside their own region to work. Finally it became so bad they did not dare and much as it hurt them to lose the job, they would not cross the River Niger (It makes me very sad that two million of these people have been killed in the last six months by people who crossed the River Niger to get them, and that with lots of assistance from the Russians and the British).

When politics became very bad I decided to leave Nigeria for a trip. I wanted to go through the Congo to South Africa but many people were killed in the Congo attempting to do this so instead I made a slow leisurely trip up toward Timbuctou hoping somehow to see this isolated city. I met some other people who also had this hope including the most unlikely; an eighteen year old very beautiful English gird who had hitch hiked 2000 miles and had only the last and nearly impossible 200 miles to go to, as she put it "satisfy my curiousity about the world". She finally made it by hooking a ride with a Russian pilot flying supplies to Sahara. I made it on a Russian 30 ton truck so loaded with cement that we had to block the back wheels with cement bags and jump our way up the few slight hills.

There is no space in this periodical for a detailed description of what I saw and experienced on the African Continent. It is not as one thinks. It is forging ahead as I imagine our west forged ahead. Africa is a sea of activity, of people working at a frenzied pace to claim their share of the plenty that we have. They suffer their setbacks and often the direction is not what it should be but the goal is the same and the desire is there to build and to have. Once experienced, never forgotten.

CITY WANTS SURVEY SCOPE INCREASED

Halifax wants the provincial government to increase the scope of a land surveying, mapping and registration program in the metropolitan area, being financed by federal funds.

The Atlantic Development Board earlier this year granted $4,000,000 to assist the Atlantic Provinces with the program, which will cover 15 years.

After 1970, assistance will be considered on a cost-sharing basis with the provinces.

Nova Scotia's share of the grant is $923,000, and will cover the establishment over the next two years of a co-ordinate control survey system and for aerial mapping in the province.

However, existing city aerial mapping is based on photography taken in 1960, and does not reflect recent development.

The city wants the province to update this aspect, and especially take in the annexation area.

REVIEW OF PLANNING ACT DUE

A major review of the Nova Scotia Town Planning Act is to undertaken this year, Municipal Affairs Minister Donald C. MacNeil said recently.

The department intends to ensure that the provisions of the province's planning legislation are updated to encourage and contribute to the orderly growth and development of Nova Scotia's communities, he said.

To advise the minister during the review, a committee consisting of representatives from planning boards, the legal and planning professions, and land developers, would be established. Regional meetings would be held to hear submissions from local government and interested groups.

The review would be under the general direction of R. S. Lang, the department's director of community planning. His staff will be assisted by Professor R. M. Bryden, an authority on community planning law in Canada.

SURVEY ERROR DEPRIVED CANADA OF $164,400

POINT ROBERTS, Wash. (CP) — On the southwestern tip of Canada's West Coast stands an imposing pillar immortalizing in tough Scottish granite a survey error that cost Canada 822 feet of coastline.

The monument is No. 1 marker, delineating the 49th parallel as the boundary between Canada and the United States under terms of the Treaty of Washington, signed June 15, 1846. In point of fact, the marker and the boundary at that point are 822 feet north of the true parallel.

With waterfront property in the area selling at $200 or more a foot frontage, the error has deprived Canada of land worth a not insignificant $164,400.

Under terms of the treaty, the survey was carried out by a joint British-American party commissioned to mark the dividing line between the two countries from the West Coast to the summit of the Rocky Mountains.

On completion of the work, the British commissioner sadly reported:

"We are greatly disappointed by the discovery of somewhat large discrepancies of of accuracy."

He attributed this to prevailing physical causes offseting instrumental observations "which were quite beyond our control."

Other discrepancies: The International Peace Arch at Douglas, B.C., is 824 feet north of the true parallel; the marker at Huntington-Sumas is 936.5 feet north and that at Kingsgate, B.C., 22.3 feet north.

HOW TO KILL AN ASSOCIATION

Associations of all kinds are beginning to flourish in Canada — largely as a result of a few far-sighted individuals who realize that much can be accomplished by discussion of mutual problems and by presenting a united front when speaking for the industry.

There are, however, those who belong to some of these associations who fail to contribute anything to their progress. We summarize herewith fairly foolproof methods of killing an organization.

Get sore if you are not appointed on a committee but if you are, do not attend committee meetings.

If you're asked by the chairman to give your opinion regarding some important matters, tell him you have nothing to say. After the meeting, tell everyone how things ought to be.

Do nothing more than is absolutely necessary; but when other members roll up their sleeves willingly and unselfeshly; to help matters along; use your ability to howl that the organization is run by a clique.

Hold back your dues as long as possible, or don't pay at all.

Don't bother about getting new members. Let the secretary do it.

When a dinner is given, tell everybody money is being wasted on "blowouts" which make a big noise and accomplish nothing.

When no dinners are given, say the association is dead and needs a can tied to it.

Don't ask for a dinner ticket until all are sold.

Then swear you've been cheated out of yours.

If you are asked to sit at the speaker's table, modestly refuse.

If you are not asked, resign from the association.

Don't tell the organization how it can help you; if it doesn't help you, resign.

If you receive service without joining, don't think of joining.

If the association does not correct abuses in your neighbour's business, howl that nothing is done.

If it calls attention to abuses in your own, resign from the association.
Keep your eyes open for something wrong, and when you find it, resign.
At every opportunity, threaten to resign and then get your friends to.
When you attend a meeting, vote to do something and then go home and do the opposite.
Agree with everything said at the meeting and disagree with it outside.
When asked for information don't give it.
Curse the association for the incompleteness of its information.
Get all the association gives you, but don't give it anything.
When everything else fails, cuss the secretary.

SYMPOSIUM ON LAND REGISTRATION AND DATA BANKS

There will be a Symposium on Land Registration and Integrated Environmental Data Banks during the week of Novamber 4, 1968.

The Symposium is sponsored by the Canadian Institute of Surveying and will be held at the University of New Brunswick in Fredericton.

The Symposium is presently being planned. A preliminary programme is appended

Session 1

Basic considerations for the design of integrated environmental data banks

Papers:

1. Objectives of Integrated environmental data banks
2. Control Surveys as a foundation for an integrated system of data banks
3. Technical Problems in the design of a good foundation system

Session 2

Potentialities of an ideal data bank

1. Land Titles
2. Assessment
3. Lang Management in Urban Areas
4. Land Management in Rural Areas
5. Population Statistics
6. Land Management for Industrial Purposes

Session 3

Technical Problems in the Software Design of Data Banks

1. Questions the computer Analyst needs to have answered
2. Consideration of Reliability, Speed, Cost, Secrecy requirements
3. Geometric description and Numbering System of Land

Session 4

Existing and suggested systems of Data Banks

1. Arda C.L.I.
2. DBS
3. Culdata
4. District of Columbia Land Data Bank

Session 5

Panel of Users (no prepared papers)

1. The Legal Profession from the point of property law
2. The legal profession from the point of society
3. The Surveyor
4. The Resource Manager
5. The Municipal Engineer
6. The Assessor
7. The Social Science Profession

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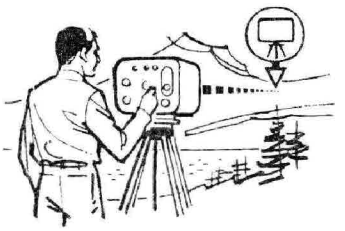

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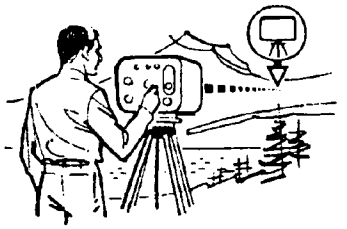

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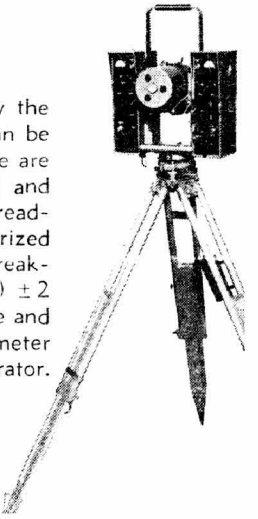

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NOTICE

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OF NOVA SCOTIA

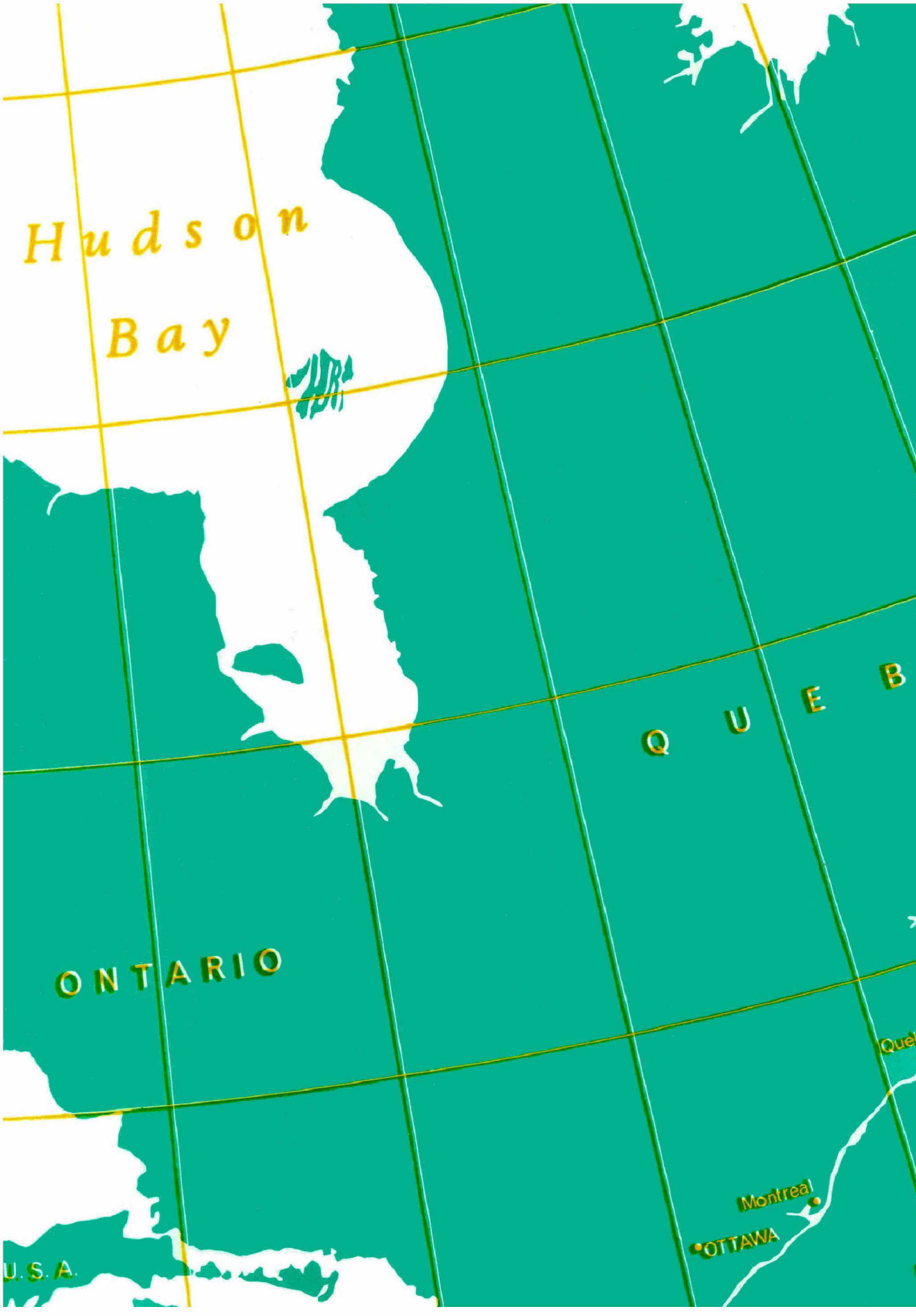
The 18th Annual Meeting Of The Association

NOVEMBER 1 and 2, 1968

AT THE CITADEL INN

HALIFAX, NOVA SCOTIA

PLAN NOW TO ATTEND THIS MEETING. BY ATTENDING YOU MAY SEE HOW THE ASSOCIATION CAN HELP YOU TO HELP THEM.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