

The Nova Scotian Surveyor

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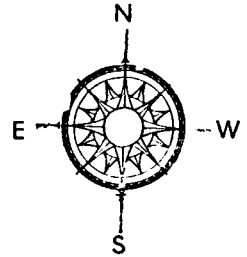
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YOUR NOTE BOOK

CAN ANYONE BUT YOU UNDERSTAND IT?

The Surveyor's note book is a vital part of his work. Sadly enough, many surveyors will exercise extreme care in their measurements and then fail to record them properly in their note books. Some will adopt a system of shorthand of their own, that would put Isaac Pitman to shame. Without question, poorly kept notes have, in days gone by, been the greatest single cause of costly delays in recent retracement surveys.

Different types of survey of course require different note keeping forms. Most of these have been adequately dealt with in text books. However no text book seems to have taken up the problem that the surveyor in this Province has in properly recording a retracement of old grant lines. This work is slow and costly, and the expense can be doubled or halved by the surveyor in charge of of the party. His ability and judgment regulate the speed of the survey, and his notes have an important bearing on the cost. One bearing omitted, or reversed in the field book, or a couple of figures reversed, means no closure when the notes are calculated and plotted some time later. This class of blunder is always the beginning of a chain reaction (no pun intended). The first step is a recheck of all calculations. The next step is to plot the notes, and then by comparison with aerial photos, the error can often be pinned down to one or two possible places in the field. Next comes the return trip to the field, and finally comes the blast. The blast of course being from your superior for the unnecessary extra cost of the survey.

The next most costly source of error, or blunder, is crowded notes, that is trying to put too much on one page.

The ordinary field note book costs about \$3.00, and has 75 pages. One page therefore costs around

four cents. The average cost of a trip to check a figure that is doubtful, or cannot be deciphered, because it is over or under some other figure, could be estimated at about \$40.00, or one thousand times the price of the page you did not save. Is it worth the risk? The value of your field note books cannot be overrated, and deserve your meticulous care. Surveying standards have risen very sharply in Nova Scotia in the past few years. Let us see that our field note books fall in line with our field work, in this respect.

It was intended to publish in this issue a sample set of retracement notes, but space allotted will not permit. Instead, a brief outline of the method will be given. The whole system is based on the idea of giving a number to each corner post set, or reset. To my knowledge, it was first used about 1921, by V. P. Harrison, P. L. S., when conducting a survey for an American company, with timber holdings in this province. The system has since been adopted by most of the larger lumber and pulp companies, and is also used by the Department of Lands and Forests, in their Crown Land Survey. There is no reason why surveyors in private practice could not use the same system. It has stood the test of time, with few changes. The first thing to do, when starting a new note book on retracement work, is to number the pages. Also number the book. Next, about four pages from the back of the book, place a column of figures in numerical order, starting with number one. These numbers are the ones that are allotted to the corners set. The next column is reserved for the page number, and as the survey progresses, the page in the field book covering the final notes for each corner is placed in this column. Thus as the survey is completed, you have in the back of each field book a complete index of all work done, and hours are saved in plotting the notes. You also

have a quick reference when looking up the notes on former surveys.

Retracement work is a battle against time. The cost is terrific, and progress sometimes painfully slow. Only those who have been through the mill can fully realize the daily problems that occur to cause delays. Many of these delays can be lessened by using your head along with your pencil when taking field notes. Here is one case, and there are many others. You are running a trial line from an old corner, and arrive at the shore of a lake, bank of a river, or edge of a wet bog. You are

ahead of the chainmen, and must triangulate. If your notes are made out as below, you are able to set your base flags, then read your bearings and go around or across the obstacle with no delay waiting for the chainmen or calculating the distance while the whole crew waits. (Your sketches and calculations should appear on the opposite page.) The chainmen begin at zero again at the North shore of the lake, and the calculation across can be made while the axemen are cutting the line B to D, thus your notes are in order, and no unnecessary delay at the point of the obstacle.

Page 6		Fri., May Doefield,	6th 1955 Doe County.	
		D .		to pine centre. rt. angle E'y 0.04
	6.10			
		B .		
	A .			by tri. across S. shore small lake
		20.21		
N. 11 15E	20.21			
0.00 Post	No. 9, Southeast	angle		
East line	John Doe Grant			
No. 12345	100 acres			

10
A (across lake) 10.00
B20.21 plus 10.10 30.31
D30.31 plus 6.10 36.41

LAND SURVEYOR'S EXAMINATION

This article has been written more in sorrow, at having to tackle an extra job, than in criticism of the Board of Examiners. Most of the readers will be aware that for the past three years a committee has been set up by the Surveyor General for the purpose of examining the possibility of standardizing the examinations for Land Surveyors throughout Canada. Mr. J. H. Holloway D. & A. L. S. of Edmonton, Alta. prepared a most able precis of the various syllabi for examinations in each province and for the Dominion Land Surveyors; Mr. Holloway has deserved the thanks of all surveyors for his contribution to cause the unification of standards in Canada — a truly laborious undertaking.

The writer was appointed, as representative of the Nova Scotia Land Surveyors Association, to the Surveyor Generals Committee. The perusal of Mr. Holloway's precis is rather an eyeopener and when one has occasion to study and write solutions to the Preliminary, Intermediate, and such of the Final Examinations of the Dominion and Ontario Land Surveyors as are relevant to Maritime condition one is sensible of a severe shock.

It is indeed lamentable that of the three oldest provinces in Canada only Quebec should have set a high standard for some time past. A second province, New Brunswick, cleaned house in 1954; their approach is worthy of our very close consideration and debate: it may be characterized as examinations set by the universities under scrutiny of the Executive Committee of the New Brunswick Association — educational authorities modified, if necessary, by professional practitioners. Given good will coupled with co-operation it would seem to have great promise.

Those of us who are in touch with the practical surveyors, but few of whom were university graduates, are only too painfully aware of the fact that the Nova Scotia examination has, of late years, degenerated into a speed writing contest. In this context the following is submitted for your consideration:

1. **Duration of Examination.** Nova Scotia 2 days. Minimum elsewhere 4 days plus field work in survey.
2. **Time allotted per papers.**

Nova Scotia	(a) Surveying	3 hours
	(b) Areas	3 hours
	(c) Maths	1½ hours
	(d) Astronomy	1½ hours
	(e) Instruments	1½ hours
	(f) Legal	1½ hours

Elsewhere, Minimum 3 hours.

3. Exemptions

Nova Scotia University graduates are exempted from writing all papers except the Legal.

Elsewhere, University graduates have to write a limited Final Examination.

4. Query

Can our standards be rated highly in Canada

- (a) When 1½ hours suffices to test our candidates Knowledge of (c) to (f) inclusive. part 2 above.
- (b) No field work is required in examination.
- (c) No problems on curves other than preparing field notes for one circular curve (chord method) and one vertical curve. Surely modern practice in highway and Town Planning design warrant a paper on this subject.

5. Instructions to Candidates.

Nova Scotia None.

Elsewhere Very detailed instructions on printed or mimeographed sheets. The vital one is "All steps in a solution must be shown, no marks will be awarded, however correct the solution. If any step be omitted."

Corollary Absence of instruction does not make for a high standard of work, nor does it tend towards the penalising of "cribbing". The candidate is left in doubt of the standard of computation required of him.

6. Time Element.

The writer in writing solutions to Nova Scotian, D. L. S. and Ontario Final papers in comparable subjects has found:—

Examination	Time per written page of Solution
Nova Scotia	Average 18 minutes
D.L.S.	Average 36 minutes
O.L.S.	Average 36 minutes

Without being final the above indicates fairly well that the Nova Scotia examination in the absence of any instructions to Candidate, require too much in the time allotted.

In conclusion the writer, Instructor of the Nova Scotia Land Survey School, has no desire to make adverse criticism of the Board of Examiners but his attendance at the Surveyor Generals Committee, as a result of appointment by the Executive of the Nova Scotia Land Surveyors Association, has opened his eyes to certain anomalies. From a selfish point

of view he has nothing to gain from stirring up a hornets nest; the record of success in the Nova Scotia examinations by graduates of the school has been rather on the gratifying side. However if your executive will appoint a dour scot you must expect a report which he believes to be necessary.

It would appear to the writer that the final responsibility for examination should rest with the Provincial Association as it does in every other province.

James A. H. Church
Instructor

Are you getting the most from your compass?

"High precision is expensive and should be used only where necessary," says S. E. Huey, Consulting Engineer, Monroe, La. "The most important exercise of professional judgment is in the selection of precision. Rural land, route and stadia surveys can be run with errors of from 1:000 to 1:2000.

"Modern American transits, like our Gurley's, are equipped with sensitive and accurate magnetic compasses which can be used for surveys of this order. Each compass needle has its individual declination from true north, but we standardize each transit by setting the compass declination circle permanently at zero.

"Then with transit on a magnetic station, and with both 'A' vernier and compass needle set carefully on zero, the angle between this setting on magnetic north and true north is turned and read on the 'A' vernier. Five or six separate settings and readings are made to east declination or maximum west declination would occur at this time. Our transits are standardized for 1.00 P. M., and declination and date noted on a sticker in the transit

box. Magnetic declination for the transit and stations can be quickly obtained from current editions of C. A. A. charts. On compass surveys, correction for position and time of day can be applied to the declination.

"Set the declination on the 'A' vernier and bring the compass needle to zero position. The transit is now oriented with the true north."

"When these corrections are made by an experienced 'Compass Man,' surveys with allowable error of 1:3000 can be made. No rear rodman is needed, and clearing for line is reduced to a minimum. Errors in lining in points are compensating rather than propogating, as for transit lines.

"Fear of local attraction is sometimes an excuse for lack of confidence in the magnetic compass. It can often be dispelled by getting rid of metal objects on or near the surveyor. But when it is impossible to eliminate this attraction or when magnetic storms cause erratic action, a survey can be continued by conventional transit line."

Is Polaris on Your Parties?

"Next time you're afraid that errors may be piling up along your line call on the north star to set you straight," suggests William E. Weigle, City Engineer of York, Pennsylvania. "Every surveyor knows the value of Polaris, but too few of us actually use it."

"A few years ago, we were hounded by taxpayers, trying to find their property's relation to the city boundary. The line was last run in 1888, and large areas had been annexed to York since that time. Confusion was mounting, so a precise survey seemed the only answer.

"We found only four stones surviving from the old survey, and had to start practically from scratch. The line proved to be 11.4 miles long with 77 changes of direction. Obstacles—natural and man-made—faced us all along the way so we feared that error might be creeping into the work. But,

by taking observations on Polaris, we saved ourselves considerable grief.

"Wanting to use the star at elongation—to take advantage of the 20 minutes when total changes in azimuth is only six seconds—we checked our Gurley Ephemeris; and made the first observation after midnight, in below-freezing weather. This result was carried to another point about two and one-half miles distant in longitude, where a second observation was made. Allowing for convergence of meridians, we found the bearings did not agree. Checking computations pinned down the error saved carrying it around the city.

"In all, we made five observations—the last, fortunately, on a much warmer evening in spring. Through these observations—and good instrument work—the survey was closed without any angular error."

SPRING EXECUTIVE MEETING

OF THE ASSOCIATION OF PROVINCIAL LAND SURVEYORS OF NOVA SCOTIA

March 28, 1955

1. The meeting was opened at 2:45 p.m. by President March at 310 Robie Street, Halifax, N. S. Those present were — President J. R. March, past-president R. E. Dickie, Major Church, Freeman Tupper, Donald Eldridge, Ronald Chisholm, Layton Reid, Sect'y Treasurer R. M. Schofield.
2. Moved by Freeman Tupper that the minutes of the last executive meeting be accepted. Seconded by Major Church. Carried.
3. Moved by Reg Dickie that the "Nova Scotia Surveyor" be used as a reminder that annual dues are payable. Seconded by Major Church. Carried.
4. Moved by Don Eldridge that the editor, R. E. Millard, write letters to Hughes — Owens Ltd., Keuffel & Esser, Charleston, Instruments Limited, and other companies soliciting their ads in the "Nova Scotian Surveyor". Seconded by Layton Reid. Motion carried.
Suggested the price be \$15.00 per year for ads, ten ads required to cover one page.
5. Freeman Tupper suggested putting law suit cases of interest in the "Nova Scotian Surveyor", possibly one each issue. The proposal met with much approval among those present.
6. President March read a letter from the Halifax County Planning Board requesting a meeting of representatives of the Association regarding information on sub-division plans. Tentative date of such meeting to be April 25, 1955. Mr. March suggested that Mr. James MacKenzie, Layton Reid and himself represent the Association at the meeting.
7. An interesting discussion regarding the merits of astronomic quadrant bearings on sub-division plans as against azimuths reckoned from the astronomic meridian.
8. President March brought up the subject reciprocity with the Association of New Brunswick Land Surveyors. He said that he had a letter from Mr. Roberts, President of the New Brunswick Land Surveyors Association, stating that he was in favour of reciprocity with the Nova Scotia Land Surveyors and would suggest a meeting to discuss the matter. Some discussion followed and it was suggested that Mr. Roberts come to Halifax to discuss the above.
9. Freeman Tupper stated that good progress has been made on permanent monuments being set by the Department of Highways on land taken over by the Department of Highways.
10. President March brought up the subject of persons practicing land surveying without being the holder of a Land Surveyor's Certificate. Don Eldridge suggested that such actions be mentioned in the "Nova Scotian Surveyor".
11. It was suggested that the secretary send official receipts for membership fees in the future.
12. Don Eldridge stated that the candidates for New Brunswick Provincial Land Surveyors are required to pass a photogramatic examination. It was suggested that such a procedure might be adopted for Nova Scotian land surveyor's examination. It was proposed to turn the matter over to the committee in charge of Nova Scotia land surveyor's examinations of which Professor Ball is the Chairman.
13. Don Eldridge brought up the subject of a minimum tariff for surveying. It was decided that the subject would require quite some discussion, and that the idea be mentioned in the August issue of the "Nova Scotian Land Surveyor."
14. Reg Dickie expressed the opinion that more action be taken regarding the canvassing for new members.
15. The Meeting adjourned at 5.15 p.m.

To Remind You That Dues for 1955 Are Now Due

NEW MEMBERS

SINCE FEBRUARY ISSUE OF "THE NOVA SCOTIAN SURVEYOR".

Charles H. Taggart, 255 Daniel Ave., Ottawa, Ont.
H. D. G. Currie, 1472 C. N. Express Bldg., 1 Simcoe St., Toronto, Ont.
Robert J. MacIntyre, P. O. Box 64, Antigonish, N. S.
Kenneth G. Thompson, 125 Queen St., Truro, N. S.
Curtis M. Boylan, New Ross, Lun., N. S.
J. E. Reid, 3 Westminster Ave., Amherst, N. S.
Allan F. Collings, 2427 Lockhart Ave., Montreal 16, P. Q.
Edmund S. Telfer, Caledonia, Queens Co., N. S.
V. C. Blackett, 97 McBeath Ave., Moncton, N. B.
Albert O. Riggs, Knob Lake, Quebec.
Stephen E. March, Bridgewater, N. S.

Douglas C. MacLean, 1 Heath St., Apt. 18, Toronto, Ontario.
Cyril B. Carlin, Hillsboro, Albert Co., N. B.
G. Emerson Bill, 105 George St., Ottawa, Ont.
Pierre LaPointe, 24 Charlotte St., Longueuil, Que.
Sterling G. Snow, Ecum Secum, Guys. Co., N. S.
A. T. Banks, P. O. Box 47, Kingston, N. S.
Alexander M. McDonald, P. O. Box 186, Mahone Bay, N. S.
Victor J. Gaudet, Room B369, No. 8 Temporary Bldg., Ottawa, Ontario.
Lionel E. Boutilier, Room 12, 469 Broadway Ave. Winnipeg, Man.
Victor J. Comeau, Room B369, 8 Temp. Bld., Ottawa

Let's Improve Land Survey Records

"Many current practices in and surveying are crude and outdated," says R. Getty Browning, Chief Locating Engineer, North Carolina Highway Commission. "Instrument work has become increasingly accurate through the years, but recording has not kept pace.

"Need for improvement is immediately apparent to anyone retracing a previous survey. Descriptions have often been so hastily and inefficiently written and markers so carelessly placed that it is almost impossible to follow the previous man's work.

"Here's how we can improve the quality and lasting value of our surveys:

1. Permanent monuments, referenced carefully, should always be established at the time of the survey.
2. All bearings should be referred to true North, and all measurements between monuments should be the horizontal distance.
3. Survey should be checked by latitude and departure methods and corrected to bring it within standards consistent with type of land being surveyed.

4. A map should be drawn from corrected field notes and filed with county surveyor.

5. An accurate description, fully describing various corners and reference points, should accompany the map.

6. A sheet showing computations should also be filed, together with a copy of the surveyor's report—telling for whom survey was made, when it was completed, what procedure was followed.

"For some time, many engineers have proposed a geometric coordinate system for the entire nation. Before we can benefit from such a plan, we must first properly delineate the small tracts which will fit into it.

"Standardizing on such a simple, practical plan would put an end to haphazard work; eliminate confusion; protect the landowner and the community; and increase the prestige of the profession.

"This problem has bothered me since 1902, when I assisted a Maryland surveyor whose specialty was unraveling complicated surveys. Progress can be made only with surveyors and engineers using their influence to bring about a change."

NOTICE: to all members of the Association

You are requested to send in materials for the Nova Scotian Surveyor to R. E. Millard P. L. S., Editor, Liverpool, N. S. Every item will be carefully read and considered.

How about writing any Provincial Land Surveyor you know and have them join up.

Magnetic Declination

A partial list of observations made during recent surveys, showing the Magnetic Declination as found, is given below. A complete list of all available observations is being compiled, and we hope to have it ready for an early issue.

County	Locality	Latitude and Longitude	Date	Declination West
Annapolis	Four Mile Road North of Maitland Bridge	44° 30' 00" 65° 15' 00"	Oct. 28th, 1954	22' 08"
Antigonish	Browns Mtn.	45° 38' 43" 62° 10' 19"	Aug. 5th, 1948	24' 57"
Antigonish	Maple Ridge	45° 42' 02" 62° 08' 00"	Oct. 5th, 1948	25' 15"
Antigonish	Highfield Road	45° 43' 14" 62° 04' 15"	Aug. 1st, 1949	25' 06"
Antigonish	Mayfield	45° 31' 06" 62° 07' 36"	Aug. 25th, 1950	24' 56"
Antigonish	Polsons Brook	45° 27' 40" 61° 54' 30"	Oct. 16th, 1951	24' 52"
Antigonish	Alder River Rd.	45° 28' 24" 61° 41' 36"	Sept. 16th, 1953	24' 57"
Antigonish	Lochside (School House)	45° 46' 18" 60° 38' 48"	Sept. 9th, 1953	24' 58"
Cape Breton	Salem Road, Cape Breton & Richmond County	45° 48' 02" 60° 35' 38"	Oct. 16th, 1953	25' 08"
Cape Breton	Eskasoni	46° 00' 08" 60° 35' 08"	Oct. 17th, 1952	25' 19"
Cape Breton	Eskasoni	45° 57' 24" 60° 35' 05"	Sept. 15th, 1952	25' 16"
Guysborough	Cameron's field, Melrose Road.	45° 16' 00" 61° 57' 00"	Sept. 29th, 1948	24' 21"
Guysborough	Sutherland's field, Guys. Rd.	44° 18' 34" 61° 51' 29"	Aug. 17th, 1948	24' 06"
Guysborough	Hurley Lake	61° 48' 00" 45° 20' 00"	Sept. 6th, 1948	24' 05"
Guysborough	New Harbour	45° 10' 48" 61° 27' 22"	Nov. 10th, 1951	24' 51"
Guysborough	New Harbour	45° 00' 06" 61° 57' 00"	Sept. 11th, 1951	24' 16"
Guysborough	Cooper Lake, (Wine Harbour)	45° 04' 10" 61° 52' 30"	Sept. 4th, 1951	24' 09"
Guysborough	Ogden	45° 20' 44" 61° 37' 41"	Aug. 19th, 1952	24' 20"
Guysborough	Denver	45° 19' 47" 62° 07' 06"	Dec. 2nd, 1950	24' 11"

Guysborough	Goose Harbour Lake, Middleton Road.	45° 29' 23" 61° 24' 51"	Sept. 23rd, 1954	24' 17"
Guysborough	Summer Lake	45° 36' 14" 61° 29' 30"	Aug. 13th, 1954	24' 38"
Guysborough	Clydes Lake (near Grosvenor)	45° 36' 24" 61° 28' 36"	June 26th, 1954	24' 38"
Halifax	Sheet Harbour		Feb. 23rd, 1952	23' 48"
Halifax	Waverley	44° 47' 00" 63° 36' 30"	Dec. 23rd, 1954	23' 15"
Lunenburg	Aldersville	44° 50' 00" 64° 30' 30"	June 30th, 1947	22' 12"
Lunenburg	Whale Lake Road	44° 35' 00" 64° 34' 00"	April 27th, 1947	22' 21"
Lunenburg	Ash Brook (near Colpton)	44° 27' 30" 64° 48' 45"	Sept. 6th, 1948	21' 55"
Lunenburg	(near Colpton)	44° 27' 25" 64° 56' 10"	Oct. 28th, 1948	22' 04"
Queens	Halfway Road	44° 27' 25" 64° 56' 10"	Nov. 2nd, 1948	21' 34"
Richmond	Loch Lomond	45° 39' 54" 60° 38' 18"	Oct. 16th, 1953	24' 58"
Richmond	Loch Lomond	45° 45' 22" 60° 37' 02"	Sept. 24th, 1953	24' 59"
Richmond	McNab's Cove	45° 44' 00" 60° 41' 37"	Aug. 9th, 1954	25' 13"
Shelburne	Beaver Dam, (Bowers Lake)	43° 39' 45" 65° 25' 00"	Jan. 28th, 1955	20' 57"
Victoria	Gairloch Rd.	46° 07' 56" 60° 57' 41"	Aug. 8th, 1951	25' 41"
Victoria	Mill Cove St. Annes	46° 14' 48" 60° 36' 13"	Oct. 24th, 1950	25' 59"
	Upper Baddeck River	46° 13' 40" 60° 41' 37"	Sept. 18th, 1950	24' 46"

SIMPLE RULE FOR CORRECTION OF BEARINGS

I wonder how many of our practising Land Surveyors, particularly those engaged in woods work, have used the 57.3° rule for the correction of bearings? It is simple, practical and easy to use. Simply multiply 57.3° by the offset or error and divided this by the distance travelled.

For example: I am called upon to run a line from a given point, and from my knowledge of previous surveys I have decided that the proper course should be N. 67° 50' E. I run a distance of thirty-two chains, sixty-seven links and find an old centre or other monument at a right angle distance of sixty-six links to the right, or on a course of S. 22° 10' E., this being the offset or error. I then

multiply 57.3° by .66 and divide by 32.67, resulting in a correction of 1.157° or 1 degree and 9 minutes. Therefore the correct bearing between these two points is N. 68° 59' E. If my starting point was correct and the line reasonably straight I should then follow it from here on. Otherwise, after proceeding on this corrected course, it may be necessary to make further corrections until satisfied that the thread of the line has been finally obtained.

I have invariably used this method of corrections on compass boundary line work and can assure you that it is not alone simple but practical as well. Try it yourself.

R. E. Dickie