

The NOVA SCOTIAN SURVEYOR



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THE CENTENNIAL SURVEY MONUMENTS

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Let me first explain the capacity in which I am writing. As you perhaps know, there is a council of government surveyors in Canada called The Canadian Advisory Council on Cadastral Surveys. This Advisory Council is composed of Surveyors General, Directors of Surveys, and similar government officials who meet in the various provinces and Ottawa to discuss problems of mutual interest and to apply their collective knowledge and experience to problems existing within the field of Canadian property surveying and related areas. The Advisory Council has certain committees reporting to it and one of these committees is the Centennial Committee, of which I am chairman. It is then as chairman of the Advisory Council's Centennial Committee that I write. This committee is composed of A. I. Bereskin, Controller of Surveys in Saskatchewan, H. B. Robertson, Director of Surveys in Nova Scotia, and myself.

In 1964 the Advisory Council decided to consider a centennial project for our centennial year. The original concepts presented in the Advisory Council meeting were varied and were basically divided into three areas. One was the idea of monumenting the longest north and south straight line in Canada; secondly, the placing of certain geodetic control monuments; and thirdly, certain small highway parks in various areas of Canada.

It was decided by the Advisory Council that the new era of land surveying that the next 100 years would cover was personified by the attempt in all provinces across Canada to develop a geodetic horizontal control system with a third-order density. It was felt that this improvement in property surveying best illustrated our transfer into the second 100 years of confederation and also the closing 30 years of the twentieth century. It was decided to ask the provincial governments, the federal government and the administrative council of the Yukon to place geodetic control markers in the foreground of each legislature in Canada, to relate these to each other geodetically, by azimuth and distance, to specify their height above sea level and to thereby portray in a real and physical manner the connecting together of all parts of Canada. It was also visualized that the geodetic control monument would be embellished by some form of ceremonial marker.

All governments responded to the federal government's invitation and all agreed to participate and erect the ceremonial markers and geodetic control monuments. Further, all governments have agreed to dedicate simultaneously, at exactly the same time across Canada on the summer solstice — 2:30 E.D.S.T. on June 21, 1967. On this day,

the premiers of each province (or their delegates) and the federal officials of the areas concerned will dedicate the ceremonial monuments and geodetic markers. In many of the monuments there will be a place for a document cache or a time capsule into which messages to our colleagues of the future will be placed, together with material representative of our present civilization. The time capsule will be opened in 100 years' time at Canada's 200th birthday. The Advisory Council has arranged with each of the provinces to place on each of the monuments a single common bronze plaque. Although the ceremonial markers will be different in form from province to province, the dedication plaque will be the same. The wording reads —

SURVEYING FOR THE FUTURE

This survey monument and plaque is dedicated to the surveyors of Canada whose skill and industry contributed so greatly to the exploration, mapping and development of our nation.

It is a symbolic of the beginning of the second century of surveying in Canada and is a first post in a unified system of precisely co-ordinated survey points.

With eleven other centennial survey monuments erected across Canada, it signifies the contribution by surveyors, both past and present, to the charting of our nation's future.

The Advisory Council hopes that this centennial project will commemorate a new era in land surveying and portray the resolve of all of the governments of Canada to progress together in an ancient and specialized profession of land surveying. It would also like to think that this project symbolically monuments the starting point, the point of commencement, for the next 100 years of confederation, with, we hope, Canada's surveyors once again taking an active and vital role in the charting of our nation's future.

British Columbia has a rather intriguing monument. Running from the geodetic control monument is a monument in which an observer can actually stand. Looking along the plane, one is oriented to the true geographic pole and on one circle will appear the latitude and on another circle the longitude. The monument will be constructed in either stone or raw steel, with the use of acrylic or baked enamel finishes. I understand color will be introduced if the final marker is made of raw steel.

Alberta. The common plaque and a second plaque giving the technical details of the monument will be on a slab of granite set in a landscaped area in front of the Parliament Building and the geodetic monument will be to the front on the flagstones.

Saskatchewan has a three-sided stone obelisk nine feet high with an eternal flame on the top. On one side of the monument will be the bronze plaque detailing its position, etc. On the second side, the history of the last 100 years of Canada, specifically in the Saskatchewan area, will be carved in the stone. Significant developments, as they occur in each decade over the next 100 years, will be carved on the third side.

Manitoba has its common bronze plaque and all the basic requirements concluded but is still undecided on the final form of the monument. It will most likely be in the same form as Alberta or Nova Scotia.

Ontario. The control monument is set inside an eleven-sided granite obelisk, which sits on a two-tier granite base, and the names of the eleven participating governments are carved down the eleven faces. This is set inside a small flagstone plaza, at the back of which a nine-foot slab of granite supports a second slab with an elevated face. On this elevated face is an eight foot by four foot stainless steel plaque on top of which is

placed a map of Canada, in bronze, in mosaic or jigsaw form, showing the locations of all the monuments. The bronze dedication plaque and the common plaque are at the side of the map. In the drawing, the rear of the monument is shown as a deciduous hedge with bedding plants and the Ontario motif and the centennial motif. I understand this portion of the monument may become more substantial, with perhaps a stone wall and the patterns picked up in stone mosaic. Under the plaque is a time capsule into which official documents, letters and historical material will be placed.

Quebec. The marker is a modern form of double obelisk or pillar, between which is suspended a sphere. This is set in a paved area with the shadow of the central pillars forming a sundial. The area is landscaped and surrounded by sculptured hedges.

New Brunswick. The monument is integrated into a total area concept which covers a much larger area. There is a 30-foot-high stone obelisk at one end of a paved pedestrian mall or plaza. At the other end, we have the geodetic monument and the embodiment of the plaques on a stone wall at the back. In front of the wall, a stainless steel dome protrudes approximately three or four feet through the center of a pool of water, with water gushing over the dome, from the top, into the pool. In the center of the dome is the geodetic point with tripod ledges. Alongside, we have a similar dome, with water, and with an eternal flame in the center.

Nova Scotia has a monument similar to Alberta — a slab of granite with the two plaques in a landscaped area.

Prince Edward Island has decided to place its plaque in Confederation Square in Charlottetown; the existing area will be utilized for the embellishment and the monument will be placed in the actual flagstones. The monument will become a part of the Square itself.

Newfoundland will have a more traditional form of obelisk — four-sided granite, with plaques on two of the sides. The geodetic monument is in front of the marker.

Yukon Territory. The Newfoundland design is to be used at Whitehorse by the federal government.

Ottawa. The Ottawa monument will be placed on Nepean Point near Parliament Hill close to the Champlain monument, which appears on the front cover of *Men and Meridians*, Vol. 1. It will take the form of a modern obelisk, with a hollow center for the document cache or time capsule. The area is landscaped and paved and the background wall forms the back drop for the common plaques.

PROVINCE OF NOVA SCOTIA'S

GEODETTIC SYSTEM UNVEILED

NOVA SCOTIA LIEUTENANT-GOVERNOR MacKeen unveils Centennial Survey Monument on grounds at Province House. The monument, unveiled simultaneously with monuments in nine other provinces plus Ottawa and Whitehorse, will provide a national system of survey reference points. (Jarvis Darville, Halifax Photo Service)

June 22 — A cross-Canada system of geodetic control posts — including one on Legislative grounds at Province House in Halifax — was unveiled yesterday.

Demonstrating land surveying and precision measurement, the monuments are a centennial project and will result in a network of precise datum points all related to each other through a horizontal control system.

FIRST POST

Unveiling the Halifax monument was Lieutenant-Governor MacKeen, who said the monument would "be the first post in a new era of surveying and mapping in Nova Scotia".

The monuments are dedicated to the surveyors of Canada.

The lieutenant governor said surveying and mapping contributed in a continuing way to national growth and well-being "and to the fundamental order and symmetry of our urban communities."

Attorney-General Donahoe, introducing Mr. MacKeen, told assembled dignitaries the survey monuments originated from a proposal from the advisory council on cadastral surveys and had been participated in by all provinces plus Ottawa and Whitehorse.

Each monument carries a plaque which delineates the latitude and longitude; the elevation above sea level and the azimuths and distances to the monuments in Ottawa and neighboring provinces.



LAND OWNERSHIP

The Institute of Cartographers of Western Australia

September 1966

Land Ownership by C. H. Wilson, M.I.C.W.A.

C. H. WILSON, M.I.C.W.A., Chief Draftsman, Land Titles Office, Crown Law Dept.

Certainty of Title, or proof of ownership of land, is something that is taken very much for granted in Western Australia.

However, this confidence is no mere coincidence but the result of a combination of legal and cartographic functions, possibly little known to the general public, and briefly outlined in the following article.

On the founding of Western Australia in 1829 the existing laws of England, applicable to land were adopted for the new colony. All land was held of the King under the feudal system. The greatest interest in land that a subject could hold was "an estate in fee simple".

Grants of land were made to early settlers by the King's representative, generally grants in "fee simple" for various reasons such as performance of duties, rewards for services rendered, or monetary considerations.

In 1832 it was found necessary to establish a registry office for the purpose of recording particulars of transactions in land.

In South Australia, Robert Torrens, the Registrar of Deeds, and formerly a Commissioner of Customs, envisaged the idea of introducing into land dealings some of the methods associated with the registration of shipping. The outcome of this idea was the Real Property Act, which was passed in 1858, and introduced the system of land registration now commonly known as the "Torrens System".

This system proved to be so successful that it was subsequently adopted by every Australian State, and in a modified form in many parts of the world. It was first introduced into Western Australia by the Transfer of Land Act in 1874, which was later repealed and replaced by a new Act in 1893. This latter Act, as amended from time to time, is the one under which the Office of Titles now functions.

The impact of the "Torrens System" upon land tenure is of sufficient importance to warrant elaboration on some of the advantages of the procedure involved.

Its principal advantages are security, simplicity, accuracy, economy, expedition and suitability to circumstances. It aims to simplify land dealings, to give certainty of Title, to facilitate proof of ownership and to give an indefeasible Title guaranteed by the State.

The outstanding distinguishing feature of the "Torrens System" is undoubtedly the Certificate of Title. This is a statement — literally a Certificate — that by virtue in the first place of a Crown Grant, followed by a series of dealings and frequently plans of subdivision, documents are registered in the Office of Titles which justify the issue of the Certificate. It does away with the search into the past history of the land, and at date of issue gives an exact statement of the registered owner together with all rights, interests and encumbrances concerning that land.

Two copies of each Certificate of Title are prepared, the Original being filed in the Office of Title, and the Duplicate held by the registered proprietor or mortgagee.

The advantages of the Torrens System may well be appreciated if consideration is given to the difficulties which were, and still are encountered, in order to ascertain the ownership and other interests of land held under the system in use before the advent of the Transfer of Land Act. Under this previous system it is necessary to examine in the Deeds Office all documents lodged which affect the land, from the original Crown Grant, down to the document placing the land in its current ownership.

This series of documents is generally known as the "Chain of Title", and any material defect in any document may easily destroy that chain.

The establishment of this "Chain of Title" may well entail a most arduous and complicated search, without arriving at the same degree of certainty and assurance that is so readily available under the Torrens system.

We in Western Australia are particularly fortunate that during the years between the establishment of the colony in 1829 and the passing of the Transfer of Land Act in 1874, the progress and development of the State was relatively slow. In consequence, little land is still held under the old system, compared with the situation existing in the earlier developed Eastern States.

The principal functions of the Office of Titles are the registration of dealings and surveys which affect privately owned land, that is land both town and country which has been alienated from the Crown. The Lands and Surveys, Mines, and Forests Departments control all matters affecting Crown Lands.

It is important to realise that all Certificates of Title stem from Crown Grants issued by the Lands and Surveys Department, as the land held in the Certificates of Title is subject to the reservations and powers contained in those Grants.

It is also worthy of mention here, that in 1909, by an amendment of the Transfer of Land Act, provision was made for the registration in the Office of Titles, of Crown Leases. This was done in order to facilitate the registering and recording of certain documents affecting the land in those Crown Leases.

From the very small office necessary to cope with the requirements of the State at the time of the passing of the first Transfer of Land Act in 1874, some idea of the growth in volume and value of privately owned land transactions may be appreciated when it is realised that during the year ending 30th June, 1965, the considerations expressed in dealings registered in the Office of Titles were approximately \$330,000,000. As well as the considerations mentioned, there is of course the value of land affected by resumptions and devises under wills and gifts.

During the same period, a total of 92,000 documents were registered, or an average of about 370 legal documents lodged each day. Approximately 14,000 new Certificates of Titles were also prepared during the year, and there are now over 500,000 original Certificates of Title filed in the office.

The unique method of filing these Certificates of Title, which must always be immediately available to the general public on request, is one in which great imagination and ingenuity has been successfully employed. The office is justifiably proud of this method which is peculiar to this State and is well worthy of inspection.

Insofar as surveys are concerned, about 1,600 new surveys were lodged during the year ending June, 1965, making a total of about 33,000 diagrams and 9,000 plans registered in the office.

In addition to these surveys, innumerable documents of varying types were registered, such as easements affecting land, often of considerable value and importance. These documents include plans and sketches which must correctly and accurately define the land concerned.

The method of document recording on Microfilm is a new venture upon which the Titles Office has embarked. The concentration of documents and other records which are to be retained permanently must inevitably consume any security storage space allocated. As the State expands, a greater demand is being made upon all records by the public, other government departments, and the Titles Office itself. For the more efficient dissemination of the information contained in plans, diagrams and other records, the project offers considerable possibilities. The microfilm record is also more easily transported to a safe area in times of international unrest.

It is generally recognised that the survey system in Western Australia is of a particularly high standard, and there is a separate section of the Survey Regulations which

controls surveys affecting land under the Transfer of Land Act.

The examination and checking of all surveys before approval has always been of a very high standard and exercises a strict control of surveyors, who must comply with the requirements of these Survey Regulations. Before any plan or diagram may be registered in the office it is first necessary for the surveyors field notes to be lodged.

This combination of good surveying and strict examinations has enabled the Office of Titles in Western Australia to establish and maintain an excellent standard of accurate plans and diagrams which is reflected in the confident and ready acceptance of all information shown on these records.

A major change was made in the Office of Titles in 1948, when the staff employed upon the examination of surveys was transferred to the Lands and Surveys Department and placed under the control of the Surveyor General. Here it combined with the staff employed upon the examination of surveys for the Lands Department to form the Survey Examination Branch, administered by the Inspector of Plans and Surveys.

From the figures previously mentioned, concerning the volume and value of dealings which are registered in the Office of Titles, it is most evident that in transacting business of this magnitude, it is essential that the accurate definition of land affected in any way should become a matter of vital importance. In addition to this are the many and varied legal matters with which officers of this department must be fully conversant in order to efficiently interpret and give proper effect to the laws and regulations applicable to land in this state.

It is imperative that all information shown on plans and other records in this office be adequately and accurately displayed so as to be readily available and adopted by those members of the public, their solicitors and agents who are interested in land transactions. This also applies to information available to the members of the surveying profession to enable them to perform surveys in such a manner as will be accepted and approved by this office.

These matters involve the staff in the drawing, compilation and maintenance of accurate plans and maps for the provision of this vital information.

Insofar as Certificates of Title are concerned, all information shown thereon is guaranteed by the State, and, as the land, its buildings, rights and encumbrances are frequently of considerable value, the absence of up to date and accurate plans could easily lead to errors, and involve the Government in substantial and costly claims.

Over the period of years that the Office of Titles has been in operation, figures have substantiated that this office has been, and is, a true barometer of the growth and prosperity of the State. It has also been noted that sudden major fluctuations in business have been influenced to a greater extent by international rather than national events.

Western Australia is at the brink of a new era of prosperity and development. Many major projects and undertakings are either in progress or are envisaged. What effect will this have on the future of the Office of Titles?

As new areas are opened up, an increasing amount of land will be alienated from the Crown, and come under the Transfer of Land Act. This in turn will result in an increasing number of new subdivisions and the growth of towns and cities. In these expanding towns and cities buildings will become of greater value, and land dealings more complicated.

It seems obvious that the office which governs these matters must of necessity expand in size and responsibility. Thus it becomes of paramount importance for all those associated with the Office of Titles to see that the standard and accuracy of its surveys and plans be maintained, in order to adequately cope with the times ahead when the present figure of \$330,000,000 for the annual value of land transactions will ultimately fade into insignificance.

RE-FORESTATION

(By J. E. R. March, P.L.S.)

Reforestation is now going on in a big way. Governments, pulp and lumber companies, and even the small woodlot owners are striving to preserve their woodlands to might think. When was it started here? Almost half a century ago, that's when. Who started it? Victor Garrison and Dusty Larch, that's who.

Vic and Dusty were land surveyors. They were surveying the timberlands belonging to Fallinggirth and Weakknee. Vic was the boss and Dusty in charge of one of his crews. They were camped near Highland Lake.

It had rained for almost a week and the road to the camp was so bad the tote team could not get in. Very few supplies were left, and there was no fresh meat. Something had to be done and done quickly.

meet the ever increasing demands for wood products. In Europe reforestation is an old story, but on this side of the Atlantic it is quite new. However it is not as new as you

Dusty decided to shoot a deer. He took the old double barreled twelve gauge with a couple of ball cartridges and went up on the hardwood ridge back of the camp. He saw a big buck and it was coming straight towards him. The antlers on that buck looked big as an apple tree. Dusty kneeled behind a bush. When the buck was about thirty feet away Dusty stood up, aimed quickly and pulled the triggers. He heard two dull clicks as both shells failed to explode.

The deer took off in high gear while Dusty kept aiming the gun and snapping the hammers. After a time one shell went off, and after a few more snaps the other went also. Both missed of course. When Dusty returned to the camp and told his story they all laughed in disbelief.

What has this to do with reforestation? Be patient, you will soon find out.

The sun came out the next day just before noon. The survey gear had been left in the woods before the rain and Vic and Dusty decided to go out and bring it back to the camp.

"Better take the gun along", said Vic.

"I'll take my pistol", Dusty replied "It's better than that thing".

Dusty had a long barreled twenty-two revolver. He used it for shooting grouse and porcupine. The porcupines were for Zilby Wink, one of his axmen.

Zilby's home was in the county where a bounty of fifteen cents was paid for each porcupine snout. Zilby however did better than that. On each porker Dusty shot for him, he collected the bounty for five snouts. The real snout and another manufactured from each paw. It needed an expert to tell them apart. This worked fine for Zilby until the municipal clerk in his home county began to smell a rat. Maybe it would be better to say he smelled a snout.

However Vic took the old twelve gauge along, and a little more than a mile from the camp there was a big cow moose feeding in the open hardwood.

"Down her" said Vic "that is a dry cow and we need the meat."

"No. You do it," said Dusty.

"No. You", said Vic.

While they were arguing the cow kept right on feeding and moving towards the tote road.

Vic being the boss Dusty lost the argument so he took the gun and crawled up close enough for a good shot. Aiming carefully he squeezed the trigger. Just a dull click, not even loud enough to attract the cow's attention. Maybe she knew or thought she knew that cows were protected at that time.

Dusty took the shell out of the gun. He left the gun there and crawled back to Vic.

"See that dent in the primer?" he asked "Now do you believe me?" Then he crawled back to the gun and put in another shell. He waited until the feeding cow was headed

away from the tote road, hoping she might run a short distance before she fell. Then he fired. This cartridge was a good one and down she went, less than a hundred feet from the tote road.

Reforestation? We're coming to that now.

Vic and Dusty knew a group of game wardens and rangers would be coming along that trail any time. They were behind schedule, building a camp at Bunting Lake, and at the first sign of fine weather would be back to work.

"Dusty" said Vic, "go out the road about half a mile. If they come along don't let them see you. Let them past and then fire two quick shots with your pistol. Remember, keep out or sight. Give me one hour, then come back here." Dusty went.

He looked back a couple of times and that dead cow loomed up in the open hardwood like the Olympic anchored in the middle of Bedford Basin. (the Queen Mary and the Queen Elizabeth were still to be designed).

Dusty waited a little more than an hour and was about to start back when he saw the rangers coming. He hid and let them pass, then followed at a safe distance. Watching them he was amazed to see all those game wardens go past the place where he had left Vic and the moose with never a second glance in that direction. He was even more amazed as he came closer. There was no sign of either Vic or the moose. Then he heard a chuckle. Vic was hiding behind a tree and the moose was in the same place as before but now she was just about invisible in the thicket of young spruce trees. Then Dusty understood.

While he had been waiting out the road, Vic has gathered up all those little spruce trees and replanted them around the cow, after removing her insides.

Come on," said Vic "we'll have to hurry to get that survey gear in before dark."

That night they took a shovel and a couple of lanterns and went back with three more men. They quartered the moose with the hide still on. Then they cut shoulder straps right in the hide and carried her back to camp. That's the best way to carry a moose, providing you know just how to cut those shoulder straps.

Before starting back they dug four shallow pits. They formed a square and were about ten feet apart. Into the pits went the head, legs and insides of the cow. They had to be buried to keep the crows from giving away the location to the game wardens.

Some of the trees Vic had replanted had been cut with the little axe he always carried in a leather case on his belt. He was careful no fresh axe marks were visible from the tote road, and thus excite unwanted curiosity. Wise woodsman, that Vic.

Other trees he simply pulled out of the soft earth, roots and all. Dusty stood one of these in each of the pits. He tramped some loose earth around the roots and sprinkled dead leaves over the top. Must have been good fertilizer because those four trees all grew. The others died the following spring.

Any time you go in to Highland Lake, look about a hundred feet south of the tote road when you are half way across that last big block of open hardwood. See those four spruce trees standing straight as flagpoles and forming a perfect square? That was the start of reforestation in this country.

How come I know so much about this? I'm Dusty Larch. That's how come.

R.E. Millard, Esq.,
Superintendent of Streets and Sewers,
Liverpool,
Nova Scotia.

Dear Eric:

Enclosed are two (2) copies of what I would have said in the panel discussion had I had time to prepare properly.

I have sent a copy to Bert Robertson so he will be able to make appropriate comments in light of what I have said. The order of publication will be that of the speakers which were Robertson, Doig, Servant and Daykin.

Thanks again for the magazines.

Yours truly,
John Pope, President.

A SURVEYOR'S VIEW OF A COORDINATE SYSTEM

The object of this account is to explain how the practicing surveyor can use a coordinate system — especially to say what he is given to work with and to what extent he must employ mathematics.

Any coordinate system brought into use over a large area (say a province) is designed by the geodist who must consider among other things:

- a) The size and shape of the area and,
- b) the relative precision of the work to be done within the system.

The geodist is faced with the problem of representing the curved surface of the earth by a plane. Distortion is inevitable. However, the land surveyor does not ordinarily work to a precision better than one part in ten thousand parts. Hence if the distortion in the system is not greater than this the user cannot detect it. The result will be that **FOR THE LAND SURVEYOR A KNOWLEDGE OF LATITUDES AND DEPARTURES IS ALL THAT IS NECESSARY TO USE SUCH A COORDINATE SYSTEM.**

Once the geodist knows the limiting factor he designs the system and culminates the work by calculating the rectangular coordinates of those existing control points in the province for which positions have been determined with an accuracy equal to or greater than that desired. These coordinate values are given to the provincial government and it makes them available to anyone who wishes them.

It usually happens that the existing control is not sufficiently dense to be of immediate use to the land surveyor and the provincial government must establish more monumented control points.

Assuming that this had been done in an area in which a land surveyor wishes to work, what does the surveyor encounter on the ground? He finds two intervisible monuments for which a variety of positional data is available. Let it be assumed that there is available only the minimum information, namely the rectangular coordinates of the individual stations. For example:

From this it is evident that both monuments are located east and north of a common beginning point. The location of the beginning point is of no immediate interest. THE SURVEYOR IS INTERESTED IN THE RELATIONS BETWEEN THESE MONUMENTS, for the line between the monuments will serve him as a baseline. The relations wanted are the length of the line between the monuments and its direction with respect to other similar lines in the system. These are obtained as follows:

The surveyor thus is in possession of a base line with the following characteristics:

It is obvious that this calculation can be done at the provincial government level and the results given to the user in the form of a card giving bearing and distance from each monument in the system to all other visible monuments in the system.

From here on the surveyor can use the base line to do one of two things:

a) Either he can record points or objects on the ground in terms of his base line by determining their rectangular coordinates

b) or he can find a point or an object on the ground if he has been given the rectangular coordinates of it.

As an illustration of the second situation suppose the building is later demolished and it is desired to establish the location of the corner armed only with its coordinates, that is the surveyor must solve the problem "where is point E. 944.3, N. 289.9?"

He has only to go back to 7 and run an open traverse to a point which in relation to 7 has a departure of +319.3 and a latitude of -37.5. He may equally well choose to work from 8 in which case he runs a traverse to a point which in relation to 8 has a departure of -791.0 and a latitude of -202.8.

Obviously, this whole argument can apply to any base line whatsoever and in itself is a most elementary proposition in surveying. The benefit of the coordinate system established province-wide is that any thing located with respect to the given base line is located with respect to every other possible base line in the system. Should the two monuments first employed disappear in course of time, every other monument in the system stands as a witness to this baseline and to any measurements referred to it. In practice monuments do disappear or become displaced. A system of inspection and replacement is necessary in order to maintain the desired density of monumentation in any particular area.

Two of the arguments advanced against the establishment of a coordinate system invariably are the mathematical complexity of such a system and the cost of monumentation. The only difficult mathematics involve the geodesist, not the surveyor. The monumentation can be carried out a section at a time where the need is greatest and monumentation is a capital expenditure which has returned dividends wherever used. A case in point is New Brunswick which began such a system in 1959 and is making extensive use of it to their benefit.

Some of the immediate benefits to the users of such a system in Nova Scotia would be:

a) positional control by municipal survey departments in high density building areas

b) systematic preservation of the mathematical description of lot boundaries referred to the system.

c) municipal tax and assessment problems over "lost" and "shifting" lots could be solved permanently.

d) detailed planning for highways and for city fringe areas could be carried out in sections which will later fit together with certainty.

e) mineral land boundaries could be located with greater certainty and less computation than is now possible.

f) existing and future surveys can be integrated and duplication avoided.

A word of warning is necessary lest the user become overconfident. One can only get out of the system what one puts in. If points are referenced to the coordinate monuments with a relative precision of 1 in 10,000. Its the old story: given two decimal places in the answer you can always round off to one place, but with one place only, you can't tell what the second might be.

GRID SYSTEMS SCUTTLE LAND PLANNING, BUT THERE'S A WAY OUT: RE-PLOTTING

From Civic Administration — March 1967

A relatively unknown section of the B. C. Municipal Act is being used with great success to re-shape the District of North Vancouver. It allows a municipality to re-plot existing property lines which were drawn up years ago with little regard for overall planning. It's one of the first attempts yet made in Canada to re-plot on a meaningful scale. West Coast correspondent Bruce Young reports on the progress of the work: SPEARHEADING the property line shuffle is R. D. (Dave) O'Brien, deputy planner, who has been credited with having created 48 such schemes in the past six years and is planning to do many more.

North Vancouver's basic problem is the same as in most North American communities. Property was developed and sold on a grid system because it was the cheapest, simplest approach from the land developer's viewpoint.

However, there are few places where the pitfalls of the grid system are more evident than in the mountainside community of North Vancouver. Apart from the system's overall inability to meet the functional requirements of modern living, it completely disregarded ravines, cliffs, creeks and other topographical features.

Because it was doubly victimized by the grid, it's easy to understand why the municipality has become a leading practitioner of the re-plotting technique.

Eventually, the entire eastern half of the municipality will be re-plotted. Re-plotting on such a scale is only possible in the eastern section because it is not heavily built up. Because there are few buildings in the area, the grid pattern exists mainly in the records of the B. C. Land Registry Office. When land is fully developed on the grid system it's hard to make such adjustments.

Despite this, planner O'Brien contends that the replotting concept could be used extensively in almost every municipality where there is enabling provincial legislation.

Its value lies in the fringe areas of existing development, where the built-up area ends and the farmers' fields (or bush) begin.

Such areas on the edge of town are, of course, owned by some party and the lines are merely an extension of the built-up grid area. Re-plotting can be employed to break the grid pattern, introduce functional planning in its place.

IT'S HIGHLY PROFITABLE

Re-plotting North Vancouver district brings in revenue to the district through increased assessed values and increased property values to the owners, i.e., tax-free capital gain. The district is also able to defray the expense of re-plotting by charging its cost off against the property owners who gain by the program. They pay costs in direct proportion to the gain they make.

The basic approach is to draw a line around the area to be re-plotted. Provided 70 percent of owners agree (one of the requirements of the legislation set out in sections 823-856 of the B. C. Municipal Act) O'Brien can move in and through a process of land exchange and cash adjustment can superimpose an entirely new face on the old grid.

There are many reasons why an area has to be re-plotted in such a manner. One,

of course, is impending residential or other development, another is to obtain the necessary right-of-way for a road — especially when the existing or future traffic flow runs diagonally across the grid, a common North American problem.

The alternative in the latter case is to expropriate, a costly and wasteful approach that North Vancouver district tries to avoid.

WHAT HAPPENS AFTER RE-PLOTTING

Here are some of the things that followed as a result of a series of six re-plotting schemes in one area:

- * A right-of-way was obtained for a badly-needed new road. The district had to buy some land but the cost was far less than it would have been had expropriation been used.

- * Several near-worthless properties (cut off from streets and other municipal services by other properties and topographical barriers) were salvaged, because the entire street system was re-designed to conform to topography.

- * The new, planned lots were of far greater value than before because they were located on attractive, curving streets.

- * The future developers of the land will save many thousands of dollars because planning can reduce the amount of street frontage required to service each lot.

- * Various pockets of municipally-owned land were gathered together to create a 300-acre area that will at some time in the future be sold to a shopping centre developer at a price in excess of \$250,000.

O'Brien says these results are rather typical of any re-plotting scheme. He pointed out that a raw-unserviced acre in North Vancouver is worth about \$4,000. Serviced lots (four or five to the acre) fetch as much as \$5,000 each. Given this kind of gain, owners are usually glad to agree to re-plotting, willing to pay the cost of doing it.

With the cost of putting in services (roads, sewers, water, etc.) currently running at \$44 per front foot (i.e. \$88 per lineal foot) it's important to keep this footage to a minimum for each tax-paying property.

THE REAL SAVINGS

In the grid type of development some 25-28 percent of land area is swallowed up by roads and lanes. With careful planning the percentage of roads in any area can be as low as 18 percent, seldom is higher than 25 percent.

This, says planner O'Brien is one of the greatest inefficiencies of the grid system.

Another wasteful feature of the grid arises in relation to school and park sites. Under a grid system they are rectangular in shape and are serviced by roads on four sides. "There's no logical need at all for so much road access to a park or school — all such areas require are entrances." O'Brien pointed out that tax-producing property can be created around the perimeter areas of schools and parks.

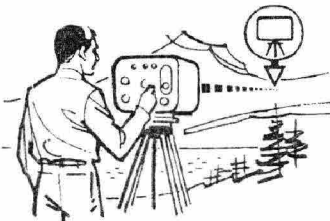
In 48 schemes to date involving 475 owners there have only been 10 serious objectors. Persons in this category are those who make use of the right given them by the legislation to contest only the financial aspects of a re-plotting program before a court-appointed commissioner. In each of the 10 cases the commissioner ruled that the property owner had been fairly dealt with.

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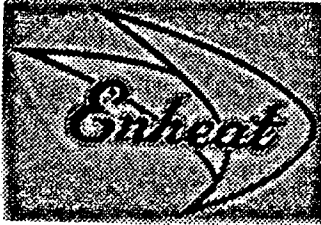


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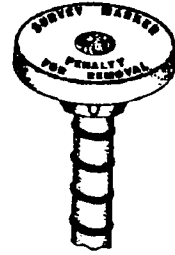
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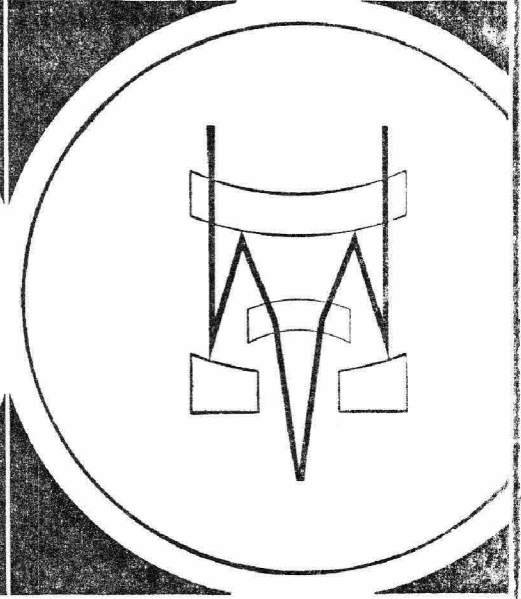
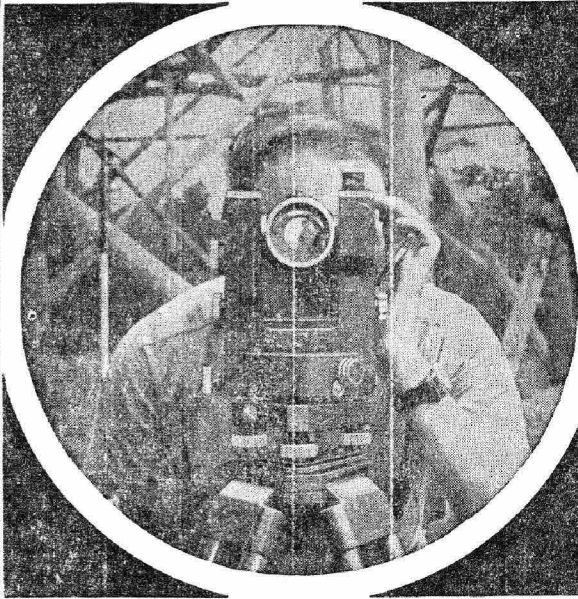
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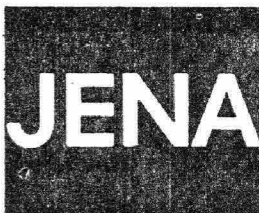
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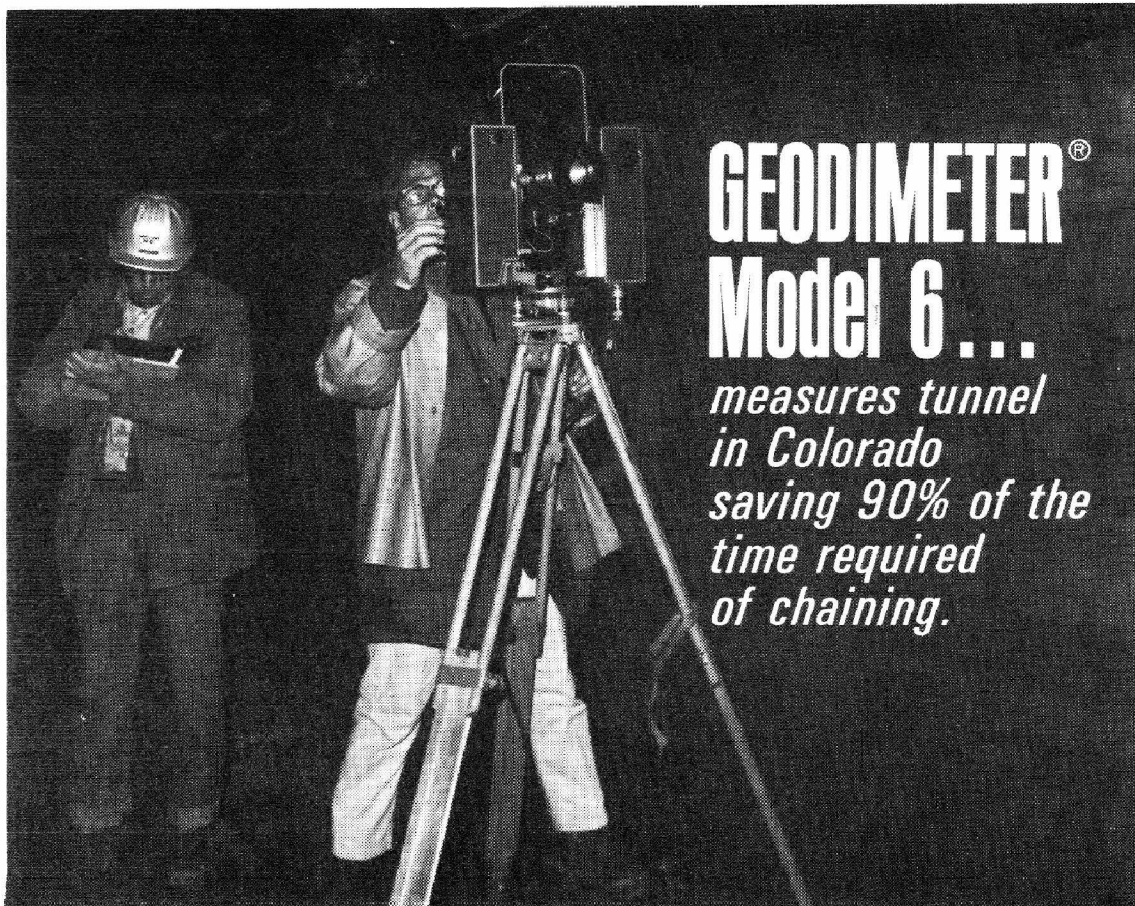
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