

FRIDAY AFTERNOON SESSION

The last session of the annual meeting was opened by the president, Col. FitzGerald. He presented Mr. C. C. Lindsay, President-elect, Canadian Institute of Surveying, to the assembled members and guests.

Mr. Lindsay presented the following paper:

MR. C. C. LINDSAY: Mr. Chairman and Members of the American Society of Photogrammetry. I bring you Greetings from The Canadian Institute of Surveying and also a message of congratulations upon the splendid work which you have been doing and upon the very successful meeting which you are having.

It has been quite a thrill for me and my colleagues to listen to the various addresses which have been delivered to you by so many experts in their particular line of endeavour. It has been of great educational value and it is an honour to occupy the same rostrum.

It has been especially interesting to me as a surveyor in private practice to learn of the achievements which have been performed in the field of photogrammetry, because I, and others of my profession, are the ones who benefit most by your work.

We are the men who go on the ground and run the baselines and the meridians, who lay out the land for settlement, survey the mining claims, locate the transmission lines, the pipe-lines, the highways and railways, and also as Mr. Randall mentioned yesterday afternoon, spend long days retracing old and almost invisible survey lines to an intersection where we frequently find, by digging, the half-rotted wooden-post or the stone and delf boundary corner which definitely proves the worth of our deductions and ties our work into the older system of survey.

My first connection with photogrammetry was in 1928 when I was called upon to mark out upon the ground the limits of a number of riparian properties which were to be purchased as part of the area which would be flooded by a proposed new power development. Since it was necessary to work fast and get options upon the required acreages before speculators got wind of the enterprise, an aerial photograph survey was made by Brock and Weymouth, of that section of the river affected by the development. Levels were taken along the river for ground control and the elevations of certain well-defined points established. These were used for platting of contours upon the finished map prepared from the mosaic. From these contours the required area of each settler's lot was marked out upon the plan and the necessary options taken from this information.

Shortly afterwards, we marked out the areas to be taken in each lot prior to the passing of the Deeds of Sale, and for checking purposes we carried a line of levels through the lines. I am pleased to say that our contour map checked closely with that prepared from the air, and this notwithstanding that there was a heavy timber growth in the valley. In those days that was considered a remarkable achievement by us, though probably commonplace by Brock and Weymouth.

We surveyors in private practice find that aerial photography is the most valuable tool in our kit. In wooded country where traces of the old original survey are hard to find, in rural districts where many of the line fences are crooked and inaccurately placed, vertical aerial photographs are very valuable. They are great time and effort savers. Their chief asset however, lies in the fact that the view which they present enables one to pick out the most suitable starting points, the best direction lines and the routes to be followed, sometimes with startling accuracy. We use them whenever we can get them. It is standard

practice with us to cover a projected location by aerial photography, whether it be for a pipe-line, a transmission line, a highway or a railway, if the district has not already been mapped from the air.

We surveyors in Canada make use of the aeroplane a great deal, not only for exploration but greatly for the transportation of men and supplies into our great hinterland which until recently has been relatively unmapped. My former partner, Henri Bélanger, of Quebec City, was one of the pioneers in freighting by plane on this continent. Immediately after the first Great War, in company with the late Harry Quigley, just demobilized from the Royal Air Force, they organized a freight service from the St. Lawrence Valley into the region of Ungava, where Mr. Bélanger was tracing out the height of land around the headwaters of the Hamilton River. The map of that region was just a blank white space. Making use of several old planes they established caches of food and equipment for the use of the various survey parties on the job. For a basis of comparison of costs in money and effort, I wish to state that before planes were used for this work, all food and equipment had to be transported upstream from the St. Lawrence Valley, through an uncharted wilderness, by canoe. The river was rough in places, and where the canoes could not be paddled, they were poled, and when they could not be poled they were tracked by lines hauled by men following the banks or in shallow water. At the portages, some of which were four miles long, the canoe loads and the canoes had to be back-packed over to the smoother waters above. Travelling time was close to 45 days, the freighters consumed much of the provisions en route, and the final cost of the loads landed at the central cache was \$1.10 per pound plus cost of merchandise. At this rate a sack of flour cost close to \$120.00. The aeroplane transportation, crude as it was compared with modern methods, as the de-commissioned bombers were old, cut these costs in half, and saved nearly all of the man-power energy which was being used up before.

Aeroplane Transportation to us surveyors in Northern Canada, is no longer a luxury, it is a necessity. The flying is of the bush-pilot variety, mostly visual, with quite a bit of hedgehopping, where the skill and instinct of the pilot is a controlling factor. But all of this is old stuff to most of you, and I will not enlarge upon it, except to say that flying under these circumstances with the possibility of running into fog, snow flurries, or a blizzard, is still a bit of an adventure.

For example, my friend and companion on this visit with you, Mr. Côté, Director of Surveys for Quebec Province, could supposedly give me instructions to run a base-line or a meridian in Northern Quebec, say for 75 or 100 miles. Probably the work would be done in winter. All he can give me is my starting point and some information of the country behind me, what lies ahead is in the blue, and unknown except for surmise.

I then arrange with a commercial firm to fly my crew, dogs, tents, provisions and equipment into the region concerned, early in January and to establish caches at selected points along the route of the projected line.

If the flat expanse of paper on the map has deluded me into believing that the country is flat and that everything will be easy going the first glance that I have of it from the air rapidly disillusion me. It is pretty sure to be rolling country, possibly mountainous, cut up into a maze of lakes and rivers which all run every which way.

After spotting the caches and getting the crews into their first camp, I take advantage of the plane's last trip to make a reconnaissance forward. Just a few miles short of where we estimate the end of the line to be, we pick out a fairly

large lake where the pilot is going to come back and pick us up about the end of March. As we go through the motions of marking this rendez-vous on his map and on mine, I am making a silent wish that nothing is going to happen to him in the meantime, that he is not going to crash, or get sick, or promoted, or suffer some other casualty until he gets us out of there.

And he on his side is hoping that we don't suffer undue delays through bad weather, or bad terrain, or unexpected accidents or other calamities which will prevent us keeping the rendez-vous and make him lose valuable flying-time looking for us. In this state of mutual alertness he takes his leave and we are left to our own devices. I should add that in every case, these rendez-vous have been satisfactorily kept and that the services rendered by the commercial flyers have been above par.

Private practice in Canada covers three main features. Firstly, mapping for geographical purposes using ground methods and establishing markers at identified points for reference purposes. Secondly, the laying out of land for settlement, or running land-lines for settlers or other land owners in the country districts. Thirdly, what is known as Town or City Surveying. Each one of these branches is almost a specialty in itself. I wish to remind you here that the bulk of our population is centered in the watershed of the St. Lawrence River and along the two transcontinental railways in Western Canada, while the remainder of our vast Dominion is as yet relatively undeveloped.

The first two features follow more or less the same standard practices in use in both Canada and the United States, with due regard to local laws and environment. The third, however, Town or City Surveying, is a subject all by itself; it requires considerable practice before one can be considered as even moderately skilled in its exercise. This is all the more true in the Province of Quebec, where there is a dual system of measurement due to the fact that both the French and the English unit of measurement are legal, and the Civil Law is the law of France. The Criminal Law of course is the British Criminal Code, and I assure you that it is an education to anyone to visit one of our criminal Courts in Quebec and hear a French speaking judge, jury and advocates pleading or administering justice under this British Code and in the French language. It is a great example of how well the descendants of two great nations can get along together when there is mutual understanding, respect and goodwill between them.

During the French Régime numerous tracts of land were conceded, principally along the St. Lawrence River, to scions of noble families in France as Seigneuries. These were all laid out in French Measure and many transactions in the rural part of the Province are still in French Measure, the arpent, the perche and the Paris Foot and Inch; though most properties in urban areas now give the dimensions in English Feet and Inches or Tenths. It is necessary to mention in every Deed of Sale that English Measure is used if that be the case, because when no standard of measure is mentioned the law presumes that French Measure was intended. There is quite a difference between the two; for example one arpent is 180 feet, French Measure, and 180 feet French Measure is equal to 191.8 feet English Measure. Some unfortunates have learned the difference to their cost.

I do not want to enlarge upon the Seigneurial System as it is quite a subject by itself. I do want to say, however, that there have been many misconceptions current about the rights, etc. of the Seigneur. As it existed in Canada, while it brought certain onerous duties and obligations upon the tenants, it also involved considerable responsibility and a number of onerous duties upon the Seigneur

as well. The latter was not only obliged to colonise his Seigneurie, to build the roads, and the flour-mills and saw-mills for his tenants or censitaires, he was also obliged to render fealty, homage, military service and rents to his Seigneur if he was the holder of a fief or to his liege if he was absolute Seigneur. For the opening up of a new country, the system was patriarchal in effect, and worked well on the whole. The Seigneurs, with very few exceptions, were respectable, hardworking men, who took their responsibilities seriously and did much to build up the country. In time, of course, it became obsolete, and there are few relics of it left. A number of Seigneurs still exist, but their holdings in most cases consist of little more than their Manor Farms or timberland which have not been conceded or sold.

In our cities, towns and villages we have the mitoyen or common wall. You have it also, I notice, but we have certain laws in this connection which are interesting. Under our Law any proprietor may take up to nine inches of his neighbour's land for the purpose of building a wall. He must take an equal width upon his own side of the boundary so that the wall shall be exactly astride the latter. When the wall has been built it is known as a wall-to-become-common. But until the neighbour has acquired title by purchase to a half or common interest in the wall, he may not make use of it in any way even though it is partly built upon his land. He may not use it for the curtain wall of a shed, nor lean a trellis against it, nor train vines upon it. He can acquire a half-interest in it at any time by paying half of its cost. When he has done so, it becomes a common or mitoyen wall, and mitoyenneté is a saleable commodity for good and valuable consideration.

If a proprietor builds a wall on his boundary-line but not over it the neighbour can make use of the wall thus built although it was not intended to be common by paying half of its value and half the value of the land upon which it stands.

Another Article of the Civil Code deals with the illegal opening or view. One cannot have any openings in any wall which are situated at a distance less than six feet, French Measure, from the boundary line upon that side, if the view from these openings is a direct view, i.e. perpendicular to the boundary-line. These openings are only permitted if the window casing therein is fitted with opaque or translucent glass, also with an iron trellis of not less than four inches of square, and the windows sealed with plaster or nailed in. Moreover they must be nine feet from the floor upon the first floor and seven feet from the floor on upper floors. If the view from these windows is indirect as in the case of windows in a wall perpendicular to the boundary-line, the distance must be two feet, French Measure therefrom. Any of us who have had to do with municipal building regulations which permit of houses being built within a few feet of one another upon neighbouring lots, with windows of the one opening almost into the windows of the other, will appreciate the value of this restriction. The legislators of the Napoleonic era who passed these edicts were not so solicitous about the amount of air space between the houses as they were for the fact that the current method of disposal of garbage, etc., was to dump it out of the window, preferably upon the neighbouring land.

If a property-owner wants his boundary-line established he summons his neighbour to a settlement of the boundary or to a bornage as it is called. This is always done through a surveyor. If a boundary between two properties is in dispute or has become indistinct, it must be re-established. Usually the surveyor is called in to mark out the line as a routine matter, but when he notes conflicting occupation on the ground he advises the owner that he had better have a

settlement of boundary. If everything is clear sailing and the parties are friendly, the surveyor establishes the line to the best of his knowledge and experience after consulting the official plans and the Deeds of the parties. He then prepares an agreement, called a *procès-verbal* of bornage, in which he details the plans and documents which he has studied, the steps which he has taken in his survey and the method followed, the bondaries which he has planted, etc. This is signed by both parties with him and in his presence, and is usually registered in the local land titles office. The original remains of record in his office.

In the event of a disagreement between the parties it is necessary to be more formal, and even submit the matter to the Court for decision.

The Court, upon request of the parties will appoint an expert surveyor or surveyors, to make a survey of the premises, prepare a plan showing the rival pretensions of the contestants, examine the Deeds to the respective properties and present a report of the findings to the Judge who will then pass judgment fixing the position of the line. The expert surveyor is then instructed to return upon the ground and mark out the line in accordance with the judgment and prepare a *procès-verbal* of his operations and deposit it with the Court records of the case.

The riparian boundary of property fronting upon navigable rivers or streams is ordinary high water mark. This must not be confused with average high water mark which is a different thing. The beds of all navigable rivers, streams and lakes belong to the Crown. The beds of non-navigable rivers, and lakes belong to the neighbouring proprietors, the dividing-line being the middle of the stream, or water-course.

Increase of land due to deposit of silt becomes the property of the riparian owner in the case of navigable rivers, conversely also, scouring may diminish his holdings. His riparian boundary is therefore subject to fluctuation, from year to year. Our shore-lines are fairly static on the whole and there are few changes from this source.

If one occupies a piece of land openly, uninterruptedly, without equivocation and as proprietor for thirty years he has fulfilled all the requirements of prescription and as such is entitled to possession. He can have this confirmed by judgment of the Courts. From this it follows that if a wall, or fence, or hedge, or other mark of division has been accepted by neighbouring proprietors as their mutual dividing line for over thirty years then this wall or fence, etc., is their boundary-line and must be accepted as such whether correctly located or not unless both proprietors agree to abandon claims to prescription of this occupation-line and go back to the theoretical location of their line. Since the law assumes good faith upon the part of the occupant it is necessary for the aggrieved party to prove the contrary. The law is therefore in favour of the squatter or trespasser; it therefore behoves the absentee landlord to exercise frequent supervision over his holdings, or else he may suffer loss.

Squatters' rights do not prevail against the Crown, therefore the only rights which a squatter upon Crown lands may have would be the right to fyle upon the piece of land occupied as and when this particular region is thrown open for settlement.

In the allotted time at my disposal I have been able to cover only a few of the many legal points encountered in the course of everyday practice. You will have judged therefrom that the surveyor in private practice must not only have a certain mathematical and technical background but must also have a good knowledge of the laws governing the ownership and use of property, and the drafting of Deeds, Leases and other Agreements. While the lawyer and the

notary prepare the paper work necessary for a property transaction and make sure that the titles are in perfect order or otherwise, it is the surveyor who connects the descriptions in the Deeds with the actual physical location of the lot, so as to ensure that the property described on paper is the actual property existing upon the ground. Thus the peaceful occupation of the land by the owner depends a great deal upon the accuracy with which the lot has been marked out and this is the responsibility of the surveyor because he is the link between the document and the ground.

Gentlemen, it has been a great pleasure to address you today. I thank you for inviting me to come, also for your kind hospitality which my colleagues and myself have enjoyed very much.

Col. FitzGerald expressed the thanks of our Society to Mr. Lindsay. He commended the spirit of good will and cooperation which made it possible for Mr. Lindsay, Mr. Côté, Mr. Chipman, Mr. Siddall, Lt. Col. Andrews, Mr. Jackson and other Canadian members to attend the annual Meeting.

Col. FitzGerald then presented his paper on "German Photogrammetry in the War."

COL. FITZGERALD: In order to forestall almost certain, and probably justified, criticism that the following brief remarks do not cover fully the story of German photogrammetry in the war, I should like to state now, and with considerable emphasis, that no extensive research has been undertaken to amplify or verify the rather sketchy reports obtained personally from German technicians, both military and civilian, at the Hansa-Luftbild at the Templehoff in Berlin and various mapping organizations in or near Munich, during the past summer. In other words, to make a hard story soft, "While we do not guarantee this information, it was derived from sources we believe to be reliable."

Since I was principally concerned with the mapping operations of the German Air Forces, I did not attempt to obtain information regarding other military mapping operations which, if they were carried on at all by Germany during the war, were probably of minor importance.

Prior to 1934, a considerable number of private firms existed in Germany which engaged in aerial photography and photogrammetry. Many of these were small and specialized in vertical and oblique photography for industrial publicity. The larger and more important photogrammetric organizations were the Hansa-Luftbild GMBH in Berlin; Photogrammetrie GMBH in Munich; Aerokartographisches Institut in Breslau; and the Bildflug GMBH Bonn. These organizations were established following World War I and cooperated closely with scientists and inventors, as well as instrument manufacturers, in promoting the further development of photogrammetry. Practical experiments were encouraged and carried on, both in aerial photography and photogrammetry, and the results were subject to tests by precision methods, generally under the supervision of Government authorities. It is claimed that this cooperative experimental work resulted in a progressive reduction of costs, as well as a continual improvement in quality, especially in aerial photogrammetry.

Early in 1934, all existing private aerial photographic organizations in Germany, with their personnel and equipment, were combined to form the Deutsches Einheitsluftbildinstitut of the Hansa-Luftbild GMBH, with its main office in Berlin, and branch offices in Munich, Bonn, Munster and Breslau. The Breslau office was closed in 1936 and its personnel and equipment distributed among the other three offices. The Berlin office was assigned to work middle and eastern Germany; Bonn or Munster, northwestern Germany; and