ALBERT PELLEW SALTER'S EXPLORATION, BASE, MERIDIAN AND RANGE LINES SURVEY 1856 – 1858

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BACKGROUND

The colony of Quebec, under British rule following the Seven Years' War, was divided into the Provinces of Upper and Lower Canada pursuant to the initial directions set out by the 24 August 1791 Order of King George III, with the advice of his Privy Council. The proposed division was carried into effect by the enactment of Imperial Act, 31 George III, c. 31, now known as the *Constitution Act, 1791*, which repealed certain portions of the *Quebec Act, 1774* and provided a new constitution for the government, organization, and administration of the two new provinces.

Subsequently, by Imperial Statute 3-4 Victoria, c. 35: *An Act to re-unite the Provinces of Upper and Lower Canada, and for the Government of Canada,* enacted on 23 July 1840 and proclaimed on 10 February 1841, also known as the *Act of Union*, the two Provinces were re-united to become the Province of Canada. However, the two former geographic entities continued to be governed and administered separately as Canada West and Canada East sections of the province according to the Upper and Lower Canada divisions, including formal and informal, and interchangeable, use of the four names. More specifically, the Crown Lands Department for the Province of Canada continued to administer Provincial lands as either Canada West/Upper Canada, or Canada East/Lower Canada, lands.

At the time of the enactment of the *Act of Union* the boundaries of Upper Canada included the territory southerly and westerly of the Ottawa River, northerly of the international boundary with the American colonies established by the Treaty of Paris of 1783, and southerly and easterly of the lands granted to the Hudson's Bay Company, ("HBC"), also known as Rupert's Land, the boundary being the height of land separating the Arctic and Great Lakes watersheds. All of Upper Canada

> … fell within the Indian Territory as defined by the Royal Proclamation of 7 October, 1763, which decreed that the lands therein were reserved "for the Use of the … Indians as their Hunting Grounds." (Surtees 1986: 1)

During the 1840s copper deposits in the upper Michigan peninsula were discovered and successfully developed; followed by the 1846 opening of the province's first commercially successful copper mine at Bruce Mines. Those events fuelled a drive for mineral exploration along the northern shores of lakes Superior and Huron, resulting in surveys and Crown grants of twenty-two large tracts of land along the north shore of Lake Huron specifically for mining purposes. Over the summer and fall of 1847 and 1848 extensive geological exploration and mapping surveys were primarily completed by Assistant Provincial Geologist, ("APG"), Alexander Murray as well as by Provincial Geologist William Logan along the north shore of Lake Huron for the newly formed Geological Survey of Canada. Those exploration surveys

included the main shores and islands of that lake, from the St. Marys River easterly to the French River and Lake Nipissing, and well inland along the principal rivers and their tributaries and lakes draining to the south, to assess the geology and mineral potential for the district.[1] The principal rivers, Thessalon, Mississagi, Spanish, and French, and the westerly end of Lake Nipissing were surveyed and mapped to facilitate the location of geological examination and exploration, relative to the locations and sinuosities of those water bodies and courses:

> The measurements on all the surveys were chiefly as effected as in former years by the use of the micrometer telescope, and our bearings determined by prismatic compass; and by means of an excellent spirit level, the elevation of Lake Nipissing and various other points of importance, over the bed of Lake Huron, were ascertained.[2]

Those exploration, surveying, and mining activities often resulted in conflicts with the locations of some villages, hunting, and fishing sites of the Ojibwe inhabitants of those lands with whom no treaties had been negotiated as was required by the British policy codified in the Royal Proclamation of 7 October 1763 (Marlatt 2004:281-283).

Subsequently, in response to the complaints and representations made by the Ojibwe inhabitants, and following two fact-finding Crown commissions, William Benjamin Robinson, MPP, was appointed by the Executive Council for the Province to negotiate treaties with the Ojibwe First Nations inhabitants of the northerly portions of the upper Great Lakes watersheds. Treaty 60, dated 7 September 1850, more commonly known as the Robinson-Superior Treaty and Treaty 61, dated 9 September 1850, known as the Robinson-Huron Treaty, were signed to share the lands with the Crown. In addition to the provisions for the payment of annuities, reserve locations for each of the signatory First Nations were *excepted* from the ceded lands.

As an initial step of the process to organize the ceded territory to raise funds for the payment of the treaty annuities, Provincial authorities recognized the need to know what lands were available for development or settlement, in addition to the surveyed Mining Locations. It was necessary to survey and demarcate the reserve boundaries, which had only been described in general terms by the treaties.

As summarized by (Marlatt 2004:287-288):

> By the time of the signing of the treaties, the mining activities that had precipitated the treaty settlements had greatly diminished. Very few of the mining locations had actually yielded any great wealth. However, with the signing of the treaties the settlement at Sault Ste. Marie was in a position to expand and diversify, and applications to acquire timber rights along the shore of lakes Superior and Huron had been received by the Crown Lands Department. Also, at that time, very little was known about the land and resources beyond the exploration of the immediate shorelines.

The Crown engaged Provincial Land Surveyor, ("PLS"), John Stoughton Dennis, and subsequently others, to demarcate the boundaries of the reserve lands that the signatory First Nations wished to retain, and to explore and report on the nature of both the reserves and the adjacent lands. Specifically with regard to the Robinson-Huron Treaty reserves, from 9

September through 17 November 1851, and from 16 July through 7 November 1852, PLS Dennis and his attending parties completed the field work for the reserves along the shores of Lake Huron, and the French River, with the final plans and returns including a partial survey of the reserve at Lake Nipissing, and no surveys or exploration at all for the inland reserve locations on White Fish Lake and Lake Wahnapitae. By letter dated 21 May 1853, PLS Dennis transmitted his returns for the 1852 season to the Crown Lands Department. (Marlatt 2004: 295-315)

Further geological examination of the region was completed by APG Murray in 1854 and 1855, including the survey and mapping of the Magnetawan River, and the main channels of the French River draining Lake Nipissing to Lake Huron, and a complete exploration and mapping of Lake Nipissing. Murray, again, used the micrometer telescope for measuring distances, prismatic compass for measuring bearings, and a theodolite for trigonometric levelling to determine elevations above Lake Huron. Further: "… meridian altitudes of the sun and moon were frequently taken to correct our latitudinal positions."[3]

By March of 1853, several of the mining companies associated with the Mining Locations that had been surveyed and granted along the shores of lakes Huron and Superior had been dispossessed of their lands by the Crown after going into arrears on their dues because their mining activities had not been as productive as had been anticipated. The Crown agreed to dues deferral terms for the reinstatement of their tenure and possession if the requirements were met by 1 November 1853, and that the remaining arrears be paid, with interest, by 1 May 1855.[4]

In 1855 the several mining companies and others interested in Mining Locations on the upper lakes petitioned for further relief from their overdue installments and further delay in payment of their dues, "… in consideration of the difficulties with which they have had to contend" in realizing a return on their mining activities. Upon the recognition that: "… it is well known that loss & disappointment have been incurred by the proprietors of Mining Locations arising from various causes …", the Executive Council of the Province, by order-in-council dated 9 June 1855, granted either some further relief, or an alternative solution: to consider the Locations as lapsed, and available for offer at public auction. The Council also agreed with the Commissioner of Crown Lands' suggestion to:

> … dispatch during the course of the present year a competent person to ascertain the actual progress made upon the Locations, to which the above recommendations will apply, in developing the Metallic & Mineral resources of the Province & to inquire into & report upon other matters connected therewith, detailed at length in his Report.[5]

Pursuant to that order-in-council, instructions dated 12 June 1855 were issued by Commissioner of Crown Lands Joseph Cauchon to Count Édouard-Sylvestre de Rottermund, formerly with the Geological Survey of the Province and now an Inspector of Mines with the Crown Lands Department, to examine the progress made in working the various existing upper lakes Mining Locations and to report on the mineralogical indications for those portions of the province. De Rottermund was directed to contact PLS Albert Pellew Salter of Chatham, who was familiar with the area that de Rottermund would be examining and who could provide valuable assistance in organization and preparations for his expedition.[6]

By instructions dated 18 June 1855 from Commissioner Cauchon to PLS Salter under the authority of the same 1855 order-in-council, presumably pursuant to the inquiry and report on "… matters connected therewith", PLS Salter was directed, (in addition to initially provide assistance to de Rottermund in the organization and preparations for his examination of the mining works and mineral potential of the area), to undertake a separate examination of the lands lying to the north of Lake Huron, from the St. Marys River at Sault Ste. Marie easterly to the French River and Lake Nipissing, for lands suitable for settlement:

> The object contemplated, is the discovery of lands adapted for settlement, and it may be well to state, that assertions have from time to time been made, by persons who have traversed portions of the country adjacent to Lake Huron, that within a moderate distance of its shores, but not generally extending down to them, lands of good quality exist.[7]

SALTER'S 1855 EXPLORATION OF THE NORTH SHORE OF LAKE HURON AND INLAND

Salter was instructed to refrain from operating within the limits of the First Nation Reserves and the Mining Locations, for which he was provided with copies of the related survey plans, although he could take note of any pertinent information of interest about those lands. It was suggested that he ascend the principal rivers and streams entering the lake, and any other inland streams and lakes that feed them, as necessary to discover the extent and soil quality of any tracts suitable for farming, as would justify their survey into townships. Copies of maps showing the principal rivers Thessalon, Mississagi, Spanish, and French, as had been recently traversed by APG Murray were also provided to him,[8] as well as tracings of Bayfield's hydrographic survey charts of the Lake Huron coast and islands.[9]

Pursuant to their respective instructions, de Rottermund contacted PLS Salter, and together they travelled to the village of Sault Ste. Marie, arriving 5 July. Salter engaged a party of seven men and transportation for Mr. de Rottermund and, as Salter's party had not yet arrived, all hands completed an exploratation of the lands up to 15 miles inland from the village and westerly to the Root River and its tributaries. Upon arriving at the mouth of that river and meeting up with Salter's own party of ten men[10] on 12 July, PLS Salter accompanied Mr. de Rottermund and his party to the Bruce Mines; leaving him to pursue his own project while Mr. Salter returned to Garden River and inland exploration until returning to the Bruce Mines on 20 July where he received instructions sent from the Commissioner of Crown Lands directing that the parties separate. Mr. de Rottermund set out for his geological explorations and attendances at the Mining Locations on Lake Superior, and until 3 November 1855, PLS Salter continued his explorations. He ascended and examined the areas up the Thessalon, Mississagi, Blind, Serpent, Spanish and French Rivers flowing into Lake Huron as well their upper tributaries and headwater lakes. He also examined the shore of the St. Marys River and Lake Huron as well as the west end of Lake Nipissing and the westerly rivers flowing southerly into its north side; the Sturgeon, Cache, and Beuve, now known as Veuve, rivers.[11]

Salter and his exploring party relied upon the main river locations surveyed by APG Murray, and mapped the lesser significant rivers, tributaries, and inland lakes by continuous tracking of their routes from the moving canoe using a mounted boat compass to indicate the bearings travelled while measuring the distances ranged by timing the passage of the canoe

past the known distance of a line attached to a log occasionally placed in the water from the front of the canoe. For the overland exploration across watersheds, a combination of either chaining or pacing and timing, along recorded compass bearings from known points was used to relate the observations, with checks to the surveyed points left by APG Murray's work and with position checks by sextant and chronometer observations.[12]

PLS Salter confirmed earlier observations that from 2 to 5 miles inland from the shores of the St. Marys River, Lake Huron, French River, and the westerly end of Lake Nipissing the nature of the land changed dramatically from the coastal lands which he described as:

> … at times, bold, rugged, and declivitous, and scantily clothed with stunted spruce, balsam, pine, and birch, …[with] … slender hopes of finding much land fit for agricultural purposes; at others, rising gently from the margin of the water, and covered with a fair growth of hard wood timber, birch, maple, and iron-wood … whilst here and there, extensive tracts of level land are seen, in some places low and swampy, presenting an almost impenetrable thicket of black alder and sallow; in others, open prairie, covered with a luxuriant growth of wild grass.[13]

The topography of the explored lands beyond those shore lands was described as:

> … consisting of rich alluvial valleys, varying in width from a quarter to seven miles, heavily timbered with mixed timber; crossed at intervals by rock ridges, and traversed by small rivulets of excellent water. …[14]

PLS Salter, in his final report of his explorations, dated 26 January 1856,[15] provided details on his findings for each of the rivers and watersheds he examined. In addition, he filed a plan to illustrate the extent of his explorations and observations,[16] and a diary providing a detailed account of his daily work.[17] *(See Figure 1)*. His report summarized his findings, overall, under three categories: as an agricultural country, as a timber and mineral producing region, and as regards the region's fisheries:

> As an agricultural country, … good arable land … large and extensive tracts are found with deep alluvial soil, furnishing material for the formation of, I consider, at least sixty fine townships of thirty-six square miles area each, capable of producing to perfection, rye, oats, barley, maize, grass and all kinds of root crops.
> …
>
> As a timber region, many extensive tracts of pine, of a very fine quality were seen, both red and white, and this valuable timber is scattered to a greater or lesser extent throughout the whole country, and further the birch, tamarac, cedar and spruce, of which timber there is no lack, all serve to enhance its value as a lumber country.
> …
>
> Of the mineral resources of the country, as I am not a professional Geologist, it would be presumption in me to speak, … but I may be permitted to say, that, in the most sterile sections, indications of mineral were constantly met

> which would lead me to hope that, at some future period, these portions will serve to increase the revenue of the country.
> …
>
> The Fisheries, though of minor import to the subjects above treated of, I feel it my duty to touch upon, as they at present furnish the principal staple product of the country, many hundred barrels of white fish and trout being yearly exported from the several Fishing stations on the Lake.[18]

He also acknowledged the "magnificent water-power" potential of the rivers capable of supporting both timber and mining activities.

PLS Salter also recommended, if it was decided to survey and subdivide the explored country for settlement, that the method of survey should accord with the six-mile square system of township survey as had been adopted by the United States.[19]

In a statement to the Legislative Assembly by Commissioner Joseph Cauchon, dated 13 March 1856, a general summary of the known information relating to the recently explored lands was provided, as follows:

> Of that portion of Upper Canada which lies between lakes Superior, Huron, and Nipissing, the French and Mattawan Rivers, and the Hudson's Bay Company Territory, but little is known. As the position of the highlands which bound it to the north, has not been determined; the extent of the tract cannot be given with accuracy, but may be taken as 60,000 square miles, or 38,400,000 acres. The Indian Reserves cover an area of about 590,086 acres, and about 352,175 acres have been surveyed into Mining Tracts, leaving about 371/2 millions of acres unappropriated. The shores of the lakes are generally rocky, broken and sterile, but recent explorations have developed large tracts of fertile land behind the rocky hills. These explorations will be resumed next summer.[20]

Prior to Commissioner Cauchon's statement, by instructions dated 15 February 1856 from Commissioner Cauchon to PLS Salter, under the continuing authority of the 9 June 1855 order-in-council and further to the instructions to Salter dated 18 June 1855, PLS Salter was directed "… to proceed to Lake Nipissing, … and draw an exploring line from the mouth of Sturgeon River westerly to Batcheewauaung Bay on Lake Superior …," and such lateral offset lines as necessary to determine the extent of arable land lying behind the rocky hills on the north shore of Lake Huron. More specifically, PLS Salter was provided by the instructions with termination point latitude and longitude on Batchewana Bay, as derived from Bayfield's chart of Lake Superior, and was directed to determine the latitude and longitude of the mouth of the Sturgeon River where it emptied into the north side of Lake Nipissing, then determine the astronomic bearing of the line to be run, estimated to have a bearing of N 80º W. Regarding the lateral exploration lines, Salter was instructed to engage "… in addition to the usual surveying party … two assistants … to make the necessary lateral explorations." They were not to measure their lines, merely to estimate their distance travelled by the time spent walking over the ground. General instructions were enclosed that specified, primarily:

- Bearings of surveyed lines were to be verified by astronomical observations, noting the magnetic variation[21] at the observation points;
- Clear surveyed lines well and blaze the adjacent trees;
- take a back observation at each instrument station;
- the lengths of the chains were to be verified before and throughout the survey, and the chain-bearers were to be honest and capable to ensure accuracy of measurements and marking of posts. Horizontal distances were to be determined;
- the theodolite was to be kept in adjustment and examined often;
- locate and report any suitable sites for town-plots;
- surveyed lines are only to be run by "a duly admitted Provincial Land Surveyor";
- prepare a plan of the survey and exploration lines at a scale of 80 chains to an inch, illustrating the natural features of the country, on thin linen or cotton;
- maintain a diary in the required form summarizing the details of the work completed;
- maintain a field-book in the required format, summarizing the details of the measurements and observations of magnetic variation from astronomical determinations, topography and general nature of the country traversed, the nature and abundance of the soil and timber, water courses and water-powers, and record the details relating to posting of the lines run; and
- prepare a report of survey containing "… a concise summary of your proceedings, with a few general observations on the Physical Geography of the country, its capabilities and the best mode of developing them."[22]

The proposed project would traverse lands located further north than those explored by PLS Salter's 1855 work, thereby expanding the Crown Lands Department's knowledge of the nature and characteristics of the new land-base.

Following an exchange of letters from 24 March to 17 May 1856, between PLS Salter and the Crown Lands Department,[23] advance monies for the project were provided, and James Johnston, PLS, also of Chatham, was approved by the Department and instructed to accompany and assist Mr. Salter on the survey.[24]

On 19 May 1856,[25] PLS Salter wrote to Commissioner Cauchon and proposed amendments to the nature of the exploration line survey he had been instructed to undertake. As outlined earlier, in his 26 January 1856 final report on the 1855 exploration, Salter had recommended that any township survey for the district should use the six-mile square system of township survey adopted by the United States, which he described, as follows:

> The principal recommendation of this system is, I think, its simplicity, and to that portion of our country under consideration, I consider it peculiarly applicable.
>
> In commencing the survey of a new tract, two principal lines are run from such points as may be deemed the most convenient, the one called "The Principal Meridian" is due North and South, and the other at right angles to it, or East and West, called "The Base Line."
>
> Correction lines, parallel to the base, are run at the end of every ten townships, and form bases for all townships north of them. This is done to correct the error which would arise from the convergence of meridians. All these lines are run

> astronomically, and careful observations are taken at the end of every mile, or oftener if necessary, to detect or prevent error.
>
> Upon the principal meridian, at the end of every mile section corners are established, and at every sixth mile a township corner. From these corners on the base line, range lines are run parallel to the principal meridian, on which section and quarter section corners are established, and at the end of the sixth mile a temporary post is set, but at the end of the sixth mile on the most Easterly range line of the tract to be surveyed, a township corner is established. From this corner a line is run due West to intersect the temporary posts set on the range lines, whether it be at the temporary posts or not, the several townships are established.
>
> Each township is then divided into thirty-six sections, each containing six hundred and forty acres, which are again subdivided into quarter sections, or one hundred and sixty acres. Any further subdivision required, is made at the expense of the purchaser or proprietor.
>
> …
>
> I would further respectfully suggest that only such townships as are found to contain a large proportion of arable land should be subdivided, but that the outlines of all should be run and the corners marked by cairns of stone or other durable monument.[26]

With the intention to complete his survey to accommodate the subsequent implementation of the recommended township survey system, PLS Salter suggested revision of the proposed survey by running a base line due west from the Sturgeon River, to be posted every six miles for future township corners, with a series of lateral offset lines run due north to also be posted every six miles for the sides of future townships. By letter dated 29 May 1856, Commissioner Cauchon revised PLS Salter's instructions for the survey:

> I have to acknowledge the receipt of your letter of the 19th instant submitting an amendment to the manner of tracing the exploring line from Lake Nipissing to Lake Superior by drawing lines due west with rectangular offsets due north which may be afterwards available in the subdivision of the territory into townships, and to authorize you to survey accordingly. The meridional offsets must be only twelve miles i.e. the depth of two townships.[27]

Those instructions comprised the initial step by the Crown Lands Department for the introduction of the American system of township survey into Upper Canada and initiated the earliest survey of base and meridian lines as a preliminary stage for exploration to facilitate the subsequent surveys of such townships, and as a method to, more definitively and accurately, explore and inventory the land and resources of the Upper Canada lands to the north of Lake Huron.

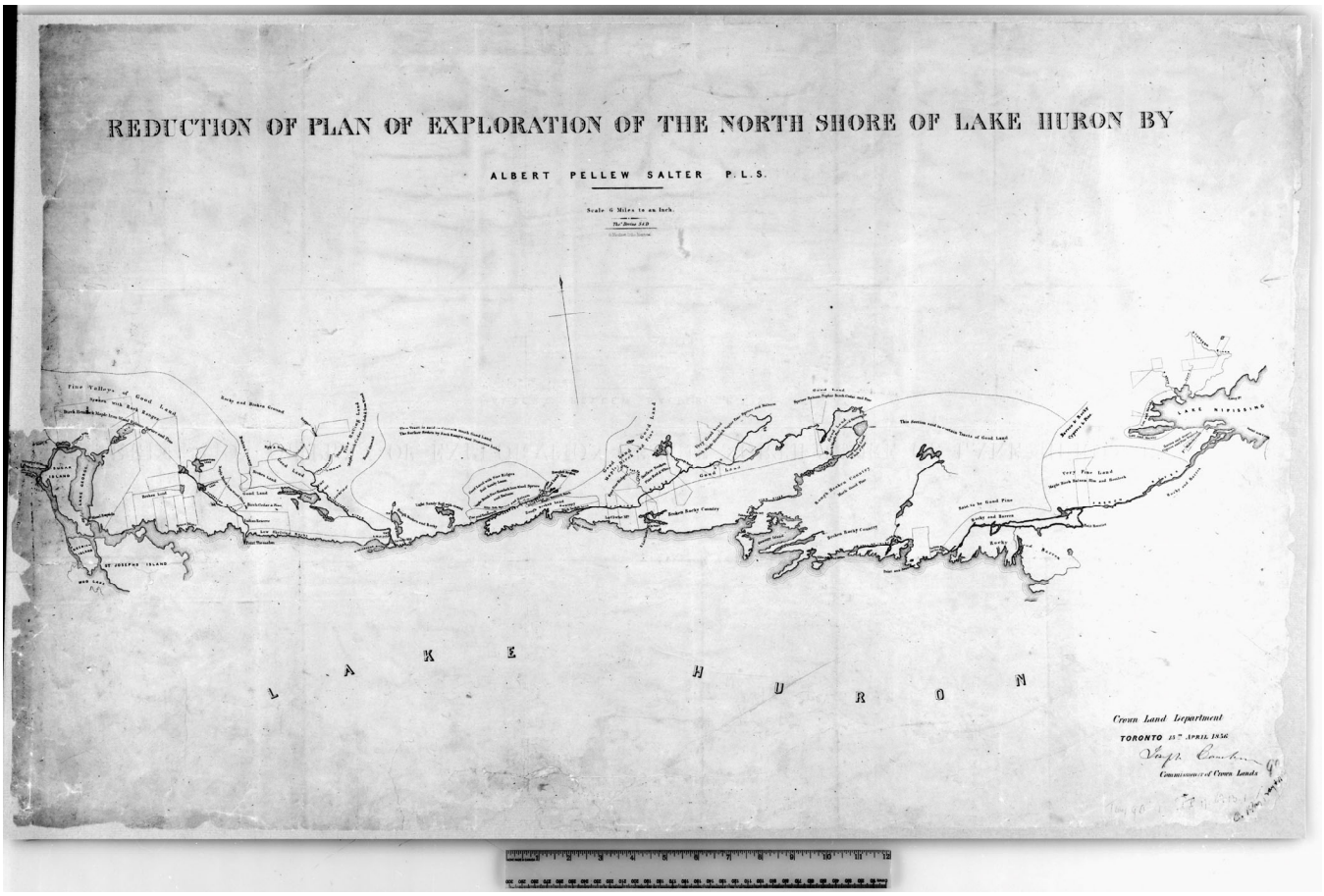

Figure 1: Reduced-scale copy of A.P. Salter's 1855 Plan of Exploration of the North Shore of Lake Huron, prepared by Crown Lands Department, 15 April 1857. Source: LAC, Maps, plans, and charts, V2/410/Huron/1857.

SALTER'S EXPLORATION, BASE AND MERIDIAN LINES SURVEY OF 1856 – 1857
FIRST SEASON

In early June of 1856, PLS Salter began procuring supplies for the season, while PLS Johnston was preparing sketches of the known topography of the north shore of Lake Huron through which they would need to travel to bring provisions to the survey work. Salter and Johnston then travelled to Toronto with Arthur Jones, PLS,[28] engaged to make lateral explorations from the surveyed line. Several days were spent there acquiring and forwarding further supplies to Penetanguishene. They travelled to Penetanguishene on 10 June where Salter had arranged to hire men and canoes for the project and a boat to transport their supplies. The whole party departed Penetanguishene, reaching the French River on 16 June, where the supplies were unloaded. The boat and some men were sent back to Penetanguishene for the balance of the supplies which were to be transported to Waddell's Mill on Collins Inlet of Lake Huron, where Salter arranged to meet it on 1 July.

Salter and the balance of his party ascended the French River to Lake Nipissing, then crossed the lake and ascended the Sturgeon River to the location above the HBC post and south of the first rapids where they were to commence the base line survey. A four inch diameter

cedar post "… planted near the North and West banks, of "Sturgeon River" … Lake Nipissing …"[29] marked the point of commencement for the survey[30].

Several days were spent organizing the parties, checking and adjusting the theodolites, and regulating the watches. PLS Johnston assisted PLS Salter in completing astronomic observations for the determination of the latitude and regulation of his watches by measurement of the altitude of the sun at noon on 25 June, and by the measurement of the altitude of Polaris at 10:30:47 pm on the same day; with determinations of 46º 22' 03" N and 46º 22' 00" N[31], respectively. Observation of Polaris at the subsequent 12:45 am elongation was also made to provide the bearing for running the base line astronomically west, and for initial determination of the magnetic variation.

By coincidence, APG Murray, having been assigned in the summer of 1856 to geologically explore further regions to the north of Lake Huron, was also commencing his work on the Sturgeon River of Lake Nipissing, intending to work further north, then westerly. An accident with the only steam ship available to transport Mr. Murray and his assistant with their season's supplies posed a serious delay to his field work. However, he fortuitously crossed paths with PLS Salter and was transported with Salter's party to where Murray had arranged to meet his own party of assistants for the season at Shebahonahning, now known as Killarney. Murray was also provided with copies of the sketches that had been prepared by PLS Johnston, which he found of value to his explorations. Murray likely provided Salter with his determinations for the observed latitude and the longitude "by account" for the HBC post on the Sturgeon River,[32] and a set of observations of the moon, from which Salter intended to determine the longitude of the mouth of the Sturgeon River.[33]

From 25 June through 1 July, PLS Salter and his whole party were engaged in running the line astronomically west from the point of commencement:

> … noting at intervals the variation of the magnet, and planting a post of cedar at the end of six miles, with the distance from the post at the point of commencement marked thereon, and this system, I would here remark, was adopted throughout the survey, cairns of stone, where practicable, being piled round them, and the bearings and distances of trees taken.[34]

The field notes also indicated the recording of required topographical information as to the nature and shape of the ground covered, the suitability of the soil for agriculture, the type of vegetation and tree cover observed, the water courses and lakes intersected by the line, and the triangulation information for indirect determination of distances across water that could not be directly measured, as referenced to the continuous recording of miles and chains from the point of commencement.

On 2 July, where the line intersected the Veuve River, PLS Salter left PLS Johnston to continue the base line with explorer Jones, two chain-bearers, and eight axe and packmen. Because the base line was running through unexplored lands further north than those that had previously been explored, transporting food and provisions to the surveying party as it moved steadily west was a major concern, there being uncertainty about the water transportation routes that would intersect the line. Salter with two canoes of supplies, travelled down the Veuve to

Lake Nipissing, then to the north-westerly point of the lake and ranged inland to cache the supplies at the intended latitude, approximately 6 miles west of the Veuve River. He then returned to Lake Nipissing, down the French River to Lake Huron, and westerly to Waddell's Mill, arriving 6 July, where his boat waited with the second load of supplies from Penetanguishene. He took astronomic observations to determine the latitude of that location, then explored inland along the lakes and rivers of what he called the Mahzenazing River as far inland as he could, then ranged on foot for approximately 12 miles to the latitude of the base line to set a second cache of supplies on 18 July.

Returning to Waddell's Mill and taking on more supplies that had been left for him at Killarney, PLS Salter ascended the White Fish River, reaching Round Lake on 28 July. Selecting a location from which to run the first or principal meridian line, PLS Salter took astronomic observations for latitude and azimuth and ran an astronomic north line for 13 miles and 5 chains, to latitude 46º 32' 27" N; being Salter's calculation for the distance of twelve miles or two townships north of the initial base line being run from the Sturgeon River along the parallel of latitude 46º 22' 00" N. That post would be the point of commencement for the second base line to be run west. He completed the principal meridian work on 25 August and returned south to White Fish Lake on the 26th.

While surveying the meridian line, astronomic observations for azimuth were made on eight days, sometimes on Polaris, sometimes on the sun, and sometimes both were observed on the same day, and once, the sun was observed two separate times in one day. Further, a second determination for latitude was made one hundred and thirty chains south of the northern end.

In addition, while running the meridian line north, between the fifth and eighth miles, Salter recorded significant local attraction of the compass with readings varying by as much as ten degrees, also noting: "… the existence of iron was plainly discernible in the rock."[35] As stated earlier, APG Murray was also engaged in geological exploration of the same area, with his travels often crossing the base line. At some point, Mr. Murray was informed of the local attraction noted by PLS Salter and he carefully investigated both along and to the east and west of the meridian line, noting the presence of iron ore, iron pyrites, and small quantities of nickel and copper.[36]

Because Mr. Johnston and the base line party had not yet arrived at White Fish Lake, where it was determined the initial base line would intersect the principal meridian, Mr. Salter explored the country to the east of the lake for three days. He then travelled west to the Spanish River where the last of his provisions had been taken by the boat, then returned with them to White Fish Lake, now accompanied by a full party, arriving 3 September. Concerned that PLS Johnston had "… met with some accident", Salter and his party ran a "… loose line" easterly from the meridian line for 11 miles, carrying provisions with them. Still not meeting Mr. Johnston's party, PLS Salter returned with his party to White Fish Lake, where he learned that Mr. Johnston had run short of supplies. Salter dispatched three of his party to return to Waddell's Mill and retrace the inland route to the second cache of supplies in hope of meeting up with the Johnston party; while Salter and the remainder of his party set out with a guide to travel easterly through a chain of lakes and watersheds towards Lake Nipissing. On 12 September Salter met

PLS Jones who was being guided westerly through the same chain of lakes in search of PLS Salter's party. Together, they travelled easterly, arriving at Mr. Johnston's camp at the Wahnapitae River on the 13th.[37]

Following the 2 July departure of PLS Salter from the base line, PLS Johnston continued to survey the line forward for almost 9 miles, missing the first provisions cache, which was located by PLS Jones on 10 July. The provisions were subsequently found and packed to the line, and work continued from 15 July to 16 August for another 15 miles to Lake Kepepawasing, now known as Lake Nepewassi. Concluding that his supplies would not take him to the expected location of the second cache and being short of manpower because three men had deserted on 5 August and one man was seriously ill, PLS Johnston and his party walked back the thirty-three miles to the HBC Post on the Sturgeon River. There, he acquired more provisions and hired a guide and two canoes. Leaving the HBC post on 23 August, they travelled across the lake to a watercourse that connected to Lake Nepewassi, where the line had ended, arriving on 26 August.[38]

The following day, PLS Jones and two men travelled back to Lake Nipissing and returned the borrowed canoes to the HBC post. Mr. Jones then acquired and repaired an old canoe and departed the post on 29 August, returning to the line by the Veuve River, exploring and mapping the river and adjacent lands as they travelled. As noted above, the base line intersected the Veuve River seven miles from the Sturgeon River. An exploration of the country to eight miles north of the base line had been performed earlier by PLS Jones and one man from 28 July to 30 July, which also intersected the Veuve River approximately six miles to the north of the base line; therefore, the new exploration work expanded the understanding for the Veuve River watershed area of the country. Eventually, as Mr. Jones' guide had predicted, the Veuve River and tributaries led to Nepewassi Lake, and Jones' party arrived back at Mr. Johnston's camp on 5 September.

From 26 August to 13 September, PLS Johnston and his diminished party advanced the line a further 8 miles to the Wahnapitae River at Mile 42 from the Sturgeon River. At Elbow Lake, approximately at Mile 39, Mr. Jones was deployed with his canoe and guide on 10 September to explore and map that lake, then to make his way westerly toward White Fish Lake to either meet PLS Salter, or to procure supplies at the HBC post located on the lake. Jones explored the lands adjoining the lake for four miles northerly, then returned to the camp and picked up two men and most of the camp supplies and explored Elbow Lake southerly, then travelled westerly to the Wahnapitae River, depositing some of the supplies, and one man, where he anticipated Mr. Johnston's work would intersect it; thereby minimizing the requirement for Johnston's diminished party to spend time moving supplies instead of advancing the base line.

Under the direction of his Indigenous guide, PLS Jones then travelled up the Wahnapitae River to a small creek, then westerly up the creek and over a series of portages and four small lakes. On 12 September Jones met PLS Salter and his party who were being guided easterly through the same chain of lakes in search of the base line party. Together, they travelled easterly, arriving at Mr. Johnston's camp at the Wahnapitae River on the 13th. As it would be throughout the project, no laborious work such as advancing the survey, moving camp, or

travelling was performed on Sundays. Typically, as on Sunday, 14 September, cleaning and adjusting the theodolite and taking astronomic observations were the extent of work completed.[39]

Salter resumed charge of the survey and, now with extra hands, from 15 September the base line was advanced, and the camp was moved daily to keep up with the work. The line was run west to reach White Fish Lake on 26 September where a post was set in the edge of the lake at 58 miles, 57.22 chains from the point of commencement at the Sturgeon River. As anticipated, the base line intersected the principal meridian line within the waters of White Fish Lake. A double set of triangulation ties to the post set on the north bank of the bay of White Fish Lake along the previously established principal meridian line were completed, to determine the point of intersection for the two lines to be 59 miles, 1.42 chains from the point of commencement.

In all, along the first base line, observations of Polaris at eastern elongation on twelve occasions, and of the sun on three occasions were made for bearing control and magnetic variance determination purposes. It is apparent from the field notes that a series of tangents were run due west from each point of observation, intended to approximate the line of the parallel of latitude 46º 22' N, rather than a systematic layout of chords to the parallel. Astronomic observations for latitude consistency were made at the beginning of the initial base line and at the westerly end in conjunction with layout of the principal meridian line.[40]

On 27 September, the instruments were, again, cleaned and adjusted and the following day the two chain-bearers and three packmen from Mr. Johnston's party were discharged.

On the 29th, PLS Johnston with men and supplies travelled to the northern post on the principal meridian to commence running the second base line, while PLS Salter and men advanced supplies by canoe ahead to Vermillion Lake, returning to Mr. Johnston's camp on 1 October. After advancing the second base line for 4 miles, Johnston was, again, left in charge of the survey, with PLS Jones engaged as chain-bearer for the rest of the season. PLS Salter and three men with two canoes explored the Vermillion River both north and south of the base line as well as Vermillion Lake, then advanced further west to the Spanish River, exploring it for several miles beyond the most northerly point left by APG Murray. On 8 October, Salter's party were able to assist PLS Johnston's party across the Vermillion River and a small lake while also providing supplies.

Because of excessive rain in September and October the Spanish River was quite swollen and the survey progress was slow. On 20 October Salter's canoes were abandoned and his party walked north to the base line and reached Mr. Johnston's camp on the 24th, just west of the Spanish River, 32 miles west of the principal meridian. While running the second base line to that point, PLS Johnston observed Polaris for bearing control of the work, and determination of the magnetic variance, on thirteen days. The total surveyed from the point of commencement was 103 miles.

PLS Salter decided to close the field work for the season at that point, and the party and baggage were sent down the Spanish River on a raft, while PLSs Salter and Johnston picked

up the canoes and travelled down the river to where the supply boat waited at the first rapids north of Lake Huron, on the 28th.

The canoes were stored there for the following season and the party travelled to the HBC post at La Cloche on Lake Huron, arriving on the 30th. Leaving Killarney on 1 November, and after being held up by storms for five days, the party arrived in Penetanguishene on 9 November, where the employed men were discharged, and Salter, Jones, and Johnston travelled to Chatham, arriving 15 November.[41]

PLS Salter was engaged in preparing, rendering, and paying accounts associated with the project, including travels to Toronto to meet with Commissioner Cauchon and Crown Lands Department accounting people from 17 November to 1 December. From 2 December 1856 through 20 January 1857, PLS Salter summarized:

> … I was employed in examining Field notes, Diaries, etc., and in the preparation of Plan, report and accounts assisted by Mr. Johnston; making the total number of days I was employed on this service for and during the season of 1856, 233 days.[42]

On 22 January 1857, PLS Salter transmitted his final accounts, a Plan, and his 20 January report to the Commissioner of Crown Lands of the base line and exploration survey completed in 1856, with accompanying reports from PLS Johnston and PLS Jones, as written to Mr. Salter.[43] The reports to PLS Salter outlined the general proceedings for the survey and the exploration observations completed by Mr. Johnstone and Mr. Jones when not working directly with PLS Salter.

PLS Salter's report summarized his activities over the course of the field season for the survey, exploration, and supply efforts to the survey party, followed by a general overview to describe the nature and characteristics of the county traversed and explored, relating to the "… physical geography … its capabilities, and the best mode of developing them", as instructed. Overall, he summarized:

> The topographical features, of the section of the country surveyed and examined this season, are very similar to those described in my report of last year, being composed of valleys of good land, varying in width, crossed by ridges of rock.
>
> In the valleys, the soil as before described was of good character being either a fine sandy loam, or a deep deposit of decomposed vegetable matter, with a subsoil of white or blue clay. The ridges varying in height from 40 to 150 feet, were at times clothed with a fine growth of pine and poplar, mixed with birch, maple and hemlock, at others covered with a stunted growth of pine, cypress and red oak, or entirely destitute of vegetation.[44]

Referring to the miles surveyed along the base and meridian lines, more specific references to the topography, soils, tree cover, and suitability for cultivation were summarized, and specific reference to the significant magnetic variation and mineral observations between the fifth and eighth miles along the principal meridian line were provided. A summary was also provided on the characteristics of the lands adjacent to explored lakes and rivers, with the advantages for transportation between Lake Nipissing to White Fish Lake they provided, and

the extent of the Vermillion River and Vermillion Lake, (where extensive Indigenous gardens were noted), and their connection to the Spanish River and the Lake Huron coast were reported.

Overall, PLS Salter, with respect to the resources of the country recently explored, stated he could only repeat what he had reported after his 1855 explorations: that there were extensive tracts of land fit for settlement and extensive forests of valuable timber. He also noted that the climate of the region was favourable to good health; and noted that "… it requires but the energy of man to render what is now a vast wilderness a comfortable home for the Emigrant."[45]

The report continued, providing his thoughts with respect to the potential development of the resources of the explored area, noting the greatest difficulty being its remoteness from the inhabited and cultivated portions of the province, and the difficulty of "… communication …" with the interior where the fertile lands are located:

> To lay down a general rule for the construction of means of communication in a country so varied by hill and valley, and so interspersed with lakes is a difficult task, particularly when, as yet, so little is known of it; but I am of opinion that by opening up one or more highways, navigable or otherwise, from the shore of Lake Huron, to such a distance into the interior as may be deemed advisable, and from certain points on these main arteries constructing roads Eastward and Westward, as a means of ingress and egress for settlers, the chief difficulty will, for the present be overcome.[46]

PLS Salter recommended, as an initial step toward that end:

> … from such points on the present surveyed base line, as may be deemed necessary for a thorough exploration of the country, Meridian lines should be produces Northward for 30 miles and Southward to the shore of Lake Huron; the country lying between them being carefully examined by explorers attached to the surveying parties for that purpose. I would advise that these Meridian lines should not be more than 18 miles apart, for two reasons – First, that by this means the country can be thoroughly examined and secondly, in case of need, the chiefs of the parties can readily communicate with one another, which, at times, in this uninhabited region is absolutely necessary as well for the safety of the party as for the advancement of the service.[47]

Salter's report closed by acknowledging the assistance of the officers of the HBC posts who provided supplies, Indigenous guides, canoes, and valuable information on inland routes and geography; and expressed his appreciation of PLSs Jones and Johnston, and his chain-bearers for their co-operation and diligence in "… forwarding the service".[48]

In his Report of the Commissioner of Crown Lands for 1856 to the Governor General of British North America, in the section relating to Crown Lands in Upper Canada, in the Huron and Superior Territory, and more specifically relating to the lands in the region lying north of Lake Huron, Commissioner Cauchon summarized the findings of Provincial Geologist Logan, and others, making reference to the valleys of fertile soil lying to the north of the immediate lake shore, and made reference to the 1855 explorations of PLS Salter of the inland between Sault

Ste. Marie and Lake Nipissing and his map and report published in the JLA for 1856. Referring to Salter's 1856 base and meridian line survey and exploration, Cauchon summarized:

> Mr. Salter having reported the discovery of a large extent of country well adapted for settlement, he was directed to draw a base line from Lake Nipissing to Lake Superior on which to project townships. In the beginning of last summer he proceeded on the service and produced the line as far west as Spanish River, a distance of ninety miles.[49]

Commissioner Cauchon provided a summary of the findings according to Salter's attached report, and outlined the further work that PLS Salter was to be directed to complete in 1857:

> On the opening of navigation, he will proceed to continue the base line westward to Lake Superior, and surveyors will be sent to draw meridian lines from his base line, at distances of eighteen miles apart, extending southerly to Lake Huron, and northerly eighteen miles. By these lines the agricultural and lumbering capabilities of the country will be ascertained, and they will also form the lateral boundaries of townships which it is proposed to have surveyed in the American system.[50]

By letter dated 21 April 1857, PLS Salter recommended that P.S. Donnelly, PLS of Moore, T.N. Molesworth, PLS of Goderich, and T.W. Herrick, PLS of Toronto be approved by the Crown Lands Department to assist him in the survey and exploration of the country north of Lake Huron by surveying and exploring meridian or range lines to the north and south of Salter's base lines.[51] By letters dated 29 April PLSs Donnelly, Molesworth, and Herrick were instructed by Commissioner Cauchon to communicate with PLS Salter and to put themselves under his orders, in accordance with enclosed General Instructions, to assist him in the survey and exploration of the country north of Lake Huron.[52]

SALTER'S EXPLORATION, BASE, MERIDIAN, AND RANGE LINES SURVEY OF 1857 – 1858
SECOND SEASON

A.P. Salter, PLS and James Johnston, PLS

On 15 May 1857, PLSs Salter and Johnston began preparations for the second season's field work. They spent five and eight days, respectively, preparing sketches and maps to guide and assist themselves, the other three PLSs, and their parties to navigate the country, delegate the work, and detail the assignments. PLSs Donnelly, Herrick, and Molesworth had contacted PLS Salter for directions, and by letters dated 23 May instructions and assignments were sent to PLSs Herrick and Molesworth. PLS Donnelly would travel to Chatham to personally accompany Salter and Johnston to Lake Huron.

Mr. Salter had travelled to London on 21 May to arrange for a theodolite, returning to Chatham the following day. Upon the completion of their preparations, Salter and Johnston travelled to Toronto on 28 May where they caught up with PLS Donnelly and some of his party who had travelled to Chatham to meet with Mr. Salter before travelling to Toronto on the 27th. Salter, Johnston, and Donnelly were delayed several days in Toronto awaiting the arrival of

instruments to be used on the survey. They had sent part of their parties forward to Penetanguishene to arrange the supplies and transportation until the arrival of Mr. Salter, *et al* on 1 June. The supplies and hired men were then sent ahead by boat with PLS Johnston on 2 June; with Salter and Donnelly departing the following day. After several stormy days and slow progress, all arrived at the mouth of the Spanish River on 9 June. The combined parties ascended the river to a portage leading to Bark Lake, now known as Birch Lake, which they crossed, then continued to travel on foot, packing the supplies and canoes, in a north-easterly direction, at one point taking an observation to determine their latitude. Eventually they struck the Spanish River again and continued northerly until meeting the base line on 20 June, where field work had ceased the year before. Salter and Johnston completed a latitude determination on Sunday, the 21st by measuring the altitude of the sun at two separate times, as a check on the work.[53]

Johnston and his party commenced running the second base line west from the previous season's work, while Salter and his party descended the Spanish River to bring the supplies forward and complete further exploration of the country. PLS Donnelly and his party followed Johnston's party until the setting of the base line post at Mile 36 west of the principal meridian; where their field work was to commence.

Salter descended the Spanish River to retrieve supplies and to direct the boat westerly to the Serpent River. Carrying supplies, Salter ascended the Aux Sables River, a tributary of the Spanish, exploring and mapping it until reaching the latitude of the base line where he made a cache of provisions for Johnston's party on 30 June, which Johnston reached on 2 July, at 46 miles west of the principal meridian. During Salter's subsequent descent of the Aux Sables his canoe was destroyed in some rapids, and he was obliged to walk to the Lake Huron coast, then travelled to the HBC post at La Cloche to secure another canoe while the remainder of his party waited at the mouth of the Spanish River. On 4 July, Salter returned to his party, and they travelled to the Serpent River to await the boat bringing more supplies.

After acquiring further supplies from the boat, Salter ascended, track mapped, and explored the Serpent River to Whisky Lake, then packed in supplies overland to near the latitude of the base line on 11 July with PLS Salter tracking their location by occasional observations of the meridian altitude of the sun. He, then, sent his party back down the Serpent River to move to the Mississagi River with a new load of supplies from the boat, while he, accompanied by an Indigenous guide and one other man, travelled north and west to intersect the base line, arriving at Johnston's camp on 14 July, where PLS Johnston had reached 59 miles west of the principal meridian.

Johnston continued the base line survey to 63 miles, then spent 17 and 18 July packing the provisions from Salter's recent cache to the base line and his camp. Salter had arrived at Johnston's camp with a sick man, and departed the following day, leaving him behind with Johnston's party and striking out overland westerly with an Indigenous guide to the Mississagi River which they reached on 18 July. The following day, having met his supply party, they ascended the river to the base line latitude and left a provision cache for Johnston's party on 19 July, then returned to Lake Huron. The following day Salter sent part of his party to assist Johnston's party on the base line survey, and Salter travelled to the HBC post at La Cloche and

arranged for a party to travel and retrieve the sick man. While awaiting the retrieval party's return, PLS Salter spent three days at the HBC post preparing sketches and letters of further instruction for his assistants and for the range line parties under PLSs Donnelly, Herrick and Molesworth.

On 25 July, the canoes having arrived with the sick man, Salter set out in the boat for Penetanguishene, which he reached on 28 July. The following day he travelled to Toronto, where he spent four days preparing an interim report on the project proceedings and acquired some supplies. On 3 August he returned to Penetanguishene where he acquired further supplies and once the boat was loaded, the party rowed it to the mouth of the Penetanguishene Harbour and camped on 5 August. Because of a series of intense storms and headwinds, progress was slow; three times being confined to their overnight camp locations for whole days. It was not until 19 August that Salter with his boat load of fresh provisions and supplies arrived at the HBC post on the Mississagi River, where he met up with PLS Johnston.

Following PLS Salter's 15 July departure from the base line camp, PLS Johnston and his party advanced the line westerly to Mile 93, at which point it became necessary to suspend the work to retrieve the supply cache at the Mississagi River, which he reached on 17 August. The following day Johnston descended the Mississagi River, arriving at the HBC post on 19 August where he met PLS Salter arriving in the boat with provisions from Penetanguishene.

The following day Salter and Johnston ascended the Mississagi River, arriving at the base line camp on 22 August. On the following day, a Sunday, PLS Johnston cleaned and adjusted the theodolites and observed the sun for azimuth of the forward line, while Salter travelled easterly to the post at Mile 90 to leave letters and instructions for PLS Donnelly.

From 24 August Salter and Johnston advanced the base line west, intersecting with PLS Donnelly's party on 26 August, travelling east from the Mississagi River towards the Mile 90 post. With the extra hands, the camp was also moved westerly most surveying days to keep up with the work. The line was advanced without interruption to Mile 126 west of the principal meridian, arriving on 11 September, when it became necessary to retreat to the Mississagi River crossing at 109 miles to await the arrival of fresh supplies, which were then packed to the work location.

In all, as with the first base line, for the second base line, observations of Polaris on thirty-eight occasions and of the sun on twenty occasions were made for bearing control and magnetic variance determination purposes. Also, it is apparent from the field notes that a series of tangents were run due west from each point of observation, intended to approximate the line of the parallel of latitude 46º 32' 27" N, rather than a systematic layout of chords to the parallel. However, for the second base line astronomic observations for latitude consistency were made at several locations along the line by measuring the altitude of the sun as it crossed the meridian at each observation location, as follows:

Distance West of Principal Meridian	Observed Latitude
50 miles 30 chains	46° 32' 32" N
80 miles 70 chains	46° 32' 35" N
109 miles	46° 32' 20" N

115 miles 40 chains	46° 32’ 21” N

It is interesting to note that the average of the four determinations is the intended or expected latitude of 46° 32’ 27” N.

From the Mile 126 post, a range line was to run for current exploration and future township sidelines parallel to the principal meridian by applying a correction for convergence of the meridian through the 126 Mile post as determined by the displacement westerly from the principal meridian, which had been run astronomically north from that point. Hence, by PLS Salter’s calculations, the range line northerly from the 126 Mile post was to be run astronomically N 1° 47’ W, and southerly from the post was to be run astronomically S 1° 47’ E as referred to the meridian through that point.[54] The range line north also avoided crossing the First Nation Reserve, No. 14 (Garden River) to the Robinson-Huron Treaty which lay in the westerly route of the second base line.

After observations on the sun and on Polaris for azimuth of the range lines, on 14 September PLS Salter commenced running the range line southerly to Lake Huron, while Johnston’s party continued to pack their provisions to the 126 Mile base line post. Salter surveyed 15 miles and 78 chains to Lake Huron, where he set a six inch diameter post in a large cairn of stones. While running the line, he observed Polaris twice and the sun seven times for bearing control and determined the latitude of the Lake Huron post on 25 September as 46° 18’ 25” N by measurement of the upper limb of the sun as it crossed the meridian. PLS Salter also noted crossing a blazed survey line at 11 miles, 18.35 chains which he concluded was the rear boundary of the Cuthbertson Mining Location,[55] within which the Bruce Mines are located.

Upon completion of the line PLS Salter walked to the Bruce Mines, then travelled to Sault Ste. Marie to obtain supplies, and to prepare and send an interim progress report on the project to the Commissioner of Crown Lands.

On 29 September, Salter and his party travelled to Garden River and ascended the river with supplies, making occasional observations of the sun for latitude. On 5 October Salter struck out overland with supplies, and with his packmen following with more provisions. The following day his party intersected with PLS Johnston’s third base line at the 6 Mile post, then travelled westerly to catch up with the base line party. On 7 October, Salter’s party met Johnston’s party travelling easterly along the base line on their way to Garden River to obtain more supplies.

After Salter’s party departed to survey the range line southerly from the second base line post at Mile 126, on 15 September, Johnston commenced to run the range line northerly from the same post on the intended bearing of N1° 47’ W for 12 miles, or two townships, which he reached on 23 September. On the way he observed the azimuth of the sun on three occasions and of Polaris on two occasions for bearing control of the line. On the same day he commenced running the third base line astronomically west from that 12 Mile range line post at latitude 46° 42’ 53” N.

After completing 20 miles of the third base line, PLS Johnston’s party was running out of supplies. On 6 October the party set out to walk easterly on the base line with the intention to

descend Garden River for supplies. On 7 October, Johnston's party met Salter's party travelling westerly along the third base line packing in fresh supplies for both their own and Johnston's party.

Both parties travelled westerly, with Salter and Johnston in advance, to the 18 Mile post; being 144 miles west of the principal meridian. On 8 October they completed an observation for latitude by measuring the upper limb of the sun as it crossed the meridian through the post, with the observed latitude of 46° 42' 58" N, as compared to the intended 46° 42' 53" N. The following day the supplies arrived and Johnston and his party, with their supplies, continued west to where the third base line had stopped. On 10 October, PLS Salter's party commenced running a range line southerly from the post on a bearing of S 2° 03' E to be parallel with the principal meridian, for exploration and future township sideline delineation. Salter noted that the range line crossed the surveyed rear boundary of Reserve No. 14 (Garden River)[56] at 4 miles and 27 chains south of the third base line, which meant that the southerly portion of the range line ran through the reserve. However, the range line was posted at 6 miles and continued southerly to a post planted at 11 miles and 1.95 chains in the edge of a marsh along the St. Marys River, near the mouth of the Root River, on 15 October. Two observations of the sun and one on Polaris were completed for bearing control of the line, and for determination of the magnetic variation.

From there, Salter and his party travelled to Sault Ste. Marie where the supply boat was located, then on toward Batchewana Bay on Lake Superior; however, storms forced him to shelter in Goulais Bay on 17 October. The following day Salter left the boat at Goulais River and walked north to within six miles of PLS Johnston's camp, arriving in camp on 19 October at 4 pm.

After separating from Salter's party at the 18 Mile post on the third base line on 9 October, Johnston and his party returned to where they had left the base line work and continued running the base line to Mile 24, setting that post on 13 October. It is not apparent if Mr. Johnston was aware that he had crossed into, and continued to run through, First Nation Reserve No. 15 (Batchewana)[57] to the Robinson-Huron Treaty. To that point, for the third base line, PLS Johnston completed eight observations of Polaris and four observations of the sun for azimuth bearing control and determination of the magnetic variation; while projecting astronomically due west lines forward from each observation.

From the Mile 24 post, being also 150 miles from the principal meridian, Johnston ran a range line northerly for 6 miles, or one township, on a bearing of N 2° 07' W to be parallel to the principal meridian. He was only able to observe Polaris on one occasion for bearing control, completing the line on 15 October. On the same day, he turned to survey the fourth base line astronomically west from that post for 9 miles and 6.14 chains at the latitude of 46° 48' 06" N, where he set a cedar post with a cairn of stones around it near the shore of Lake Superior on 19 October, in the face of a snow storm and high winds off Lake Superior; the same day that Mr. Salter reached his camp overland from the mouth of the Goulais River. For the last base line, Johnston completed three observations of Polaris for bearing control and magnetic variation determination.

On 20 October, Salter, and Johnston, *et al* travelled to the boat left at Goulais River, then on to the village of Sault Ste. Marie, arriving on 22 October, where the men were dispatched to Penetanguishene with the boat and remaining supplies. PLSs Salter and Johnston took a steamer to Detroit, arriving on 24 October at 1 pm, then arrived in Chatham at 11 pm.

On 26 October PLS Salter was in his office preparing papers. The following day he travelled to Toronto where he passed several days preparing reports and awaiting any further instructions from the Crown Lands Department. On 17 October, while in Sault Ste. Marie he had received instructions to retain his parties for working through the winter, which instructions were almost immediately rescinded. On 31 October, Salter travelled to Barrie, then to Penetanguishene, arriving on 1 November where he found PLS Donnelly awaiting his arrival. Salter prepared his pay lists and when the boat arrived with his men, he settled the accounts and paid the work party, and Donnelly settled the accounts of his Penetanguishene men. On 10 November Salter and Donnelly travelled to Barrie, and on to Toronto where PLS Salter paid off further accounts relating to the survey, returning to Chatham on 14 November.[58]

Philip S. Donnelly, PLS

On 24 June 1857 PLS Donnelly, having travelled with PLSs Salter and Johnston since their departure from Chatham, arrived at the 36 Mile post on the second base line with his party and provisions on the same day that PLS Johnston had set it. While Johnston continued to survey the second base line west, Donnelly commenced running a range line northerly from the post, on an astronomic bearing of N 0° 32’ 30” W to be parallel with the principal meridian. As instructed, he established posts at six and twelve mile distances; however, he set his northerly post at 16 miles and 66 chains, which he reached on 7 July. The country through which he passed was rough and rocky, and progress was slowed by the difficulty in cutting through standing burnt pine trees. He was running low on provisions before reaching 18 miles; however, he was able to overview the northerly ground from a high rock bluff, and he concluded it was similar to the ground he had surveyed over. He completed three observations of Polaris and one observation of the sun for bearing control of the line and magnetic variation determinations.

Upon arriving back at the second base line, Donnelly commenced running the range line south on a bearing of S 0° 32’ 30” E on 10 July. He continued surveying southerly, sending men to retrieve provisions from a cache that had been left near the Spanish River. On reaching the Spanish River with the line, eight men were sent to retrieve the rest of the cached provisions and the line continued to the shore of Lake Huron, arriving on 5 August, where a post was set at 30 miles and 69 chains, thirty links back from the water’s edge. Nine astronomic observations were made of Polaris for bearing control and variance determination, and the sun was observed for a determination of latitude at the bank of the Spanish River.

Donnelly’s party travelled westerly to the HBC post at La Cloche where he acquired canoes, provisions, and clothing for some of the men, and they were able to grind their axes, departing 7 August for the Mississagi River, arriving two days later. The party ascended the river for three days, then set out cross country in a north-easterly direction to intersect the second base line. From 12 August the party packed in their supplies and canoes, taking occasional latitude observations of the sun until reaching the second base line latitude on 24 August.

Travelling easterly, they intersected with Salter and Johnston surveying the second base line westerly on 26 August, before arriving the following day at the post set 90 miles west of the principal meridian, from which Donnelly was to run range lines.

While the rest of the men were packing in the supplies, Donnelly and his explorer examined the lands to the north of the post and concluded they were the same as the lands they had traversed during the survey of his previous range line north of the base line. He decided to only run a range line southerly from the base line on the bearing of S 1° 22' E, corrected for convergence to be parallel to the principal meridian.

After astronomic observations of the sun and, later the same day, of Polaris, Donnelly commenced running the southerly range line for current exploration and future township sidelines on 29 August, arriving at Lake Huron on 14 September, after surveying 23 miles and 48 chains. A further five astronomic observations of Polaris for bearing control and magnetic variation determination had been completed.

The following day the party again ascended the Mississagi River, this time being able to traverse all the way to the second base line via the river and chain of lakes to where it intersected the base line at 109 miles west of the principal meridian. The party arrived at the Mile 108 post on 18 September, where PLS Donnelly was to survey his next range line. Again, Donnelly only surveyed the southerly range line on a bearing of S 1° 39' E to Lake Huron.

Commencing the line from the 108 Mile base line post on 19 September, he sent two men and canoes down the Mississagi River to where the range line would cross it, rather than drag the canoes along the line. After crossing the river by the canoes on 24 September, the line continued southerly while men were sent back up the river to retrieve and transport the cached supplies. On 29 September, four men were sent back to take the canoes down the river to where the line would intersect Lake Huron. At 15 miles and 67.5 chains south of the second base line, a post was set at the range line intersection with the surveyed rear boundary of Reserve No. 12 (Thessalon)[59] to the Robinson-Huron Treaty, which meant that the southerly portion of the range line ran through the reserve. A duly marked post was set at 18 miles; however, the remainder of the line to Lake Huron was run on a compass bearing. For the northerly eighteen miles of the range line, five observations of Polaris were completed for bearing control and for variation determination. On 5 October, the range line intersected Lake Huron at 19 miles and 72 chains from the base line.

On 6 October, the rest of the party having arrived with the large canoe, PLS Donnelly travelled westerly along the shore to the Bruce Mines, where he received a message from PLS Salter to close his work for the season and travel to Penetanguishene. He returned to the Thessalon River where the rest of his party waited.

PLS Donnelly and his party set out for Penetanguishene the following day; however, in the face of several days of bad weather and headwinds to gale proportion, progress was slow, the party arriving in Penetanguishene on 21 October. Donnelly discharged the men who lived there, and sent his chain-bearers, explorer, and one axeman home; while he remained there to await PLS Salter, who arrived on 1 November from Chatham via Toronto, and Barrie. Salter

and Donnelly settled their accounts and paid those men employed in their work parties who resided in and around Penetanguishene. On 10 November Salter and Donnelly travelled to Barrie, and on to Toronto where PLS Salter paid off further accounts relating to the survey, then they travelled to Chatham on 14 November, with Donnelly travelling from Chatham to Moore, via Windsor and Detroit, arriving home on 17 November. Subsequently, his Diary, Field Notes and Report were provided to PLS Salter for compilation of Salter's plan, and final report for the survey.[60]

Mr. Donnelly's report to PLS Salter outlined the survey and travel chronology for his field work and provided a summary of the nature and character of the country he traversed and explored. With respect to the range line run northerly from the second base line located 36 miles west of the principal meridian, PLS Donnelly reported the land to be a series of " … high, broken, and precipitous rock ranges with small valleys of stony land between," the ridges being comprised of granite for the first ten miles, then quartz appeared to the end of the shortened line with strong indications of minerals present. The range line to the south of the base line traversed a "… well timbered and fertile tract, sufficient in extent for three townships on either side of the line…", but he noted that the La Cloche Mountain range would make them inaccessible for settlers coming from Lake Huron.

For the range line run southerly from the second base line located 90 miles west of the principal meridian PLS Donnelly reported crossing low granite ridges and valleys of good soil, "… heavily timbered, but not of sufficient extent as to render them serviceable for agricultural purposes." He also reported a vein of copper ore in quartz, for which he provided a sample, from eighteen miles south of the base line.

For the range line he ran southerly from the second base line at the 108 Mile post west of the principal meridian, Donnelly reported that the land included increasingly good and arable soil in valleys suitable for farms between low ridges of rock and swamp, the greater amount being arable soil, becoming granite rock ridges and lakes before reaching the Thessalon Indian Reserve, then becoming cedar swamps and low ridges of rock to Lake Huron. He also suggested a road could be constructed from the lake to the tract he described.[61]

Thomas W. Herrick, PLS

After receiving specific instructions by letter from PLS Salter dated 23 May 1857, PLS Herrick travelled to Collingwood on 25 May; however, he was not able to hire a boat there so he sent an assistant to Penetanguishene to hire a boat that would travel to Collingwood later in the week. He returned to Toronto and acquired supplies over two days, then returned to Collingwood with his picket man, explorer, chain-bearers, storekeeper, cook, an axeman, and provisions. However, the hired boat was unable to penetrate the pack ice and returned to Penetanguishene. Herrick sent his party and provisions ahead in a schooner to the Musquash River; then travelled himself by land to Penetanguishene. There he hired a further five men for axemen and packmen and set out on 3 June by sail and rowing for the north shore of Lake Huron, picking up the remainder of his party at Musquash Mills, reaching Killarney on 8 June. Two canoes were acquired at Wikwemikong and another two from La Cloche. Upon arriving at the Wallace Mine at the mouth of the White Fish River, the boat was sent to Killarney for more

supplies. On the boat's return, it was sent back to Collingwood, along with one man who had fallen sick. Three men were sent to acquire another canoe, and the rest of the men and provisions commenced the ascent of White Fish River on 15 June. Provisions were cached on the Spanish River enroute, and they reached PLS Salter's post on the principal meridian at the easterly end of the second base line, 12 miles north of the first base line, on 24 June. Immediately, men were sent back for provisions.

On 26 June Herrick's party started their survey to extend the principal meridian north for 18 miles, or three townships, and explore the adjacent lands. Only after running nearly two miles of line was PLS Herrick able to make his first astronomic observation for azimuth and found the line he had run was in error, bearing too far east of astronomic north. He returned to Salter's post and started his survey afresh on 3 July.

The line proceeded, reaching more than 14 miles on 21 July when the party ran out of food. During that interval, two men became sick on 6 June, and another man became sick on 18 July. There had been three trips to the provisions cache; however, the surveying party was three days without food while waiting for the return of the third expedition to the cache. On 25 July, the work was restarted, and another provision party was dispatched to the cache. The post for 18 miles north of the second base line was set on 27 July. Overall, eleven observations on Polaris had been made to control the bearing of the line and to determine magnetic variation. One observation of the sun for latitude had also been completed at the 7 Mile point of the work.

The party travelled overland along the line they had just run, then down Salter's line to White Fish Lake on 31 July. On 3 August, after patching their canoes and grinding their axes, PLS Herrick's party commenced running the principal meridian astronomically south from the post set by PLS Salter at White Fish Lake and through a pole set by PLS Salter where he had started his principal meridian line at Round Lake. Once again, after running 15 miles of line, the party was short of food and awaiting the return of the canoes with provisions from the cache on 21 August. PLS Herrick's storekeeper and another had made a return trip to Toronto, then were dispatched to search for any further directions from PLS Salter, returning to the line on 24 August. On 25 August, survey work continued and the line reached Lake Huron at Collins Inlet on 3 September, after 25 miles and 2.23 chains, having observed Polaris on twelve occasions for bearing control. It appears that a distance error was made that was not detected until the field notes were being compiled, as each of the intended corner posts set to demark six, twelve, eighteen, and twenty-four miles were stated in the field notes to have been set 60.77 chains north of their correct positions.[62]

The following day Herrick arrived at the trading post at Killarney where he found a letter of further instructions from PLS Salter and £100. From there he travelled westerly to the Wallace Mine just west of the mouth of the White Fish River, where he sent one canoe and six men to Round Lake to retrieve the canoes that had been left there. He continued westerly along the coast battling head winds and storms to the HBC post at La Cloche, on to the Serpent River, then on to the Blind River and the Mississagi River, on 16 September, (where he missed PLS Donnelly's party by one day as they ascended the Mississagi River on 15 September).

Marshalling the supplies and sending the boat and some of the party back to Killarney for another load, Herrick and part of the party ascended the Blind River with their Indigenous guide, and after a series of portages from lake to lake reached the post set by PLS Johnston on the second base line at the 72 Mile point west of the principal meridian on 21 September. After another false start on the wrong bearing, PLS Herrick re-commenced surveying the range line northerly on the astronomic bearing of N 1° 05' W to make it parallel with the principal meridian on 24 September, observing Polaris at its eastern elongation almost nightly to maintain the correct bearing. Despite having sent two Indigenous guides back to help the second supply party find their location, the party ran short of food four days after re-commencing the survey, and it was another 10 days before the supplies arrived on 8 October. The supply party was dispatched the following day to return to Lake Huron and then to Sault Ste. Marie with a letter for PLS Salter and to acquire more provisions.

On 10 October, Herrick reached the northerly extent of his range line, having set future township corner posts at six, twelve, and eighteen miles north of the second base line, and having observed Polaris on thirteen occasions for bearing control and magnetic variation determinations.

The party walked the line back to the base line post and commenced to run the range line southerly on the astronomic bearing of S 1° 05' E on 14 October. After surveying 6 miles, the supply cache was exhausted and the supply party that had been sent to Sault Ste. Marie had not yet returned. PLS Herrick and six men travelled to the coast in a canoe, reaching the mouth of Blind River on 25 October at 9 pm, where they learned that the supply party had ascended the river the same day but by a different channel. The following day he travelled to the HBC post on the Mississagi River to acquire further provisions to take inland. He overtook PLS Salter's boat party wind bound and sheltering on an island near the Serpent River, enroute to Penetanguishene. They directed Herrick to travel to the HBC post at Sault Ste. Marie where Salter had left him further instructions. Herrick and his party ascended Bind River with the supplies and arrived back at the range line on 30 October, finding that the earlier supply party had still not arrived. He also recorded that some of the smaller lakes were frozen over.

PLS Herrick continued the range line south; however, poor weather limited the number of astronomical observations to five for the 23 miles and 1.12 chains run to Lake Huron. Posts were set to mark future township corners at six and eighteen miles, the twelve mile corner being in Esten Lake, for which a witness post was set two chains north of the corner.

Arriving at Lake Huron and completing the range line survey on the morning of 14 November, Herrick started for Toronto that afternoon to acquire winter supplies and to release some of the men who did not wish to work into the winter, sending the others to Sault Ste. Marie to await his return. On 17 October, while in Sault Ste. Marie PLS Salter had received instructions to retain his parties for working through the winter, which instructions were almost immediately rescinded; however, the most recent instructions that PLS Herrick had received were to be prepared to work through the winter. Fortunately, poor weather forced Herrick to stop at the HBC post at La Cloche where up to date instructions from PLS Salter had been left for him to discharge his party for the winter.

On 17 November Herrick left La Cloche in a small boat and travelled to Killarney, and on the 19th he hired a schooner to travel to Sault Ste. Marie to pick up the wintering party he had sent there to take them to Penetanguishene. Herrick took a schooner to Owen Sound, then travelled to Toronto, arriving 25 November. The schooner with his men arrived at Penetanguishene on 4 December, where Herrick paid and discharged those men who were from there, the rest of the men from Toronto being discharged on 5 December. Subsequently, PLS Herrick's Diary, Field Notes and Report were provided to PLS Salter for compilation of his plan, and final report for the survey.[63]

PLS Herrick's report to Mr. Salter provided an account of his field work and travel activities during the season with a detailed description of the nature of the country examined during his survey. Regarding his northerly extension of the principal meridian from the second base line, PLS Herrick reported the ground for the first six to eight miles as "… undulating, crossed at intervals by ridges of granite and greenstone rocks," with good soil of a sandy loam with a clay sub-soil and a deep soil of vegetable matter in the lower valleys. North of the second branch of the Spanish River the ground became "… rocky and generally unfit for cultivation." He also reported "… a good deal of impure magnetic iron ore," which caused significant variation of the compass needle.

For the principal meridian line run southerly from the first base line, PLS Herrick reported passing through "… some rich undulating country, intersected here and there by granite ridges." About the area around Lake Penage, he reported:

> … some fine land heavily timbered with maple. Mixed with red and white pine, of very superior quality and favourably situated for lumbering purposes, as there is direct water communication by Lake Penage and White Fish River to Lake Huron.

He, further, reported that the land "… disimproves," within a few miles of the Lake Huron shore, becoming barren and rocky, although with some groves of "… fine pine."

Regarding the range line surveyed north of the second base line located 72 miles west of the principal meridian, PLS Herrick reported that the country was a great improvement from the principal meridian ground with the soils being better and the surface less uneven.

> We passed through a great deal of land of good quality and well adapted for settlement, the timber in general consisting of pine, maple, birch, spruce, etc.
>
> The country is well watered by numerous streams and beautiful lakes, some of which contain lake trout, white fish, black bass, etc. in abundance.

He also reported finding micaceous iron ore of good quality in masses lying on the surface and iron to be widely spread throughout the district.

For the range line southerly from the base line, he recorded passing through "… a great deal of good rolling land, well timbered with red and white pine of good quality," until approaching the Lake Huron shoreline where the land becomes "… rocky and barren and the timber less luxuriant".[64]

Thomas N. Molesworth, PLS

Prior to receiving specific instructions by letter dated 23 May from PLS Salter, PLS Molesworth started his field preparations and acquisition of equipment and provisions on 22 May, hiring his explorer, chain-bearers, six axemen, and a cook. They set out for the north shore of Lake Huron from Goderich on 27 May, arriving at Killarney two days later. While awaiting the arrival of PLS Salter, Molesworth's party dried provisions and acquired canoes, and six Indigenous men were hired as packmen. Salter arrived on 7 June and met with PLS Molesworth. The following day the parties travelled on; Salter to the Spanish River and Molesworth to White Fish River, which he ascended to Round Lake, then through White Fish Lake and a series of portages and rivers, arriving at the second base line on 20 June. Several days were spent drying, caching, and moving provisions to the post set by PLS Johnston in 1856 located 18 miles west of the principal meridian on the second base line.

From that post, PLS Molesworth surveyed a range line for current exploration and future townships northerly, on an astronomic bearing of N 0° 16' 28" W, to be parallel with the principal meridian, commencing on 30 June. The northerly line was completed on 18 July, with posts having been set at the future township corners six, twelve, and eighteen miles north of the base line. One astronomic observation of Polaris and ten observations of the altitude of the sun were made for bearing control and determination of magnetic variation.

The camp was moved south to the base line post and on 22 July the survey of the range line southerly on the astronomic course of S 0° 16' 28" E was commenced. While the work was interrupted for several rain days, the time was utilized to move the camp and provisions on those occasions to keep up with the survey advances. The work was interrupted after 6 miles to search for a canoe of supplies that had been taken up the wrong branch of the Spanish River, then having to transport them across land to the line. The survey was resumed on 10 August and the line was completed to Lake Huron, despite an abundance of wet weather, rough terrain, and the loss of a canoe in some rapids on the White Fish River, on 7 September. Posts were set at the intended six mile intervals for a total distance of 30 miles and 74.5 chains, and fifteen astronomic observations of the sun's altitude had been completed for bearing control.

The party travelled to nearby Killarney where there were instructions from PLS Salter dated 22 July waiting for him. Mr. Molesworth acquired further provisions, then travelled to La Cloche via Little Current, portaging to the Spanish River, then up the Spanish River and a portage to the Aux Sables River, then up the Aux Sable River until it became too shallow to float the canoes, requiring him to cut a road and portage to the second base line. Molesworth reached the post set by PLS Johnston earlier in the year located 54 miles west of the principal meridian on the second base line, arriving 25 September.

The following day PLS Molesworth commenced running a range line northerly on an astronomic bearing of N 0° 49' 10" W to be parallel with the principal meridian, for a distance of 18 miles, reached on 9 October. He posted the future township corners at the required intervals of six and twelve miles. The most northerly post was set at the distance of 16 miles and 67.12 chains from the base line because the seventeenth and eighteenth miles of line were within

Green Lake. There were eleven observations of the sun's altitude and one observation of Polaris at its eastern elongation completed for bearing control.

The party returned to the base line with the equipment and provisions on 13 October, and the following day commenced running the range line southerly on the astronomic bearing of S 0° 49' 10" E. Other than three Sundays, the work was only interrupted by poor weather, including one day where the trees were full of snow. The Spanish River was reached on 5 November at 24 miles and 26.1 chains. Posts had been set at the required township corner intervals of six, twelve, eighteen, and twenty-four miles, and the termination post was set at the edge of the mouth of the Spanish River because Reserve No. 5 (Spanish River) under the Robinson-Huron Treaty is located between the south shore of the river and the north shore of Lake Huron.

PLS Molesworth and his party travelled to the HBC post at La Cloche where he was able to acquire a boat to transport the men home. They spent the next seven stormy days, including three wind bound days, travelling the thirty-seven miles easterly along the coast of Lake Huron to Killarney, where he discharged his seven Indigenous packmen. The rest of the party set sail on 13 November down the westerly coast of the Bruce Peninsula arriving on Main Station Island two days later, where they were wind bound for four days. Setting sail on 19 November under rainy weather, a heavy gale and snowstorm from the south-west blew up in the afternoon and the boat was driven ashore five miles north of Southampton, "… and my boat broken to pieces the following night." Molesworth was able to save his field notes, instruments, and luggage, but lost his tents and provisions. The party then walked the sixty-four miles to Goderich, through snow as deep as two feet, arriving on 24 November, where he discharged his men.

PLS Molesworth recorded that he spent nine days preparing plans of the range lines that he surveyed, which with his Diary, Field Notes and Report were provided to PLS Salter for compilation of his plan, and final report for the survey.[65]

Mr. Molesworth's report to Mr. Salter briefly summarized his survey activities for the field work completed, then included a detailed summary of the nature, character, and topography of the land that he traversed and explored. With respect to the range line run north of the second base line, 18 miles west of the principal meridian, Molesworth described the country as extremely rough and broken, with precipitous ledges of granite as much as one hundred feet high, with little soil cover, with timber primarily comprised of white and red pine, balsam, and spruce, and with few of the trees being large enough for lumbering. The soil that was noted was not of sufficient depth or extent to be suitable for agricultural purposes.

Southerly from the base line, Molesworth reported that the land was much the same as to the north, then becomes less precipitous, undulating with a good soil and a mixed timber growth, then turns level but with numerous granite boulders at the surface. Further south he noted a series of rocky ridges alternating with sandy valleys, the hills south of the west branch of the Spanish River rising to a height of four hundred and fifty feet above the river. At 27 miles south of the base line, the La Cloche mountains, "… a bold and lofty rocky range of white quartz hills, lying in a direction parallel to Lake Huron," is crossed, the line terminating at their southerly base. Molesworth summarized:

> In concluding my remarks on this line, I consider it, throughout its whole extent, too rough in surface, too much broken by rocky ridges and lakes, and possessing too small an extent of good soil in any one place to render it fit for purposes of settlement. The best portion of land which I passed through in its extent being that from the base line to 6 miles south, and this tract of land would be too much isolated to make available by itself.

With respect to the range line run north of the second base line, from the 54 Mile post west of the principal meridian, PLS Molesworth noted that the land was more level and with more gentle slopes than his prior range line, but that they have the same "… character of surface" as the previous range line, with rock appearing at the surface in precipitous ridges at the southerly hill faces.

Proceeding southerly from the base line the surface is similar as to the north, then becomes more level with a series of abrupt steps of bare rock. Overall:

> The character of this line on the whole is better than the [prior]; it is more level, possesses more available soil, and has better timber, but it is altogether too rocky in its surface to make available for good settlement. The best part of it is from 12 miles south of the base line to the Spanish River. A few townships might be laid out on each side of the line here, suitable for a people coming from a mountainous country, who with economy and labour might make a good settlement.[66]

A.P. Salter, PLS and James Johnston, PLS
16 November 1857 to 20 January 1858

PLS Johnston reported that after arriving in Chatham from Lake Huron on 24 October, he was employed from 26 October 1857 to 20 January 1858 in compiling and drafting the Plan of Base, Meridian, and Range Lines, and in preparing his report and diary. PLS Salter reported that after paying out his men and returning to Chatham from Toronto on 14 November, he was employed from 16 November to 21 December in the preparation and examination of accounts, field notes, his diary and report, and preparation of the plan for the survey.

On 11 February 1858 PLS Salter delivered his plan[67] and final report, together with the reports of PLSs Donnelly, Herrick, and Molesworth, to the Commissioner of Crown Lands for the base, meridian, and range lines survey just completed.[68] By letter dated 13 February 1858, the field notes, and diaries of PLSs Salter, Johnston, Donnelly, Herrick, and Molesworth were forwarded to the Crown Lands Department.[69]

PLS Salter's final report on the base, meridian, and range lines surveyed in 1857 continued from his report of the year before, which had dealt with the exploration of the country east of the Spanish River to Lake Nipissing. The final report incorporated the overall summary information provided by the reports of PLSs Donnelly, Herrick, and Molesworth; however, he did not specifically itemize his observations with respect to each line run in 1857 by himself or by Mr. Johnston.

Mr. Salter did report on the sections of land located westerly from the intersection of the second base line with the Spanish River, at 32 miles west of the principal meridian, where the 1856 field work had ended. Highlights included:

> Westward of the main branch of the Spanish River for 35 miles the surface is much broken by rock ridges, and although many valleys of good land were crossed, bearing hard wood timber, they were isolated, and this section is thereby rendered unfit for settlement at present.
>
> …
>
> From this point for 24 miles, many tracts of good arable land were met broken by rock ridges.
>
> …
>
> In this section … the surface is more uniform and the soil deep and rich, being for the most part a fine sandy loam resting on white clay.
>
> …
>
> … In this section several fine townships can be obtained south of the [base line].
>
> …
>
> From this point to the [Mississagi River], a distance of 18 miles, the surface is much diversified … and taken as a whole this section offers a fair field for settlement.
>
> …
>
> Westward from the [Mississagi River] to the termination of the Base Line on Lake Superior, the whole extent of country is fit for settlement, - though the surface is occasionally broken by the rock ridges, which I have above observed form a marked characteristic in the topography of the whole country: this section contains many extensive tracts of valuable arable land, well timbered, and watered by numerous lakes and rivulets of excellent water.

PLS Salter's report continued, to describe the rivers providing access, and some impediment, to the inland; the pine timber capabilities of the rougher areas of land; and the potential mineral wealth that was noted during the explorations. He reiterated his conclusions following the 1855 exploration that many portions of the country surveyed and explored from Lake Nipissing to Lake Superior include "… extensive valleys of excellent land, well fitted for purposes of settlement". Having already reported in his 1855 report on the agricultural, mineral, and timber wealth of the country, he concentrated here on the settlement capabilities, and recommended:

> I am of opinion that settlement should be pushed from the westward to the eastward; or in other words that the tract of country in rear of the village of [Sault Ste. Marie], bounded on the West by the [Batchewana Bay], and on the eastward by the [Mississagi River], should first be surveyed and offered for settlement.

Salter supported that position by acknowledging that the westerly explored lands were more accessible by their proximity to lakes Superior and Huron, and the St. Marys River; and the proximity of the village of Sault Ste. Marie and the settlement at the Bruce Mines, as well as HBC posts and mills that would support settlements, and "… upon which settlers can fall back in case of need."

He also referenced conversing, through interpreters, with inland First Nations people who described land at the foot of the height of land, (then the northerly limit of the province), in the vicinity of Green Lake at the head waters of the Mississagi River, as "… a valley of considerable width, unbroken by rock ridges or Lakes, stretches eastward and westward for a great distance."

The report also noted the mitigation of the difficulties of access and ground reference for future exploration of mineral and timber wealth provided by the survey just completed, as follows:

> This difficulty is now obviated, as by the Base and Range lines parties wishing to explore the country for mineral or other wealth, can readily do so, means of egress to the coast being opened at every 18 miles, rough and rugged though some may be, at which distances on the Base line blazed line are surveyed to the coast of the lake. The base has also posts at every six miles duly marked, and a tree at every mile marked in chalk to note the distance.

Salter's report closed by expressing his thanks to the other surveyors appointed to the survey, "… which has been one attended with considerable mental and bodily labour, and at times much anxiety and deprivation …".[70]

In his report of the Commissioner of Crown Lands, of Canada, for the Year 1857, Commissioner L.V. Sicotte summarized:

> During the past year, P.L.S. Salter, and his assistants, Messrs. Johnson (sic), Herrick, Molesworth and Donnelly, continued and completed the survey of a base line on the North Shore of lake Huron, and traced meridian lines at intervals of eighteen miles, thoroughly exploring the country on both sides of these lines. The area of the tract over which their survey extends is about 8,400 square miles, or five millions of acres; the easterly portion of which, owing to the land being generally broken and remote from settlements, does not at present offer any inducement to the settler; but the superior quality of the soil in the western section and its vicinity to Sault Ste. Marie, afford a great facilities for colonization. (See Mr. Salter's Report of Survey, Appendix T.) Mr. Salter has been instructed to proceed to Sault Ste. Marie on the opening of the navigation, and sub-divide two townships in its vicinity, with a view to meet the demand for lands by the immigrants of the ensuing season.[71]

Figure 2 illustrates the area explored and the base, meridian, and range lines surveyed over both field seasons.

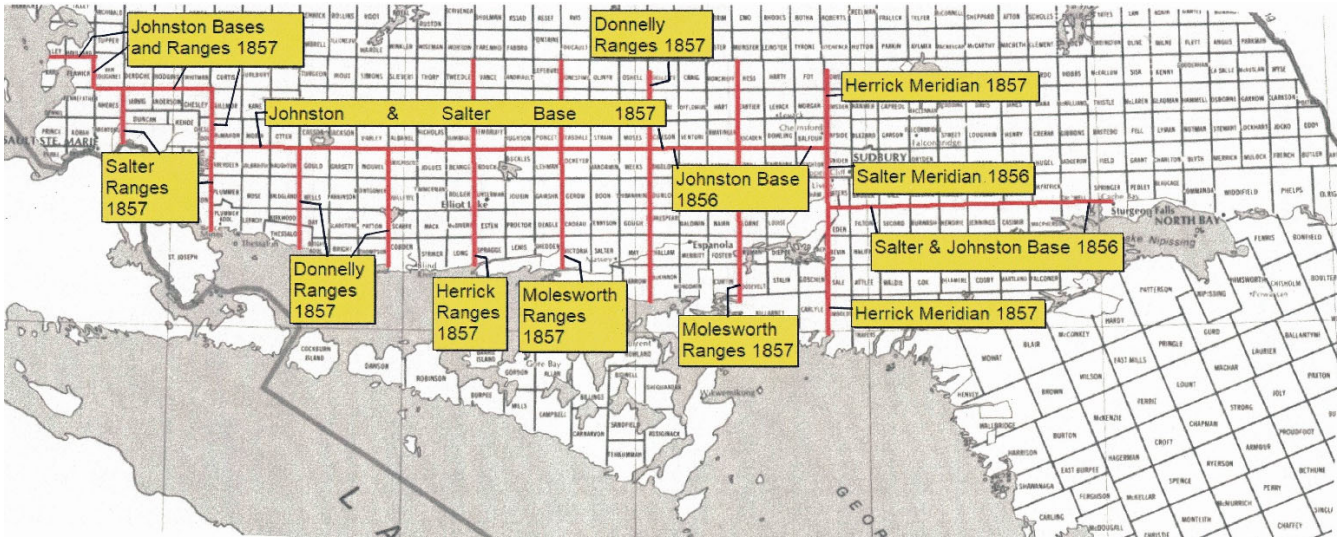

Figure 2: A.P. Salter's Base, Meridian, and Range lines superimposed on a partial copy of Map 28, Geographic Townships in the Province of Ontario. Source: Ontario Ministry of Natural Resources and Forestry, Copyright: 2020 Queens Printer Ontario.

AFTER 1857

With respect to the area surveyed, subdivision of the lands into townships and sections of land for settlement and development went into effect almost immediately, in accordance with PLS Salter's recommendations to start from the west or Lake Superior end of the survey, within the newly-created Temporary Judicial District of Algoma.[72] The initial two surveyed townships were Korah and Tarentorus, located westerly and northerly of the village of Sault Ste. Marie, respectively.

By 1862, the townships of Macdonald, Prince, Parke, Awenge, Fenwick, Pennefather, Dennis, and Aweres, to the north of the village had been surveyed; the latter four made possible by the surrender of Reserve No. 15 (Batchewana), effected in 1859.[73] Also, by 1862 the townships of Rose and Lefroy, on the north shore of Lake Huron near Thessalon, were complete; the townships of Spragge, Esten, and Salter north of the mouth of the Serpent River were complete, and the township of Patton was in progress. They had been surveyed into what became known as Pattern 2 of the 640 Acre Sectional township system[74], in the American style as PLS Salter had envisioned. Many of the projected townships were initially allocated by number for timber permits. Further, the Great Northern Road extending from Goulais' Bay, easterly, to the Spanish River had been located, and part of it constructed as a means for both winter and summer communication between the eastern portion of the Province of Canada and the settlements around Sault Ste. Marie and the Bruce Mines, which were connected to the road by branch roads.

Ultimately, thirty-five Pattern 2 townships were surveyed in the District of Algoma, and seven were surveyed north of Lake Superior. However, beginning in 1874, revisions were made to the fabric within the six-mile township outline:

> The Ontario survey fraternity was never entirely happy with the system of sections and quarter sections, a system that was foreign to all previous survey experience in the Province, and which, … required more expensive surveys. So in 1874 a modification was made in the six-mile square township that would provide it with the familiar system of concessions and lots.
>
> Instead of dividing the square mile section into 160 acre quarter sections, it was divided into two 320 acre lots by a line drawn from a post planted in the south boundary. This system, termed the 640 Acre Section Pattern 3,[75] … was used from 1874 to 1906 … (Sebert 1980: 92).

The new pattern applied to townships either laid out or projected in the remaining lands within Salter's framework survey, or lying to the north of it and to the north of the French River, Lake Nipissing, and the Mattawa River to the easterly boundary of Ontario; up to the Great Clay Belt, where another change was made in 1906 to adopt the nine-mile square townships in the 1800 acre sectional townships with double fronts system, with some 1200 acre sectional townships laid out within the nine-mile square outline.[76]

> The 1800 Acre Section township was modified slightly in the survey of five townships in 1917 and one in 1918 in which the lot size was reduced to 100 acres providing a 1200 acre section. But with these exceptions, the 1800 Acre Section township was used until the township surveys were stopped in 1935 after the survey of Moose Township on James Bay. (Sebert 1980:93)

Two years after completion of Salter's survey, by instructions dated 19 June 1860, PLS Herrick was engaged to undertake an exploration survey of the north shore of Lake Superior from Sault Ste. Marie to the Kaministiquia River at Fort William, now Thunder Bay, within the Robinson-Superior Treaty lands. PLS Herrick's survey did not follow the base and meridian line pattern. His traverse was to approximately parallel the north shore of Lake Superior, about twenty miles inland, and include exploration of the land on either side of his lines; to complete a detailed inventory of the nature, topography, and character of the lands traversed as well as to determine the site of a future road to connect the end locations.[77] The base and meridian lines did come later in that area in advance of the township surveys.

However, beyond the immediate exploration purposes for the base, meridian, and range lines surveyed under PLS Salter across the north shore of Lake Huron, and the introduction of the American system of township survey into the Province, the pattern was established for the initial survey of principal meridian lines and appropriately spaced base lines along parallels of latitude to provide a surveyed framework for initial exploration of northern and north-western Upper Canada/Ontario, and for the subsequent layout of surveyed townships or township outlines, or for the projection of future townships (Ladell 1993:160, Figure 12.1). Such surveys provided a more systematic and relatively accurate approach to initial exploration and assessment of Crown land, mineral, and forestry resources; thereby facilitating planning and the better allocation of Crown Lands Department resources for subsequent, and more detailed, exploration and parcel delineation surveys, to make good, habitable farmland, or mining land, or timber resources available, for many years into the future.

The importance of the base and meridian line surveys was recognized by the introduction of a new section in the revised *Surveys Act, 1958*, which provided:

> 8. Every base line and meridian line surveyed under the instructions of the Minister before the 28th day of March, 1956, that are shown on the original plan thereof shall be deemed to have been made by competent authority and are true and unalterable and shall be deemed to be defined by the original posts or blazed trees in the survey thereof.[78]

The 1855 exploration, and subsequent 1856 to 1858 base, meridian, and range lines survey completed under PLS Salter, which required as much, if not more, time, energy, and deprivation to gain physical access and to maintain food and supplies to the field parties, as well as to travel to and from the north shore, as it did to complete the actual surveying, represents Mr. Salter's vision for the future survey and development of the Province. That vision was initially put in place when PLS Salter, in his report on his 1855 exploration survey, made his recommendation for any future survey of the explored area to adopt the six-mile square American township system. The vision was followed up when he wrote the Commissioner of Crown Lands to revise his 1856 survey instructions to run a traverse line from Lake Nipissing to Lake Superior for exploration to, instead, run base lines and a principle meridian line that would facilitate exploration as well as adoption and subsequent layout of the American style township surveys. His vision was realized when he, and those who assisted him, delivered a valuable and significant survey that influenced the subsequent surveys and development of northern and north-western Upper Canada/Ontario well into the future.

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ABBREVIATIONS

AO – Archives of Ontario
APG – Assistant Provincial Geologist
2 CNLC – Canadian Native Law Cases, Volume 2
FNB – Field Note Book
HBC – Hudson's Bay Company
JLA – Journals of the Legislative Assembly of the Province of Canada
LAC – Library and Archives Canada
MNR – Ministry of Natural Resources
OLS – Ontario Land Surveyor
PLS – Provincial Land Surveyor
Vic. – Queen Victoria. X Vic. denotes the Xth year of the reign of Queen Victoria, within which the referenced item was published or otherwise made official.

ENDNOTES

[1] Appendix G to Vol. 8, Journals of the Legislative Assembly of the Province of Canada, ("JLA"), 12 Vic., 1849; and Appendix V to Vol. 9, JLA, 14 Vic., 1850: Reports of William Logan and Alexander Murray on their geological examinations and mapping of the north shore of Lake Huron during 1847 and 1848.

[2] Appendix G to Vol. 8, JLA, 12 Vic., 1849: Report dated 14 January 1848, Alexander Murray to W.E. Logan.

[3] Appendix 52 to Vol. 15, JLA, 20 Vic., 1857: Report dated 11 June 1855, Page 57, Alexander Murray to W.E. Logan.

[4] Library and Archives Canada, ("LAC"), RG 1, E8, Vol. 47, Reel H-1789, Order-in-Council of 21 March 1853 relating to Mining Locations on lakes Superior and Huron.

[5] LAC, RG 1, E8, Vol. 54, Reel H 1793, Order-in-Council of 9 June 1855 relating to Mining Locations on lakes Superior and Huron.

[6] Ministry of Natural Resources, ("MNR") Ontario Crown Survey Records, Instructions to Land Surveyors, Vol. 5, Pages 255 – 256. Letter dated 18 June 1855, Cauchon to Salter.

[7] *Ibid.* Page 254.

[8] *Ibid*. Pages 254 – 257.

[9] Ladell 1993: 114-155. After the war of 1812-14 the British Admiralty sought to prepare accurate hydrographic charts of the Great Lakes. Lieutenant Henry Bayfield spent four years charting Lake Huron and Georgian Bay, then in 1823 moved to Lake Superior for three summers. He then spent two years in England perfecting the charts.

[10] AO, RG 1-524-2, Box 5, B264391, File 1855 (4) Item #15. Pay list for A.P. Salter, PLS, relating to exploration of country bordering on the north shore of Lake Huron. Party consisted of two chainmen, one guide, and seven canoe men. Dated 26 November 1855.

[11] Appendix 37 to Vol. 14, JLA, 19 Victoria, ("Vic."), 1856: Report dated 26 January 1856, A.P. Salter to Joseph Cauchon. Also: AO RG I, Series CB-1, Box 1, Reel MS924/1: Diary of A.P. Salter, PLS, for Exploration North Shore of Lake Huron, from June 22 to November 10, 1855. (Sworn February 4, 1856).

[12] Appendix 37 to Vol. 14, JLA, 19 Vic., 1856: Report dated 26 January 1856, A.P. Salter to Joseph Cauchon.

[13] *Ibid.* Page 2.

[14] *Ibid.*

[15] Appendix 37 to Vol. 14, JLA, 19 Vic., 1856: Report dated 26 January 1856, A.P. Salter to Joseph Cauchon. Original report at: AO, RG 1-360, Box 6, B396495. Published copy also found at Toronto Reference Library, Film C21164.3, Reel 25. Published Reports include a reduced-scale copy of PLS Salter's Plan of Exploration prepared by the Crown Lands Department dated15 April 1857. Image of reduced scale plan found at: LAC, Maps, plans, and charts, V2/410/Huron//1857. *(See Figure 1)*.

[16] AO, RG 1, SR 16909, R-H-Stak, Container O-1468, Barcode B164599. Plan of A.P. Salter, PLS on his exploration of the north shore of Lake Huron, dated 1855 at a scale of one inch to one mile. This plan is 4 ft by 20 ft.

[17] AO, RG I, Series CB-1, Box 1, Reel MS924/1. Diary of A.P. Salter, PLS on his exploration of the north shore of Lake Huron, dated 4 February 1856.

[18] Appendix 37 to Vol. 14, JLA, 19 Vic., 1856: Report dated 26 January 1856, A.P. Salter to Joseph Cauchon. Pages 8 - 9.

[19] *Supra*, Note 12.

[20] Appendix 35 to Vol. 14, JLA, 19 Vic., 1856: Report dated 13 March 1856, Joseph Cauchon to Legislative Assembly of the Province of Canada. Page 56.

[21] Variation is the difference between the true (astronomic) north and the true (magnetic) north. The north magnetic pole is located well away from the true north pole. For an observer on the earth, the direction to each of those poles results in different lines. The angle between those lines is called magnetic *declination*. Declination is not constant. The change in the declination results from several *variations,* primarily Secular, Daily, Annual, and Irregular variations. Another source of variation is *local attraction*. Local attraction results from the effects on the observer's compass needle from such things as nearby location of ferrous ore bodies or metal materials on the observer. Overall: Variation is the algebraic sum of the magnetic declination, the declination variations, and the local attraction. By definition, Variation is negative if the north end of the magnetic north line is west of the true north; and is positive if the north end of the magnetic north line is east of the true meridian.
Variation [if –ve, then west; if +ve, then east] = True Bearing – Magnetic Bearing

[22] MNR Ontario Crown Survey Records, Instructions to Land Surveyors, Vol. 6, Pages 232-234. Letter dated 15 February 1856, Cauchon to Salter.

[23] AO, Series RG 1-5-0-1, register of letters received by the Surveying Department relating to surveys, Reel MS7547, Page 161, No. 7, dated 24 March 1856, A.P. Salter to J. Cauchon; AO, Series RG 1-5-0-2, register of letters received by the Surveying Department relating to surveys, Reel MS7547, Page 232, No. 10, dated 5 May 1856, A.P. Salter to J. Cauchon; MNR Ontario Crown Survey Records, Instructions to Land Surveyors, Vol. 5, Page 264, dated 17 May 1856, J. Cauchon to A.P. Salter.

[24] MNR Ontario Crown Survey Records, Instructions to Land Surveyors, Vol. 5, Page 264 dated 17 May 1856, J. Cauchon to James Johnston.

[25] AO, Series RG 1-5-0-1, register of letters received by the Surveying Department relating to surveys, Reel MS7547, Page 161, No. 11.

[26] *Supra*. Note 12. Pages 10-11.

[27] MNR Ontario Crown Survey Records, Instructions to Land Surveyors, Vol. 5, Page 265.

[28] Also of Chatham, Arthur Jones had accompanied PLS Salter on the 1855 Exploration of the North Shore of Lake Huron and was brought along on the 1856 base line survey as an assistant to conduct lateral exploration from the surveyed lines. Ultimately, he was also employed as a "Picketman" on the survey lines, and as "chain-bearer" and general labourer. Appendix 25(R) to Volume 5, JLA, 20 Vic., 1857, Report from Arthur Jones to A.P. Salter.

[29] MNR Ontario Crown Survey Records, Field Note Book, ("FNB"), 1919, two pages prior to page numbered 1, Field Notes – Base and Meridian Lines, North Shore Lake Huron.

[30] The origin and history for the subsequent renewal and perpetuation of this "Point of Commencement" is summarized in (Marlatt 2022: 8-12).

[31] Appendix 25(R) to Volume 15, JLA, 20 Vic., 1857: Report dated 22 January 1857 of Progress of Survey of Base Line North Shore of Lake Huron from A.P. Salter, PLS to Joseph Cauchon. Page 1 erroneously states the latitude of the base line as 46° 22' 09" N; however, no observations record that determination, and all references in the diary and field notes refer to 46° 22' 00" N as being the determined latitude.

[32] Appendix 52 to Vol. 15, JLA, 20 Vic., 1857: Report dated 1 March 1857, A. Murray to W.E. Logan. Murray also reported that his work that season frequently intersected with PLS Salter's base line work and provided very good checks on the accuracy of his own exploration work and measurements.

[33] *Supra.* Note 31. Page 1.

[34] *Ibid.*

[35] *Ibid*. Page 4.

[36] *Supra*. Note 32, Pages 100 – 101. This area became the initial nickel mining operation in the Sudbury Basin. Per (Ladell 1993: 161-162): "… the Creighton Mine went into production on the site of Salter's original discovery, a mine that for the next thirty years would be the world's leading nickel producer".

[37] *Supra.* Note 31, Pages 1-2. Also, Appendix 25(R) to Volume 15, JLA, 20 Vic., 1857: Report from James Johnston to A.P. Salter. Pages 1-2. Also, AO, RG I, Series CB-1, Box 15, Reel MS924/10: Diary of Base, Meridian & Range Lines, North Shore of Lake Huron by A.P. Salter from 2 June to 20 January 1857 and from 15 May to 31 December 1857. (Sworn 4 February 1858). Also, MNR Ontario Crown Survey Records, FNB 1919.

[38] Appendix 25(R) to Volume 15, JLA, 20 Vic., 1857: Report from James Johnston to A.P. Salter. Pages 1-2. Also, Appendix 25(R) to Volume 15, JLA, 20 Vic., 1857: Report from Arthur Jones to A.P. Salter. Pages 1-2.

[39] *Ibid.* James Johnston Report, Page 2. Arthur Jones Report, Page 2. Also, AO, RG I, Series CB-1, Box 15, Reel MS924/10: Diary of Base, Meridian & Range Lines Survey, North Shore of Lake Huron by James Johnston from 2 June 1856 to 6 January 1857 and from 3 May 1857 to 20 January 1858. (Sworn 4 February 1858). Also, MNR Ontario Crown Survey Records, FNB 1919, Pages 11-13.

[40] Although not a topic fully researched by this paper, it should be noted that the westerly 2.2 miles of the first base line and the southerly 2.4 miles of the principal meridian line were located within the White Fish Lake First Nation unceded reserve lands, Number 6 of the Robinson-Huron Treaty. The reserve had not been surveyed at the time of the work by J.S. Dennis, PLS in 1851-1852; although his instructions included it. The reserve boundaries were not determined until January 1889. In 1872 timber berths were licensed over the reserve lands by the Crown (Ontario), and in 1883 portions of the Townships of Graham and Waters were laid out over the reserve lands, also by the Crown (Ontario). Following a survey of the reserve in 1884 by the Crown (Canada),

and a surrender of the timber rights by the First Nation, those timber rights were granted by Crown (Canada) on behalf of the First Nation, to different parties. In an action before the Ontario High Court, Chancery Division, brought by the A-G for Ontario, it was necessary for the court to determine the boundaries of the reserve, pursuant to determination of federal and provincial jurisdiction and where any illegal cutting of timber had occurred. *Attorney-General for Ontario v. Francis, et al*., 2 CNLC, 6. Judgement given 19 January 1889. However, the reserve boundaries may not be final. See *Atikameksheng Anishnawbek v. Canada*, 2024 ONSC 4012 (CanLII).

[41] Appendix 25(R) to Volume 15, JLA, 20 Vic., 1857: A.P. Salter Report, Pages 2-3. Also, James Johnston Report, Pages 2-3. Also, Arthur Jones Report, Page 3. Also, AO, RG I, Series CB-1, Box 15, Reel MS924/10: Diary of A.P. Salter from 2 June 1856 to 20 January 1857, Pages 7-12. Also, Diary of James Johnston from 2 June 1856 to 6 January 1857, Pages 7-11. Also, FNB 1919, Pages 13-24.

[42] AO, RG I, Series CB-1, Box 15, Reel MS924/10: Diary of Base, Meridian & Range Lines, North Shore of Lake Huron by A.P. Salter, Page 12.

[43] AO, Series RG 1-5-0-1, register of letters received by the Surveying Department relating to surveys, Reel MS7547, Page 161, No. 2 of 1857. Reports published in the Journal of the Legislative Assembly for the Province of Canada, as Appendix 25(R) to Volume 15, 20 Vic., 1857.

[44] Appendix 25(R) to Volume 15, JLA, 20 Vic., 1857: A.P. Salter Report, Page 3.

[45] *Ibid*. Page 5.

[46] *Ibid*.

[47] *Ibid*.

[48] *Ibid.* Page 6.

[49] Appendix 25 to Volume 15, JLA, 20 Vic., 1857: Report of Commissioner of Crown Lands for 1856 to the Governor General of British North America. Page 36.

[50] *Ibid*. Pages 36-37.

[51] AO, Series RG 1-5-0-1, register of letters received by the Surveying Department relating to surveys, Reel MS7547, Page 237, No.3 of 1857.

[52] MNR Ontario Crown Survey Records, Instructions to Land Surveyors, Vol. 5, Page 294.

[53] Although the facts of the observations for latitude were recorded in the diaries for both Salter and Johnston, the record, and results, of those determinations were not included among the astronomic observations recorded in the field notes.

[54] This method was contrary to the original intention of the township survey system as outlined by PLS Salter in the exploration report of his 1855 work; which was to set township sidelines along meridian lines, thus making them narrower as they would be laid out northerly, thereby necessitating subsequent correction base lines. By running the range lines parallel to the principal meridian, as Salter and PLSs Donnelly, Molesworth and Herrick did, the tiers of townships would, nominally, be six miles wide throughout.

[55] MNR Ontario Crown Survey Records, Plan 1676, Map of part of the North Coast of Lake Huron and the River St. Mary shewing the Mineral Locations, surveyed and drawn by Alexander Vidal, 1847. The Cuthbertson Mining Location within which the Bruce Mines is located is shown. However, Salter's Range line actually intersected the north boundary of the Hincks Mineral Location, to the west of the west boundary of the Keating Mineral Location.

[56] Reserve No. 14 (Garden River) was surveyed by Charles Unwin, PLS from 11 September to 3 November 1852 under instructions issued to J.S. Dennis, PLS. (Marlatt 2004: 301).

[57] Reserve No. 15 (Batchewana) was partially surveyed by PLS J.W. Bridgland in 1853. However, the easterly or rear boundary was not surveyed; therefore, PLS Johnston would not have observed crossing into the Reserve with the third base line.

[58] Appendix 15(T) to Vol. 16, JLA, 21 Vic., 1858: A.P. Salter Final Report to Commissioner of Crown Lands relating to Survey of Base, Meridian, and Range Lines, North Shore of Lake Huron. Page 1. Also, AO, RG I, Series CB-1, Box 15, Reel MS924/10: Diary of A.P. Salter from 15 May to 31 December 1857. Pages 13-25. Also, Diary of James Johnston from 15 May 1857 to 20 January 1858, Pages 12-23. Also, MNR Ontario Crown Survey Records, FNB 1919, Pages 37-94.

[59] Reserve No. 12 (Thessalon) was surveyed by J.S. Dennis, PLS from 19 August to 10 September 1852. (Marlatt 2004: 303).

[60] MNR Ontario Crown Survey Records, FNB 1901, Diary, Field Notes, and Report from P.S. Donnelly to A.P. Salter, (sworn 4 February 1858). Also, Report, dated 15 January 1858, published in Report of the Commissioner of Crown Lands of the Province of Ontario for the year 1872.

[61] Donnelly Report dated 15 January 1858.

[62] As above per Note 39, the northerly 5.5 miles of the southerly principal meridian line run by PLS Herrick passed through the subsequently determined White Fish Lake First Nation unceded Reserve lands, No. 6 of the Robinson-Huron Treaty.

[63] MNR Ontario Crown Survey Records, FNB 1907, Diary, Field Notes, and Report from T.W. Herrick to A.P. Salter, (sworn 13 February 1858). Also, Report, dated 20 December 1857, published in Report of the Commissioner of Crown Lands of the Province of Ontario for the year 1872.

[64] Herrick Report dated 20 December 1857.

[65] MNR Ontario Crown Survey Records, FNB 1913, Diary, Field Notes, and Report from T.N. Molesworth to A.P. Salter, (sworn 12 December 1857). Also, Report, dated 3 December 1857, published in Report of the Commissioner of Crown Lands of the Province of Ontario for the year 1872.

[66] Molesworth Report dated 3 December 1857.

[67] MNR Ontario Crown Survey Records indicate receipt of Salter's plan relating to the Base, Range, and Meridian Line survey; however, the plan cannot be found in those records, and only the diaries for Mr. Salter and Mr. Johnston are recorded as having been forwarded to Ontario Archives. MNR information indicates the plan was prepared at a scale of 1 inch = 2 miles, and that the plan is 4.4 ft. x 12 ft. Ontario Archives report RG 1, SR6450, Accession 9760, Container N-5087, Barcode F006237; however, the plan appears to be a later compiled Department of Crown Lands Plan prepared from Salter's plan with prior and subsequent information added. Library and Archives Canada has copies of the latter plan and later compilations; however, the original plan is not recorded in those records.

[68] AO, Series RG 1-5-0-2, register of letters received by the Surveying Department relating to surveys, Reel MS7547, p. 581, No. 7.

[69] AO, Series RG 1-5-0-2, register of letters received by the Surveying Department relating to surveys, Reel MS7547, p. 581, No. 2.

[70] Salter Report dated 20 January 1858.

[71] Appendix 15 to Vol. 16, JLA, 21 Vic., 1858: Report of the Commissioner of Crown Lands, of Canada, for the year 1857. Page 59.

[72] LAC, Canada Gazette 1841-1869, Vol. 17, Number 16, 7 April 1858. Pages 676-677. Proclamation dated 12 April 1858, effective 1 May 1858, to create the Judicial Districts of Nipissing and Algoma, pursuant to 20 Vic., c. 60, 1857: *An Act to provide for the better Administration of Justice in the unorganized Tracts of Country within the Limits of this Province,* commonly known as *The Temporary Judicial Districts Act, 1857.*

[73] Indian Treaties and Surrenders, Vol. 1, No. 91A, Pages 227-228. Surrendered 9 June 1859, surrender accepted 22 July 1859.

[74] The described system of township survey became known as the Ontario 640-acre sectional system, Pattern 2, as described and illustrated in R.R.O. 1990, Reg. 1029: Survey Methods, Method 144, under the *Surveys Act*, R.S.O. 1990, c. S.30, s. 42(a). Per (Whitson 1906: 71), the one mile square sections of 640 acres "… are numbered from 1 to 36 beginning at northeast corner and continuing alternatively from east to west and from west to east, and are again divided into quarters and again into sixteenths or forty-acre lots."

[75] Pattern 3 is described and illustrated in R.R.O. 1990, Reg. 1029: Survey Methods, Method 118, under the *Surveys Act*, R.S.O. 1990, c. S.30, s. 37(1). Per (Whitson 1906: 70), "… a township six miles square, lots forty chains in front by eighty chains in depth, containing 320 acres or thereabouts, with single fronts, each concession containing twelve lots and each township six concessions."

[76] Adopted by Order-in-Council dated 24 April 1906 (Whitson 1906: 85). 1800 acre and 1200 acre sectional townships are described and illustrated in R.R.O. 1990, Reg. 1029: Survey Methods, Method 81, under the *Surveys Act*, R.S.O. 1990, c. S.30, s. 31(1). "Sectional township with double fronts" means a township divided into sections and lots and road allowances along each section boundary where the usual practice in the original survey was to survey the township boundaries, concession lines and side lines of sections defining section boundaries and to establish the front corners of the lots and the section corners.

[77] MNR Ontario Crown Survey Records, Instructions to Land Surveyors, Vol. 5, Pages 468-470.

[78] Statutes of Ontario, 1958, c. 107, s. 8. Assented to 27 March 1958.