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GRAVITY ANOMALIES IN THE GASPÉ PENINSULA, QUEBEC

BY

J. G. Tanner and R. J. Uffen

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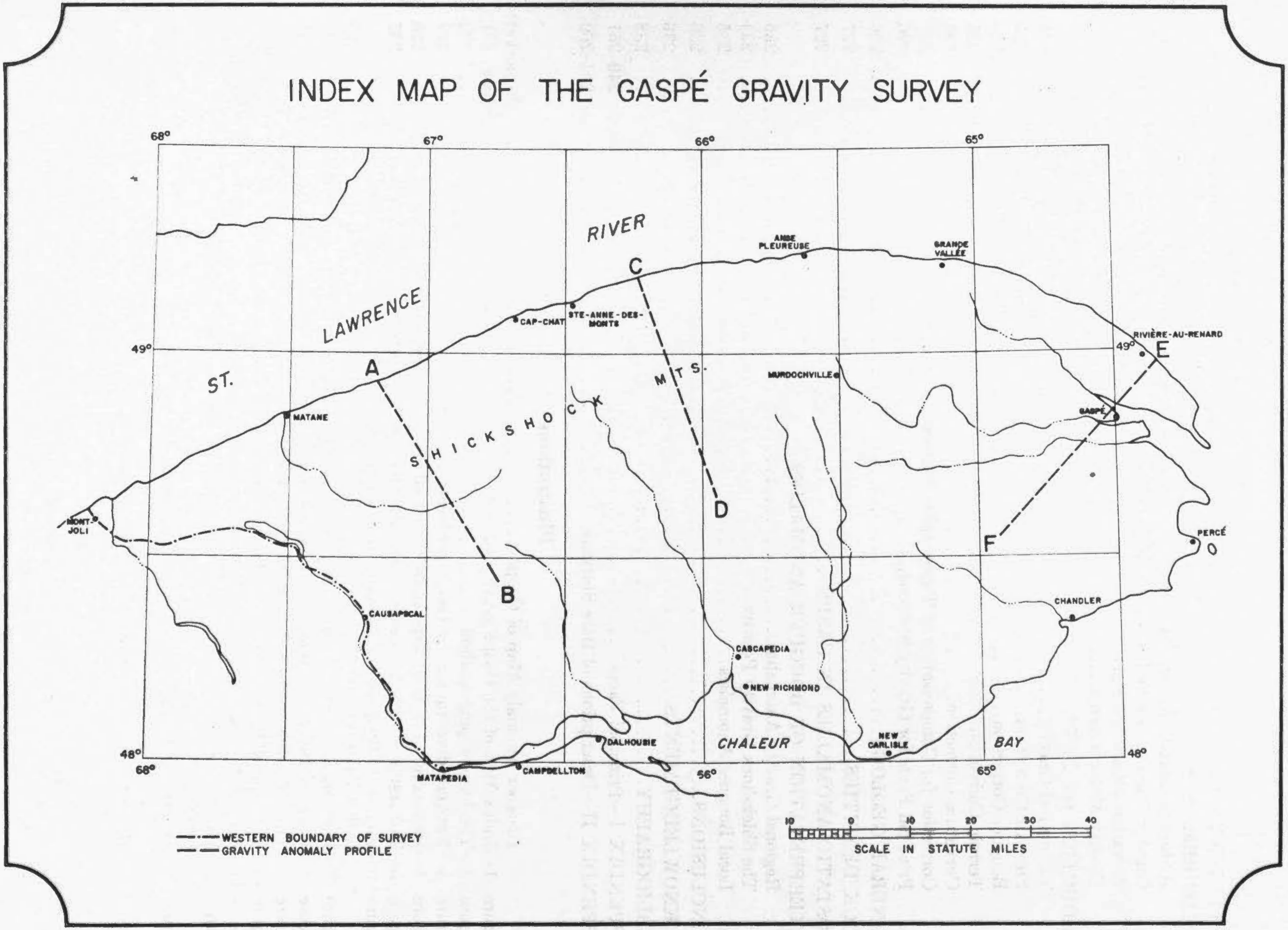
INDEX MAP OF THE GASPÉ GRAVITY SURVEY
68°
67°
66°
65°
49°
48°
56°
ST.
LAWRENCE
RIVER
SHICKSHOCK
MTS.
CHALEUR
BAY
A
B
C
D
E
F
MONT-JOLI
MATANE
CAP-CHAT
STE-ANNE-DES-MONTS
ANSE PLEUREUSE
GRANDE VALLÉE
RIVIÈRE-AU-RENARD
MURDOCHVILLE
GASPÉ
PERCÉ
CHANDLER
CAUSAPSCAL
CASCAPEDIA
NEW RICHMOND
NEW CARLISLE
DALHOUSIE
CAMPBELLTON
MATAPEDIA
WESTERN BOUNDARY OF SURVEY
GRAVITY ANOMALY PROFILE
10 0 10 20 30 40
SCALE IN STATUTE MILES

Figure 1.

Gravity Anomalies in the Gaspé Peninsula, Quebec

BY

J. G. TANNER AND R. J. UFFEN

ABSTRACT: Bouguer anomalies are presented for 600 gravity stations established in the Gaspé peninsula and isostatic anomalies computed for about 50 of these stations. The most outstanding feature of the gravity anomaly map is the positive gravity anomaly over the Shickshock Mountains. Calculations of the stress differences from the isostatic anomalies show that the earth's crust may be sufficiently strong to support the mountain chain without any isostatic compensation. However, analysis of the Bouguer anomalies suggests that the main structure associated with the Shickshock Mountains may be a horst, in which case the mass excess could give rise to subsequent movement in the fault zone. The regional Bouguer anomaly trends can be explained by a rotational fault zone which has disturbed the hypothetical "intermediate layer".

RÉSUMÉ: Les auteurs présentent la description des anomalies de Bouguer relevées à 600 stations de référence établies en Gaspésie. Pour une cinquantaine d'entre ces stations, ils ont mesuré les anomalies isostatiques. Le caractère le plus saillant de la carte gravimétrique est l'anomalie positive de la gravité, mesurée au-dessus des monts Shickshock. Il ressort des calculs des divergences causées par des contraintes dues aux anomalies isostatiques que l'écorce terrestre est peut-être assez solide pour supporter cette chaîne de montagnes sans aucun ajustement de l'équilibre isostatique. Cependant, l'étude des anomalies de Bouguer porte à croire que la principale structure associée aux Shickshocks est peut-être un horst; s'il en était ainsi, l'excédent de masse pourrait donner lieu à un mouvement subséquent au sein de la zone faillée. La prépondérance régionale des anomalies de Bouguer peut s'expliquer par la présence d'une zone de failles pivotantes qui a disloqué la «couche intermédiaire» hypothétique.

INTRODUCTION

The results for 600 gravimeter observations made by the Dominion Observatory in the Gaspé peninsula of Quebec (here regarded as the land east of the Matapedia-Mont Joli highway as shown in Figure 1) are presented together with an interpretation of the gravity anomalies in relation to the major geological features of the Gaspé peninsula.* The field work for this project was carried out by road traverses during the summer seasons of 1954, 1956, and 1957. These surveys are all interconnected and the principal facts for the stations and the description of base stations to which all other stations are referred are given in Appendices I and II respectively.

The gravity stations have been classified in three types: first order, second order, and third order, depending upon their accuracy. Since spirit level or transit elevations were sparse in some areas, it was necessary to use altimeters for approximately two-thirds of the stations. Consequently, the elevation values for the gravity stations have been classed as A, B, and C (Appendix II), depending upon their accuracy.

*A limited isostatic study is made here also. A complete analysis that will include computations of the deflections of the vertical for Quebec, including Gaspé, will be published separately.

The geological interpretation is based upon the Bouguer anomalies and the known surface geology. Density contrasts used in the interpretation were derived from density measurements made on rock samples collected in Gaspé during the field seasons.

MEASUREMENTS

History of Gravity Measurements in Gaspé

The first gravity measurement in Gaspé was made at Percé by F. A. McDiarmid in 1915 by means of pendulums. Subsequently, pendulum observations were carried out in 1930 by W. G. Hughson of the Dominion Observatory. The results of this survey along with several computations of the deflection of the vertical were published by Alcock and Miller in 1932. Other pendulum measurements (Matane, Gaspé village, and Matapedia) were made in 1946 and 1948 by M. J. S. Innes of the Dominion Observatory.

The first observations using a gravimeter were made in 1945 by A. H. Miller who established a series of stations around the perimeter of the peninsula with a Humble instrument. No further measurements were made until 1953 when G. D. Garland made a series of measurements along highway 6 between Matapedia and Cascapedia and along the Trans-Gaspésie highway north of Cascapedia for a distance of about 30 miles. The instrument then used was North American Gravimeter No. 85.

The writers' work began in 1954 and was continued in 1956 and 1957. Because of increased elevation data and because many of the gravity bases used in previous years had been destroyed, it was found advisable to repeat all the observations made prior to 1954. The recent work is summarized below.

1954: Observer: **R. J. Uffen**
Instrument: **North American Gravity Meter No. 85**
Number of Stations: **150**

This work consisted of—(a) First-order stations between Rivière-du-Loup and Mont Joli. (b) A road traverse between Anse Pleureuse, Murdochville, and Gaspé village. (c) A road traverse south from Ste. Anne-des-Monts along the Trans-Gaspésie highway. (d) A road traverse east from Causapscal along the Madawaska Pulp and Paper Company road. (e) A road traverse along the north shore of the St. Lawrence River.

Because of additional elevation data, traverses (c) and (d) were repeated in 1956 and 1957.

1956: Observer: **J. G. Tanner**
Instrument: **North American Gravity Meter No. 137**
Number of Stations: **416**

These observations include—(a) The primary base network from Mont Joli to Chatham, N.B., and around the perimeter of the Gaspé peninsula. (b) Numerous road traverses into the more accessible parts of the interior of Gaspé.

1957: Observer: **J. G. Tanner**
Instrument: **Worden Gravity Meter No. 44**
Number of Stations: **150**

This work consisted of road traverses by jeep into the more remote areas of Gaspé. Included in this work are—(a) Road traverses along the Hammermill Paper Company roads south of Ste. Félicité. (b) A road traverse from Mont Louis south to the top of Mount Jacques Cartier. (c) Road traverses westward from Gaspé village. (d) Road traverses north of Chandler. (e) Road traverses in the central part of Gaspé east and west of the Trans-Gaspésie highway. (f) Road traverses north of Escuminac.

The Gravity Observations and their Adjustment

Two types of gravity stations were established:
(a) First-order stations
(b) Second-order stations

(a) *The first-order stations* were established by the well known base looping method (Figure 2) and make up the primary base network. Thirty-eight of these stations were established in 1956. All bases established in 1954, 1956, and 1957 are described in Appendix II. The values of gravity are accurate to 1 x 10^{-4} gals.

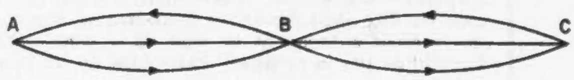

Figure 2. The base-looping method. A, B, and C are approximately one hour's drive apart.

(b) *Second-order stations* were established by road traverses out from first-order stations. Base readings were taken at intervals of 3 to 6 hours. The accuracy of the gravity values is 2 x 10^{-4} gals.

The primary base network as shown in Figure 3 is made up of a series of first-order stations between Quebec city airport and the Royal Canadian Air Force base at Chatham, New Brunswick, and a series of bases around the peninsula. The stations at Quebec city and Chatham form part of a primary network across Canada (Bancroft, 1959). The base stations between Quebec city and Mont Joli form part of the 1952 base network (Innes and Thompson, 1953). The adjustment was carried out by adopting primary network values at Quebec city and Chatham and adjusting the gravity differences of the first-order stations between them to agree with these values. A study of the field books showed that the instruments used in Gaspé behaved well (i.e. changes in readings due to drift were small) and that all loops were done in approximately the same length of time (3 hours per loop), and consequently it was decided to spread the residual linearly throughout the stations.

The series of stations around the peninsula required no adjustment since a summation of the

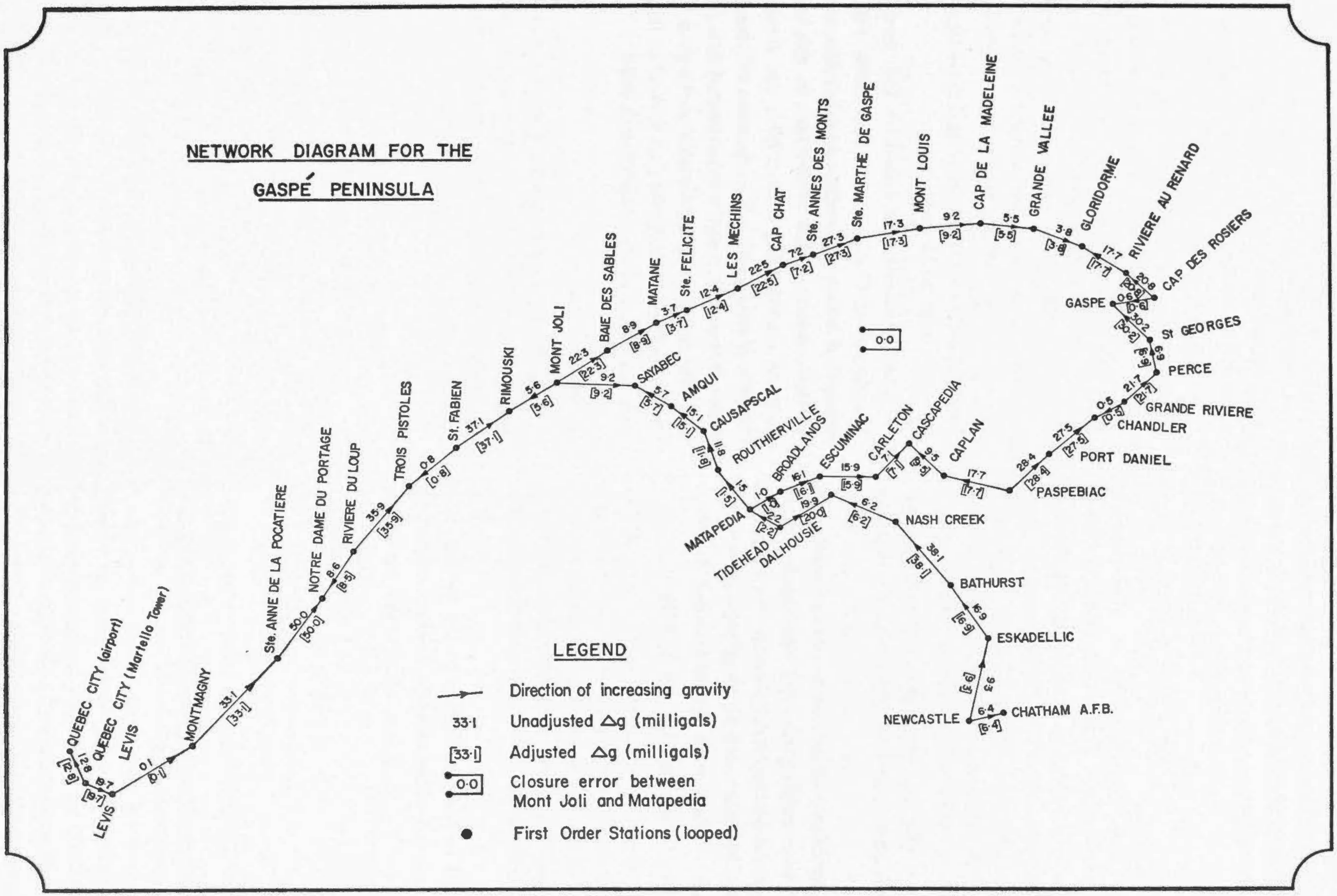
NETWORK DIAGRAM FOR THE
GASPÉ PENINSULA
LEGEND
Direction of increasing gravity
33·1 Unadjusted △g (milligals)
[33·1] Adjusted △g (milligals)
0·0 Closure error between Mont Joli and Matapedia
First Order Stations (looped)
QUEBEC CITY (airport)
QUEBEC CITY (Martello Tower)
LEVIS
LEVIS
MONTMAGNY
Ste. ANNE DE LA POCATIERE
NOTRE DAME DU PORTAGE
RIVIERE DU LOUP
TROIS PISTOLES
St. FABIEN
RIMOUSKI
MONT JOLI
BAIE DES SABLES
MATANE
Ste. FELICITE
LES MECHINS
CAP CHAT
Ste. ANNES DES MONTS
Ste. MARTHE DE GASPE
MONT LOUIS
CAP DE LA MADELEINE
GRANDE VALLEE
GLORIDORME
RIVIERE AU RENARD
CAP DES ROSIERS
GASPE
St GEORGES
PERCE
GRANDE RIVIERE
CHANDLER
PORT DANIEL
PASPEBIAC
CAPLAN
CASCAPEDIA
CARLETON
ESCUMINAC
BROADLANDS
ROUTHIERVILLE
CAUSAPSCAL
AMQUI
SAYABEC
MATAPEDIA
TIDEHEAD
DALHOUSIE
NASH CREEK
BATHURST
ESKADELLIC
NEWCASTLE
CHATHAM A.F.B.

Figure 3.

gravity differences yielded the same difference as the adjusted value between Mont Joli and Matapedia.

Second-order stations require no adjustment since their gravity values are referred to the adjusted values of the first-order stations.

Elevation Measurements

Wherever possible spirit level or trigonometric elevations were used. The source of these values was the Geodetic Survey of Canada, or the Surveys and Mapping Branch of the Department of Mines and Technical Surveys, Ottawa. It was necessary, however, to use altimeters for slightly less than two-thirds of the elevation values quoted in the principal facts of Appendix I. Three different methods, discussed below, were used to establish elevations by altimeter.

When elevation control was more than one hour's drive, the base looping method was used. More control over the atmospheric pressure variation can be exercised by this method, thus providing more reliable data. There were approximately 20 elevation determinations made by this technique.

In most instances elevation control was within one hour's drive and the procedure was to take single readings at the stations between the control points. Wherever possible these traverses were repeated. About 300 elevations were determined using this method.

The third technique, similar to the second, was necessary in areas where elevation values existed on the coastline only. In this case a traverse was made inland and single readings taken at each station. The traverse was repeated on another day in an attempt to reduce the effect of atmospheric pressure variations. The looping method could also have been used, but was found to be too time-consuming. Approximately 50 stations were established by this method.

Because a variety of sources and methods were used for elevations, it is felt that some attempt should be made to classify these stations as A, B, or C depending upon the accuracy.

The class A elevations are those established by standard surveying techniques. Included in these are a series of bench marks established by the Dominion Observatory in 1957 south of Ste. Félicité. The instrument used was a Zeiss Opton II level. Class A stations may be in error by as much as 5 feet.

In general, class B stations are those which were established by the first two methods described above. In one instance a reversal of the atmospheric pressure variation was suspected but the readings could not be repeated because of poor road conditions. Consequently these were not included in the class B stations. Some traverses included several spirit level elevations, and re-computation omitting some of the known values indicated the class B stations may have errors as large as 15 feet.

The elevations established by the third method are classed as C stations. Since there is no inland control, it is very difficult to estimate the magnitude of the errors. A line of stations of this class was re-done in 1957 using a spirit level and a comparison of these results yielded discrepancies varying between 4 and 35 feet. A rough comparison with topographic contour maps gave differences as large as 40 feet. It is therefore considered that errors as large as 40 feet may exist in the class C elevations.

Density Measurements

All density measurements were made in the field using a rugged field balance that measured accurately to the nearest gram. Using the relationship

$$\frac{\Delta \rho}{\rho} = \frac{\Delta M}{M}$$

where ρ = density in gm/cc.
and M = mass of sample in grams,

it is seen that in order to determine the density accurately to 0.01 gm/cc. for samples having a density as high as 3.0 gm/cc. an accuracy of 1 part in 300 must be maintained. Of the samples collected only 10 weighed less than 300 grams, all of which were measured to the nearest tenth of a gram.

The mean density of all the rocks collected in Gaspé was 2.63 gm/cc. and the standard deviation of the mean density was ± 0.01 gm/cc. A summary of the results from density determinations is given in Table I.

TABLE I

Densities of Rocks in the Gaspé Peninsula

Classification (*After McGerrigle, 1953*)	Rock Nature	No. of Samples	Mean Density	Standard Deviation
			gm/cc.	gm/cc.
Carboniferous	Mainly coarse, clastic red beds	12	2.61	0.03
Devonian	Sandstones	52	2.59	0.03
	Limestones	45	2.61	0.03
Silurian	Undivided	20	2.64	0.01
Ordovician	Shales, slate, grey rock and limestone	154	2.60	0.01
Pre-Ordovician(?)	Maquereau group	12	2.71	0.01
	Shickshock series (altered basic lavas)	16	3.02	0.03
Intrusive Rocks	Granite	8	2.60	0.02
	Serpentinite and peridotite	50	2.55—3.34	—

REDUCTION OF DATA

Theoretical Gravity

The latitude of each station was scaled from maps published by the Surveys and Mapping Branch, Department of Mines and Technical Surveys, Ottawa, on the scale of 1: 50,000. The theoretical value of gravity was determined from the tables computed by the United States Coast and Geodetic Survey (Swick, 1942). These tables are based on the International Ellipsoid adopted in 1930.

Free-Air Correction

This correction for elevation is also based on the International Ellipsoid. The value 0.09406 milligals per foot was used to make this correction. Because they are very small, second-order corrections which vary with elevation and latitude have been neglected.

Bouguer Correction

The conventional value of 2.67 gm/cc. was used for this correction. The measurements from samples gave a mean value of 2.63 gm/cc. The discrepancy involved in using the conventional density is only 0.52 milligals per 1,000 feet and since most of the station elevations were less than 1,000 feet, the errors introduced were of no consequence for the purpose of geological interpretation of gravity anomalies.

Terrain Correction

This correction, which takes into account the departure of the earth's surface from the assumption of an infinite plane, was made on the basis of the Hayford-Bowie system (1912) and was carried out to zone O. Since the application of this correction is very time-consuming, it was decided to apply it to a selected number of stations (52 in all) in order to estimate the errors which would be caused by neglecting this factor. From Figure 4 it is seen that about 95 per cent of the stations have a terrain correction of 5 milligals or less, and that nearly 60 per cent have a correction of 1 milligal or less. It is

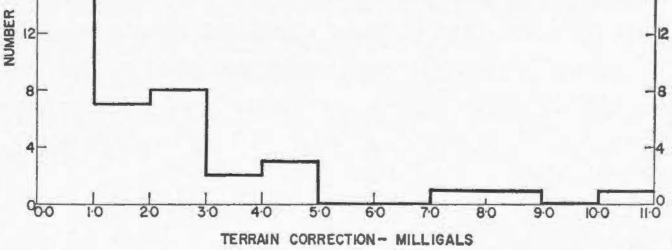

Figure 4. Histogram of terrain corrections computed for 52 gravity stations in Gaspé.

concluded from these results that the regional Bouguer anomaly map (in pocket) has not been seriously affected by neglecting the effect of terrain. On the other hand it is evident that the corrections are sufficiently large in some cases to warrant their consideration in the interpretation. Consequently all gravity profiles used for the interpretation have been corrected for terrain.

Curvature Correction

As is the case in the topographic corrections this factor has been neglected on the Bouguer anomaly map since, with the exception of a few stations, the correction is 0.75 milligals or less (Swick, 1942) and is opposite in sign to the topographic correction. It has, however, been included in all gravity profiles and in the reduction of the isostatic anomalies.

Correction for Compensation of Topographic Features

This factor is used in the reduction of the isostatic anomalies. Because it is more geologically reasonable, the correction was based on the Airy hypothesis using tables provided by Heiskanen (1938). The effect of compensation was calculated for thicknesses of the crust of 20, 30, 40, and 60 kilometres respectively.

Principal Facts for Gravity Stations

The principal facts for all the gravity stations used on the Bouguer anomaly map are given in Appendix II. The free-air and Bouguer anomalies are quoted for all stations. While the free-air anomaly is not used in this report, it is included here because of its usefulness in geodetic work. The isostatic anomalies may be found in Table II, on page 229.

All values have been quoted to the tenth milligal. It is very difficult to assess the accuracy of the anomaly values quoted because many of the corrections have not been computed for all the stations. It is believed that in most cases the errors are less than 2 milligals. In some instances, such as stations with class C elevations, and with large terrain corrections, errors may be as great as 5 milligals or more.

GENERAL GEOLOGY

The Gaspé peninsula lies along the northern margin of the Appalachian Mountain system in Eastern Canada. North of the peninsula the system is separated from the Precambrian rocks of the Canadian Shield by an inferred thrust fault known as Logan's line. East of Gaspé, Palaeozoic rocks continue under the Gulf of St. Lawrence and reappear in Newfoundland. Other Palaeozoic rocks of the Appalachian system outcrop in the Atlantic Provinces to the southeast of Gaspé.

The rocks in Gaspé range in age from possibly pre-Ordovician (Precambrian of Cambrian) to Carboniferous. In general, they are composed mainly of sedimentary rocks with varying amounts of volcanic rock which have been intruded by granite, gabbro, and peridotite. The surface area of the intrusive rocks is very small.

Of most importance to this work are the rocks of the Shickshock series which are described in some detail here. Until recently the term "Shickshock series" has remained undefined in the literature. McGerrigle (1954) states that the "Shickshock series includes all the rocks of the Shickshock range with the exception of the intrusive serpentine and granite bodies toward the eastern end of the range". These rocks are mainly hornblende-chlorite-epidote schist (altered basic volcanic rocks) with subordinate sedimentary rocks.

There has been controversy concerning the age of the Shickshock series. Alcock (1926) was of the opinion that these rocks might be Middle Ordovician in age and that they appear to overlie the Lower Ordovician rocks to the north in a normal anticlinal sequence. Although we know of no recent literature supporting this view, it appears that this concept is held by many geologists. McGerrigle (1954) was impressed by the much higher degree of metamorphism exhibited in the rocks of the Shickshock series than in those of the Ordovician, the apparent cutting off of structures within the Shickshock series at the northern contact, and the fact that overturning on a small scale in the bordering Ordovician rocks suggests that the Shickshock rocks were superimposed upon the Ordovician. In view of this, McGerrigle suggested that the lavas and sediments of the Shickshock series are pre-Ordovician and that the northern boundary may be a high-angle thrust fault.

Descriptions of other rock types will be given as needed, in the section concerning interpretation of the Bouguer anomalies.

The structural trends generally parallel the north shoreline of the Gaspé peninsula. In the west the structure strikes east-northeast, gradually changing to east-west in central Gaspé. Finally, the strike is approximately east-southeast in eastern Gaspé. The structures found in Gaspé are of two general characters (McGerrigle, 1950). The Ordovician and older rocks have been severely folded, show strong cleavage, and severe local crumpling. The Silurian and later rocks, on the other hand, are much more gently folded and have weakly developed cleavage. Because of these differences it is believed that two orogenies have taken place; the Taconic orogeny in Ordovician time and the Acadian or Shickshockian orogeny in the Devonian period. The Carboniferous rocks in Gaspé are flat-lying or very gently dipping, indicating that the Appalachian orogeny of Permian time, whose effects are prominent in the southern Appalachians, has not affected the Gaspé peninsula (Alcock, 1935).

ROCK DENSITIES

Table I lists the results of density measurements made on the rock samples collected during the course of the field work.

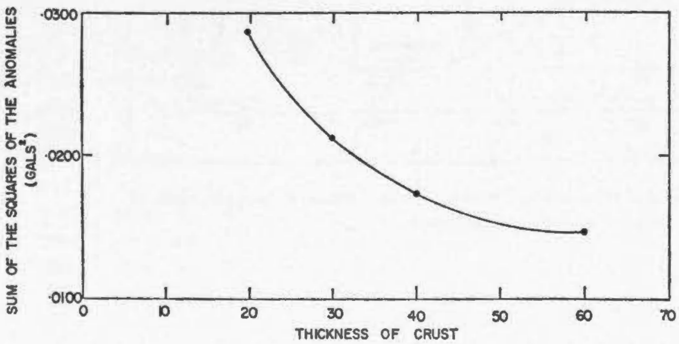

Figure 5. The results of the Σ (isostatic anomaly)^2 method applied to Gaspé.

Unfortunately no samples of the ultrabasic rocks in Gaspé could be obtained. However, C. H. Smith of the Geological Survey of Canada has made a number of density measurements on the ultrabasic rocks in the Mount Albert area. These results are listed in Table I. No attempt was made to establish a mean density because the samples ranged from serpentinite to peridotite. For the purpose of interpretation of the Bouguer anomalies a density of 3.25 gm/cc. for peridotite has been adopted.

It is very difficult to decide if the mean densities in Table I are representative. The density for the lavas of the Shickshock series is unusually high, but samples were taken at various locations along its length and the densities were all uniformly high. The high density is probably the result of metamorphism of a normal basalt to hornblende grade, thus increasing the density. It is believed that the mean density given for the Ordovician rocks may not be representative because shale outcrops, particularly in the Ordovician to the north, were badly weathered and broken up, making sampling very difficult.

ISOSTATIC ANOMALIES IN GASPÉ

As has been previously mentioned, the isostatic anomalies have been computed using the Airy theory of isostasy for crustal thicknesses of 20, 30, 40, and 60 kilometres respectively. The anomalies for each station are given in Table II. The crustal thickness adopted on the isostatic map (Figure 7) was arbitrary. The Σ (isostatic anomaly)^2 method* (Figure 5) gives a crustal thickness that is in excess of 60 kilometres. Seismic studies by Tatel, Tuve, et al. (1952) over the Appalachians in the United States indicate that the crustal thickness is only about 40 kilometres or less. In addition, it has been argued by Tsuboi (1950) that for any area not in isostatic equilibrium the method using isostotic anomalies to determine crustal thickness breaks down. Since it is possible that Gaspé is not generally in a state of isostatic equilibrium, and in view of the work in the United States, a crustal thickness of 40 kilometres has been adopted.

Figure 6 is a very interesting example of the two extremes that may be encountered in isostatic studies. The portion of the profile north of the St. Lawrence River, taken from Innes (1957), contains a large gravity low over an area in which there is no corresponding positive topographic feature. Innes concluded that the feature can be supported by the strength of the earth's crust. In Gaspé, on the other hand, there is the unusual occurrence of a gravity positive over mountains. To explain this it is necessary to calculate the stress differences arising from such a feature. According to Jeffreys (1952) the stress difference for an unsupported topographic feature to rectangular cross section is

$$S = \tfrac{1}{2}\, g\, \rho\, h \text{ dynes per cm.}^2 \qquad (1)$$

*The isostatic anomalies are squared and then summed for each thickness included in the solution. Ideally, the curve resulting from a plot of these results should resemble a hanging rope, in which case the crustal thickness should be in the vicinity of the minimum point on the curve. Because of the presence of large positive anomalies no minimum is reached in this solution.

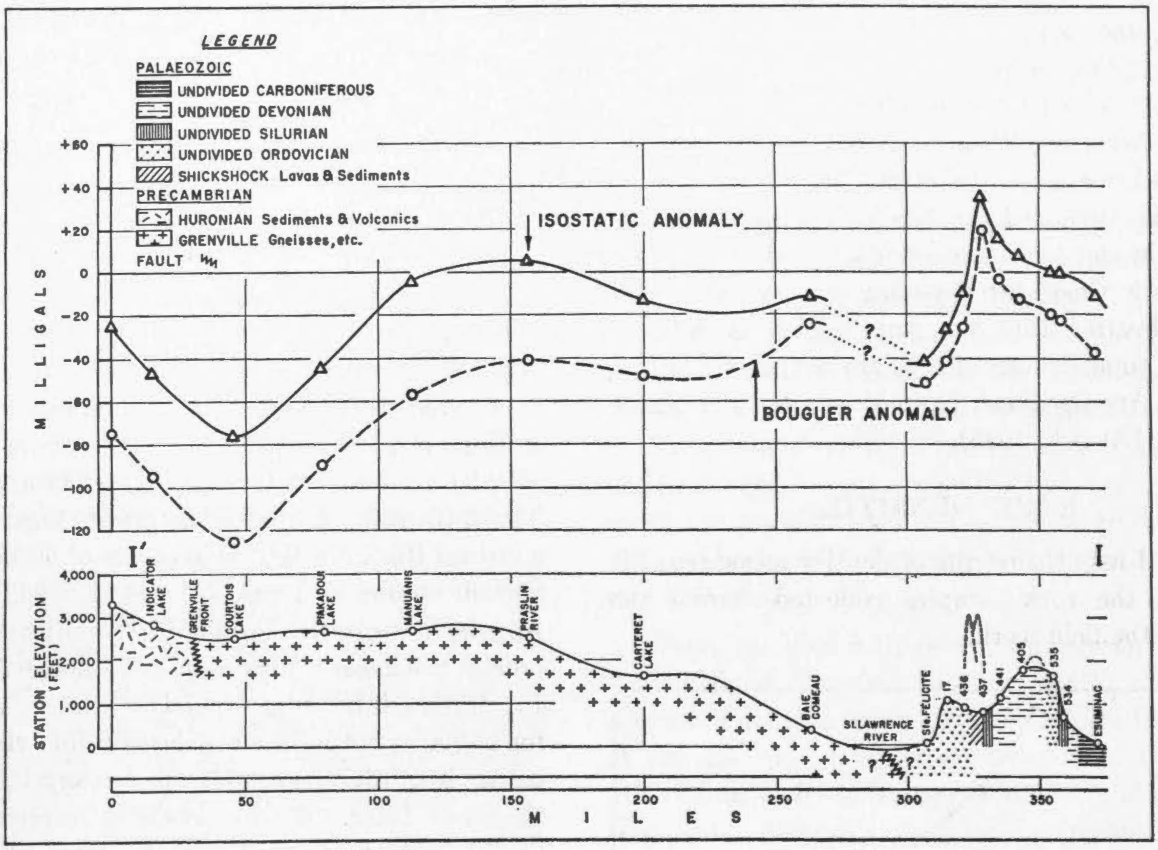

Figure 6. Combined Bouguer and isostatic anomaly profile across the Precambrian Shield and the folded Palaeozoic rocks of Gaspé. The Bouguer anomaly itself, is sufficient to illustrate the lack of isostatic compensation.

ISOSTATIC ANOMALY MAP OF GASPE
(Based on Airy Hypothesis)
Thickness of Crust = 40 kms.

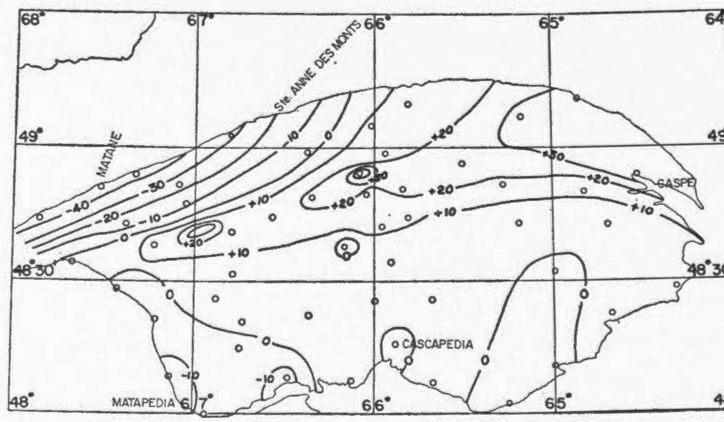

Figure 7.

TABLE II

Isostatic Anomalies in the Gaspé Peninsula

Station No.	Station Name	Elevation Ft.	Bouguer Anomaly in Gals.	Isostatic Anomalies Airy 20 km.	30 km.	40 km.	60 km.
				gals.	gals.	gals.	gals.
1	Baie des Sables	14	−0.0521	−0.0449	−0.0435	−0.0423	−0.0412
3	Matane	35	−0.0523	−0.0450	−0.0440	−0.0427	−0.0421
4	Ste. Félicité	51	−0.0524	−0.0440	−0.0429	−0.0419	−0.0416
17	St. Jean de Cherbourg	1040	−0.0421	−0.0212	−0.0247	−0.0270	−0.0299
49		1945	−0.0062	0.0228	0.0153	0.0111	0.0061
57	Mon. No. 262	216	−0.0069	0.0185	0.0144	0.0120	0.0085
69	Cloridorme	54	0.0280	0.0328	0.0313	0.0313	0.0299
78	Ste. Marjorique	141	0.0302	0.0393	0.0366	0.0348	0.0318
120		196	0.0166	0.0372	0.0327	0.0304	0.0268
150	Cap Chat	10	−0.0467	−0.0338	−0.0341	−0.0344	−0.0357
U-151		1396	0.0007	0.0298	0.0222	0.0168	0.0098
U-154	Gaspé Copper	1876	0.0097	0.0380	0.0320	0.0265	0.0191
168	Sayabec	554	−0.0179	0.0014	−0.0013	−0.0028	−0.0050
169	Amqui	546	−0.0154	0.0071	0.0042	0.0020	−0.0009
170	Causapscal	482	−0.0242	0.0005	−0.0022	−0.0048	−0.0093
172	Matapedia	54	−0.0291	−0.0081	−0.0085	−0.0098	−0.0136
181	Escuminac	19	−0.0273	−0.0106	−0.0108	−0.0116	−0.0138
193	Carleton	54	−0.0087	0.0038	0.0039	0.0026	0.0005
194	Cascapedia	38	−0.0148	−0.0010	−0.0012	−0.0023	−0.0053
195	Caplan	88	−0.0081	0.0013	0.0014	0.0010	−0.0017
196	Paspebiac	189	−0.0111	−0.0059	−0.0060	−0.0065	−0.0081
197	Port Daniel	10	−0.0089	−0.0025	−0.0033	−0.0039	−0.0070
201	Mon. No. 368	318	0.0006	0.0077	0.0062	0.0045	0.0018
224	Perce Stn	101	0.0032	0.0056	0.0046	0.0036	0.0012
252	Mon. No. 302	223	0.0026	0.0199	0.0158	0.0127	0.0090
330	B.M. M-25	542	−0.0213	0.0072	0.0010	−0.0028	−0.0078
337	B.M. M-22	903	0.0129	0.0558	0.0469	0.0400	0.0330
347		482	−0.0236	0.0064	0.0016	−0.0023	−0.0079
354	Mon. No. 240	146	−0.0133	0.0102	0.0084	0.0053	0.0002
389	Milnikek	232	−0.0336	−0.0070	−0.0095	−0.0121	−0.0160
401	B.M. M-4	1357	−0.0155	0.0122	0.0077	0.0043	−0.0006
405	B.M. M-6	1755	−0.0129	0.0163	0.0113	0.0073	0.0016
416		178	−0.0290	−0.0106	−0.0125	−0.0136	−0.0161
436	Hammermill Barrier	835	−0.0264	−0.0030	−0.0076	−0.0104	−0.0136
441		1095	−0.0042	0.0253	0.0192	0.0152	0.0100
462		4169	−0.0099	0.0333	0.0248	0.0177	0.0125
470	Mon. No. 315	2072	0.0063	0.0420	0.0333	0.0277	0.0197
475		789	−0.0031	0.0130	0.0096	0.0056	0.0026
485		781	−0.0134	0.0157	0.0092	0.0046	−0.0020
493		1357	−0.0157	0.0062	0.0000	−0.0037	−0.0095
503		450	−0.0142	0.0097	0.0064	0.0035	−0.0013
510		955	−0.0138	0.0261	0.0182	0.0118	0.0040
515		1323	−0.0065	0.0270	0.0194	0.0140	0.0060
520	Lac Ste. Anne	1297	−0.0071	0.0299	0.0204	0.0150	0.0080
524		568	−0.0160	0.0155	0.0107	0.0066	0.0007
533		1465	−0.0135	0.0127	0.0085	0.0055	0.0004
534		642	−0.0232	0.0050	0.0018	−0.0009	−0.0052
535		1617	−0.0191	0.0091	0.0043	0.0007	−0.0043
560		1629	−0.0047	0.0293	0.0225	0.0178	0.0107
565		961	0.0000	0.0325	0.0253	0.0204	0.0141
575		414	−0.0019	0.0223	0.0187	0.0167	0.0133

Assuming a height (h) of 1 kilometre for the Shickshock Mountains, a mean density (ρ) of 2.7 gm/cc. and 980 gals as the value of gravity (g), the stress difference would be about 1.3 x 10^8 dynes per $cm.^2$ This figure may be checked roughly by obtaining an expression for ρh from the formula for the attraction of an infinite sheet. ($\Delta g = 2\pi G\rho h$) Equation (1) now becomes

$$S = \frac{g\,\Delta\,g}{4\,\pi\,G} \text{ dynes per cm}^2. \qquad (2)$$

Taking g as 0.070 gals from Figure 7, the stress difference is approximately 10^8 dynes per $cm.^2$ If this load is to be supported by the earth's crust the strength required must be available at a depth approximately equal to one-half the width of the strip, which in this case is about 15 miles.

Jeffreys (1952) states that the crust can support stress differences of 1.5 x 10^9 dynes per $cm.^2$ at depths down to 30 miles. Assuming this figure to be correct, it is seen that the earth's crust could support such a feature without any accompanying isostatic compensation. It is necessary, however, to qualify this statement somewhat for the situation in Gaspé. The southern limit of the Shickshock range appears to be faulted (Alcock, 1926) and it is possible that the northern limit may also be faulted (McGerrigle, 1954). In view of this the load the crust could support would be considerably less, depending on the nature of the fault. It is therefore conceivable, if faulting exists on both fronts, that movement could take place along them. J. H. Hodgson of the Seismology Division advises that recent faulting has occurred in the general area. A preliminary epicentral determination of an earthquake in 1952, however, places the focus under the St. Lawrence River.

The isostatic map is very interesting in that the southern half of Gaspé seems to be in isostatic equilibrium whereas the northern half shows that isostatic adjustment has not been attained. The northwest part is typical of uncompensated continental regions whereas the northeast part seems to typify uncompensated ocean areas. A possible cause of these features is given in a later section.

INTERPRETATION OF BOUGUER ANOMALIES

Regional Gravity Anomalies

The most striking features of the gravity anomaly map of Gaspé (in pocket) are the steep gradients, the gravity positive over the Shickshock Mountains, and the variation of the anomalies along the strike. Not only do the anomalies increase in magnitude from west to east along strike, but also they increase much more along the north shore than in the central and southern parts of the peninsula. Near the town of Matane on the north shore the Bouguer anomaly is about -50 milligals. Eastward along the shoreline the anomalies steadily increase until a maximum of about 30 milligals is observed near the eastern end of the peninsula. In central and southern Gaspé there is only a 30-milligal increase from west to east. The steepest Bouguer anomaly gradient occurs in the western end of the peninsula where it increases by 80 milligals between the St. Lawrence River and the Shickshock Mountains. The gradient, 4 milligals per mile, is one of the steepest recorded in Canada. While this gradient is in itself remarkable, it is made all the more so because the anomalies are positive over a mountain range. These features combined make the anomaly trends in Gaspé very striking indeed.

Elsewhere (Figure 8) the gravity anomalies are generally lower than those observed in Gaspé. North of the St. Lawrence River over the Precambrian Shield the Bouguer anomalies are negative, but become less negative southward. One interesting feature is the gravity "high" near the town of Sept Îles. This is probably caused by basic rocks which have intruded the gneissic rocks of the area. Westward the positive anomalies found in Gaspé become negative with a magnitude comparable to those over the Shield area. To the south, in New Brunswick, the gravity anomalies vary between ± 20 milligals.

The following section is concerned with the increase in the Bouguer anomaly along strike and in regional changes in a north-south direction. The analysis was made by studying profiles across

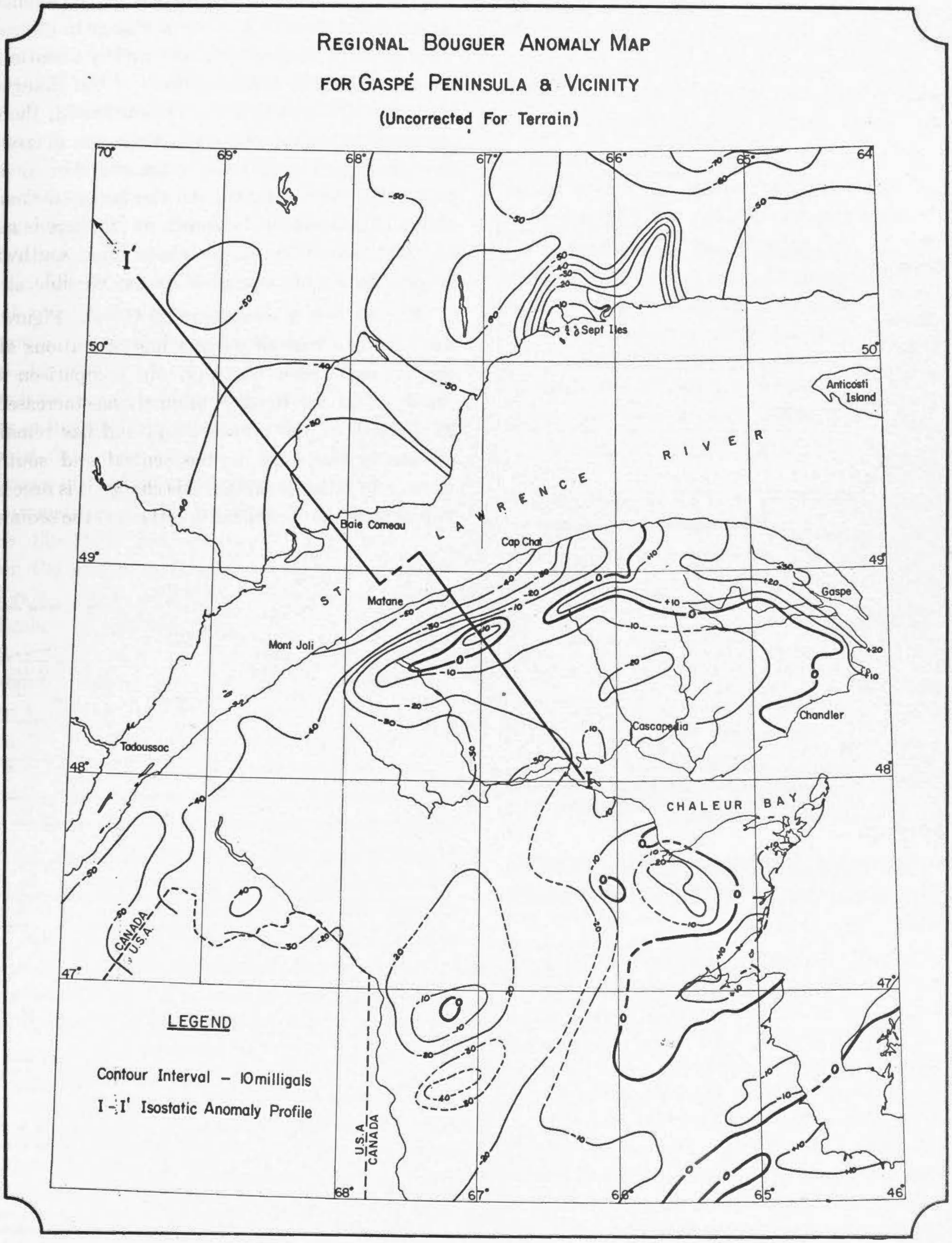
REGIONAL BOUGUER ANOMALY MAP
FOR GASPÉ PENINSULA & VICINITY
(Uncorrected For Terrain)
Sept Iles
Anticosti Island
ST. LAWRENCE RIVER
Baie Comeau
Cap Chat
Matane
Mont Joli
Gaspe
Tadoussac
Cascapedia
Chandler
CHALEUR BAY
CANADA
U.S.A.
LEGEND
Contour Interval – 10 milligals
I – I' Isostatic Anomaly Profile

Figure 8.

strike and for purposes of calculation the structures were assumed to be infinite in strike. The location of the profiles is given in Figure 1. The density values of Table I were used with the exception of

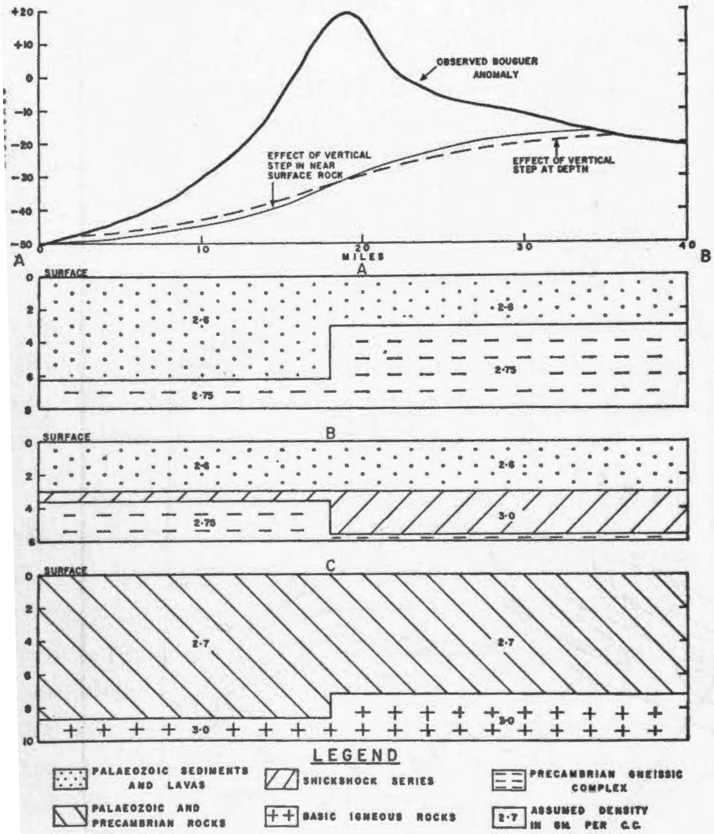

Figure 9. Three possible explanations of the regional anomaly trend in the profile A—B, (A) thinning sediments, (B) thickening lavas, or (C) a vertical step at depth. The depth to the basic layer in (C) is arbitrary due to ambiguity in interpreting gravity anomalies.

that for the Precambrian which has been adopted from unpublished density measurements in nearby areas where these rocks are exposed.

The gravity anomaly trend in profile A—B (Figure 9) consists of a regional increase southward and a local positive anomaly over the Shickshock Mountains. Figure 9 also shows three possible mass distributions which could account for the regional increase southward of approximately 35 milligals. The assumed density for the lower layer (ρ = 3.0 gm/cc.) shown in part C is based on a tentative identification of this layer with the "intermediate or basaltic layer" of seismology (Jeffreys, 1952). The reality of such a layer is questionable and it has been introduced here as a hypothesis which simplifies the computations.* The anomalies are explained here by an abrupt change in thickness. They could be explained equally well by a continuous change, but since the magnitude of the changes in thickness is the point to be demonstrated, the diagram will serve the purpose. From the diagram it is seen that either (a) the sediments thin by over 16,000 feet to the south, (b) the lavas thicken by about 10,000 feet to the south, or (c) there is a rise of 9,000 feet in the intermediate layer southward. A combination of these is, of course, possible.

Farther east a second profile C—D, (Figure 10) has been constructed using a line of stations along the Trans-Gaspésie highway. In comparison with profile A—B, the Bouguer anomaly has increased by 25 milligals at the northern end and has remained essentially the same in the central and southern parts. In order to explain this change it is necessary to postulate that to the north either (a) the sediments

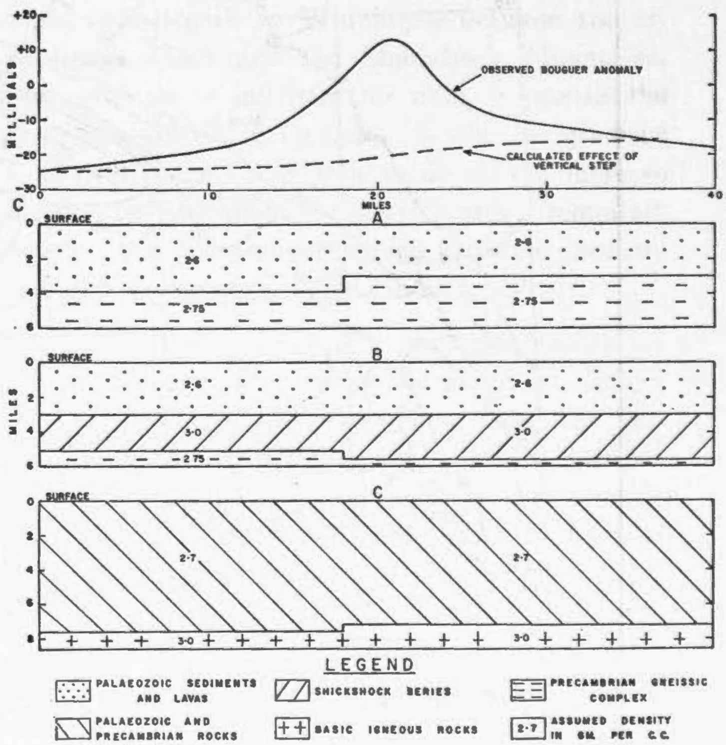

Figure 10. Three possible explanations of the regional trend in profile C—D. The depth to the basic layer in part (C) is based upon that assumed for Figure 9.

*This statement might be qualified by noting that there may be a general increase of basic material downwards, in which case it would be necessary to introduce the layer concept for purposes of computation. In addition, it is quite possible that the rocks at depth in and around Gaspé are more basic than elsewhere, and hence the term "layer" is not used in a continental sense.

have thinned by about 12,000 feet along strike, (b) the lavas have thickened by 7,500 feet, or (c) the north side of the intermediate layer has risen by about 7,000 feet. In the central and southern sections of the profile the structure is unchanged.

Two or three lines of evidence would suggest that variation of the thickness of sediments could not cause the observed anomaly change except for minor effects which will be discussed subsequently. First, Ordovician rocks are exposed in the northern part of the profile and Silurian and Devonian rocks which overlie the Ordovician rocks are exposed to the south. Consequently, the thickness of sediments would be expected to be greater to the south, since there is no reason to suppose that the Ordovician and older sediments thin to the south. Secondly, the gravity data also suggest that variation in the thickness of sediments plays little part in explaining the anomaly trend. If the trend over the Precambrian Shield is projected across the St. Lawrence River the anomaly value obtained is about −20 milligals. However, the observed value is −50 milligals. Using this difference and a density contrast of 0.15 gm/cc. and assuming that the sudden change is caused by the sediments, it is found that there would have to be 15,000 feet* of sediments present. Thus, the total thickness of sediments in the northern part of profile A—B would, at best, be equal to the decrease southward in thickness of sediments necessary to explain the observed regional anomaly change in the profile. The implications of such an interpretation are obvious, and it is very improbable. It is also evident from the gravity data that thinning sediments eastward cannot explain the large Bouguer anomaly increase eastward in northern Gaspé. The total anomaly change from west to east is 80 milligals and would require the sediments to thin by about 40,000 feet eastward in order to account for this change. In view of the large variations in the thickness of sediments necessary to explain all or part of the regional anomaly changes, it is concluded that the sediments play little, if any, role in explaining the regional trends.

*This figure was obtained from the formula for the attraction of an infinite sheet ($\Delta g = 2\pi G\rho h$). If the width of a body is several times greater than the thickness, this equation gives sufficiently accurate results.

It is equally difficult, on the basis of the present information, to conceive of the lavas thickening by 7,500 feet to the north and remaining unchanged to the south. In order to explain the entire increase from east to west, the total change in thickness would have to be greater than 20,000 feet. In view of this it is concluded that such a phenomenon is very unlikely and that thickening lava beds eastward cannot explain the regional anomaly trend.

A third profile, E—F (Figure 11) has been constructed from a road traverse across the eastern part of the peninsula. Two general observations may be made by way of comparison with profile C—D. First, there has been a general rise of about 10 milligals throughout the whole profile. Secondly, there has been a very large Bouguer anomaly increase in the northern part of the profile. The

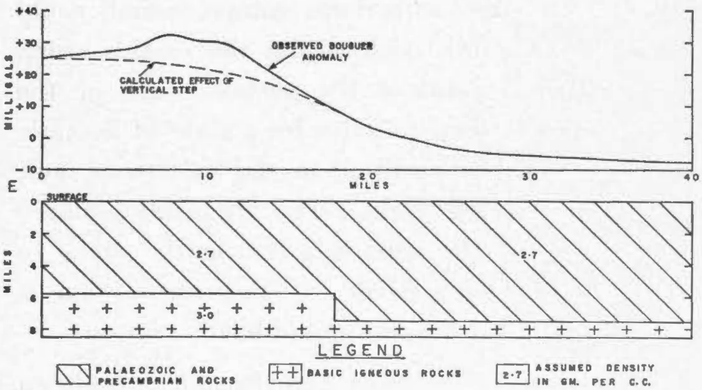

Figure 11. A possible cause of the regional anomaly trend of profile E—F. The depth to the basic layer is based upon that assumed in Figure 9.

former could be due to regional changes either at the surface or at depth or some combination of the two, and with the information at hand it is very difficult to decide upon the cause. Having eliminated the sedimentary rocks and dense lavas as probable causes of the regional anomalies, the attitude of the vertical step in the "intermediate layer" must be investigated to explain the observed phenomena along profile E—F. From Figure 11 it is seen that the north side of the step would be higher than the south by about 9,000 feet. Compared with profile A—B (Figure 9), the step is completely reversed. If the structure were as simple as shown here this would imply a high-angle rotational fault zone. However, it is conceivable that crustal warping could result in a similar Bouguer anomaly pattern.

Summarizing briefly, the above interpretation would have the following features, (a) the north side of the step would rise toward the surface of the earth, —the total rise from west to east is approximately 18,000 feet,—and (b) the south side would be essentially flat or would rise slightly to account for the slight regional increase. Such a mass distribution could come about if it were assumed that the "intermediate layer" had an attitude similar to that of the north side of the step (i.e. rising eastward). The result of this mass distribution would give rise to an isostatic anomaly pattern similar to that in northern Gaspé (Figure 7), at present. The large negative isostatic anomalies to the west imply a lack of mass and the positive anomalies to the east imply an excess of mass. This would result in a tendency for the west end to rise and the east end to sink. Subsequent stresses, perhaps compressional, could levelop a fracture deep within the earth's crust. Jnder these conditions the portion south of the racture would tend to strive for a state of isostatic quilibrium, thus resulting in the rotational fault one as postulated herein. This argument assumes, f course, that the crust was sufficiently strong to ehave as a rigid block. If this assumption is ncorrect, crustal warping would have occurred.

The trend of generally high Bouguer anoaliesm ontinues west of the western boundary of the area r a short distance and disappears. Positive Bouuer anomalies are not observed again for quite some istance westward in the Eastern Townships (Thompon and Garland, 1957). The disappearance of ositive gravity anomalies west of Gaspé could be xplained by a fault zone striking northwest which its off the rotational fault zone. It is conceivable at this fault may also be a product of the same ocess which produced the postulated rotational ult. Such a fault would explain the northwestutheast trends in the gravity anomalies in the southestern part of Gaspé. The east side of the fault ould be the uplift side.

The curved trace of the fault could well be conolled by the shape of the Precambrian foreland. seems quite reasonable to assume that, if the outline of the Precambrian Shield were arcuate, any marginal faults would exhibit a similar trend.

The Shickshock Gravity Positive

The gravity profiles (i.e. residual Bouguer anomaly profiles) shown in Figure 12 are those of Figures 9 and 10 with the regional trends removed. The gravitational effect of the hypothetical structures has been computed by means of a gravity computation chart and assumes that these structures are infinite in strike.

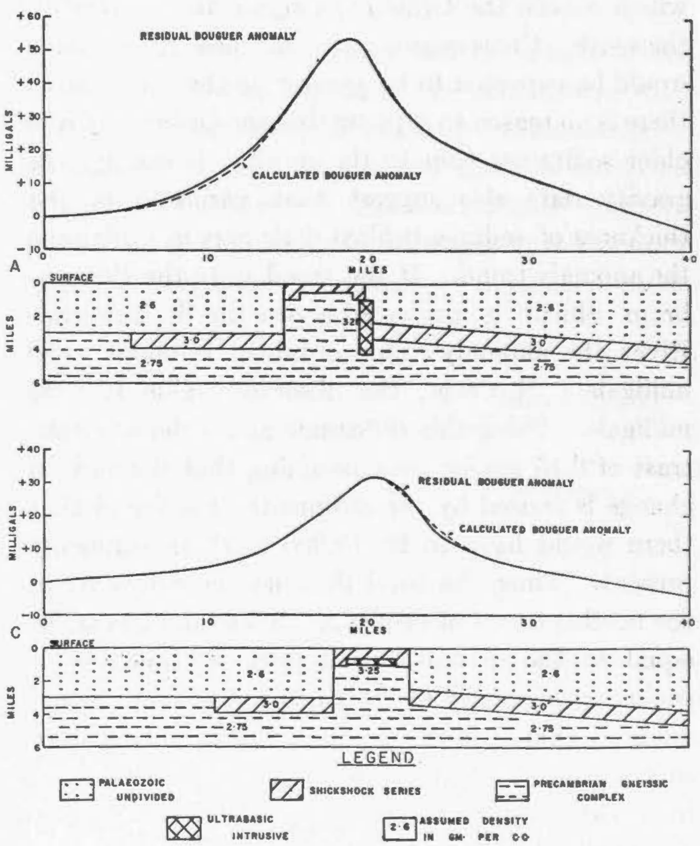

Figure 12. Hypothetical mass distributions which satisfy the residual anomalies of profiles A—B and C—D.

From Figure 12 it is seen that, with one modification, the same mass distribution can explain the observed anomalies. It was necessary to alter the location and altitude of the ultrabasic intrusive in order to explain the position of the peak of the gravity maximum. The position of the ultrabasic body in profile C—D is in accordance with the nearby exposure of the Mount Albert ultrabasic intrusion. The faults are based on suggestions by McGerrigle (1954) and Alcock (1926).

The uncertainty in the present interpretation is the extent and thickness of the Shickshock series, which has been assumed to pinch out to the north and extend to an unknown distance to the south. The thickness of the sediments to the north has been adopted as being 15,000 feet. There could, of course, be other assumptions concerning thicknesses and extent, but since there is no way of deciding which is correct it is of no value to pursue the interpretation further.

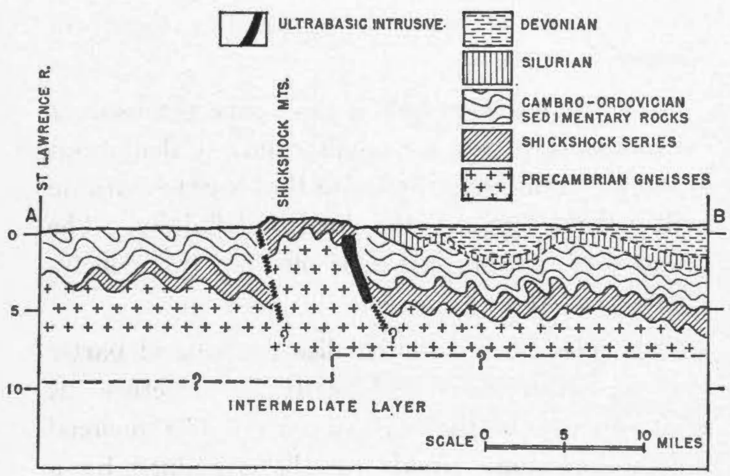

Figure 13. **Diagrammatic geological sketch along profile A—B based on the mass distribution given in Figure 12.**

Figure 13 provides a geological sketch based on the above interpretation and the known surface. It is suggested that the main structural feature of the Shickshock Mountains may be a horst.*

Eastward from profile C—D it is not known what happens to the suggested horst structure. Possibly it continues and is covered by younger sediments. The only high-density rocks, similar to those of the Shickshock series, exposed in eastern Gaspé outcrop along the Dartmouth River, 10 miles northwest of the town of Gaspé. Here there is a very small outcrop of serpentinized peridotite and dense volcanics known as the Lady Step Volcanics (McGerrigle, 1950). Three samples of these volcanics, provided by C. H. Smith of the Geological Survey of Canada, gave a mean density of 2.95 gm/cc. It is not known if these lavas are in any way related to the lavas of the Shickshock series.

The foregoing has assumed that the Shickshock series is pre-Ordovician. While it is not proposed to make a complete interpretation based on a Middle Ordovician age, a few remarks may be made. The residual gravity anomaly profiles suggest a mass distribution similar to that of Figure 13 or one that extends to great depth such as is shown in Figure 14. The latter is similar to an interpretation made by Thompson and Garland (1957). However, in order to explain the position of the peaks it is necessary that there be a change of dip as shown in the diagram. Alternatively, it would be possible to assign a vertical dip to the dyke-like body and employ the presence of ultrabasic bodies to explain the shift in position of the gravity maximum with respect to the limits of outcrop of the Shickshock. Unless it be assumed that the ultrabasic bodies were older than

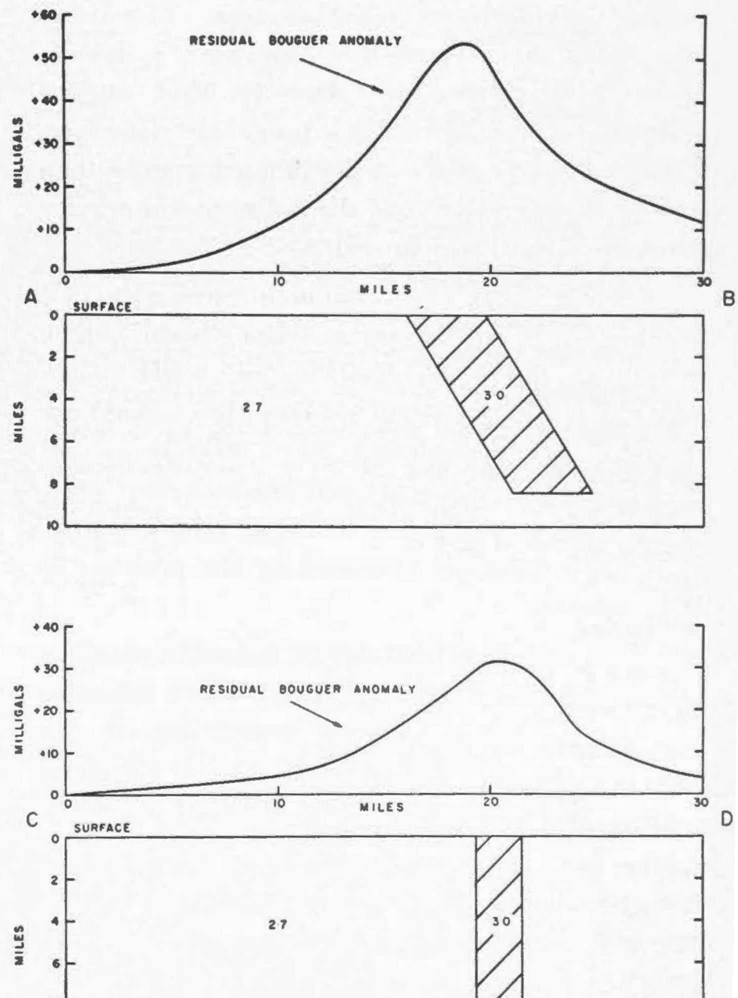

Figure 14. **Hypothetical mass distribution given as a possible alternative to that of Figure 12.**

*May refer to a true horst or an upthrust block.

the dyke, this would be difficult to visualize. In any event a dyke-like body extending to considerable depth would be required.

Local Bouguer Anomalies

There are several features of the Bouguer anomaly map which are worthwhile noting, but because of insufficient data, computations cannot be made. Perhaps the most interesting feature is the apparent small influence which the granitic bodies of the Tabletop Mountains area exert on the gravity anomalies. In the Maritime Provinces, Garland (1953) found that relatively large gravity minima were usually associated with the known granitic intrusives and that the granite bodies required to explain these minima were rather large. It could be that the granite bodies in Gaspé have a density (ρ = 2.60 gm/cc.) so close to that of the sediments that little contrast is provided. However, f the bodies extended to a depth much greater than 3 miles (the lower limit of the sediments) a gravity ninimum would be produced.

There is a gravity minimum over what is requently termed the central Gaspé "basin" which oincides with the synclinal axis of the Devonian andstone sequence. The Middle Devonian York River formation (sandstone) has a mean density of 2.45 gm/cc., which is somewhat less than the formaions above and below. It is likely, therefore, that nost of the anomaly is caused by the presence of his formation.

In the vicinity of Chandler on the south coastline f Gaspé there is a gravity "high" which coincides enerally with the outcrop boundaries of the Maquereau group (ρ = 2.71 gm/cc.). In addition, ltrabasic rocks intrude the Maquereau group Alcock, 1935). It appears reasonable to ascribe he gravity "high" to the combined effects of the ocks of the relatively dense Maquereau group and he dense ultrabasic rocks.

In the eastern end of Gaspé near the town of St. eorges there is a tongue-like gravity minimum hich almost reaches the coast. This is most likely aused by a synclinal structure in the sedimentary ocks.

CONCLUSIONS

The work in the Gaspé peninsula has produced some rather startling gravity anomalies. These and their structural interpretations may be summarized as follows:

(i) The gravity anomalies show a pronounced east-west trend with marked variations both across and along the strike of main structural pattern.

(ii) The gravity positive over the Shickshock Mountains is very unusual and suggests that they have no roots as required by the Airy theory of isostasy.

(iii) The northern half of the Gaspé peninsula is not in a state of isostatic equilibrium. Calculations of the stress difference indicate that a crust with no faults could support the load indefinitely. The presence of faulting in Gaspé modifies this conclusion somewhat.

(iv) The Bouguer anomalies are caused partly by near-surface rocks and partly by structures at greater depth in the earth's crust. The regional Bouguer anomaly trends can be explained by a rotational fault zone which has disturbed the hypothetical "intermediate layer". The gravity positive over the Shickshock Mountains can be explained by the presence of high-density lavas and by ultrabasic rocks. It is also suggested that the main structure associated with the Shickshock Mountains could be a horst.

(v) In general, local gravity anomalies correlate with surface geology; no quantitative studies have been made. Because the granitic bodies are not associated with gravity minima of any consequence it is possible that they are quite small.

At present, no measurements have been made over Logan's Line and with the advent of gravimeters capable of measuring gravity at sea (Gilbert, 1949), studies over the St. Lawrence River and the Gulf of St. Lawrence remain a fruitful problem for the future. Such an investigation might well solve the problem of the apparent structural discontinuity between the Gaspé peninsula and Newfoundland, as well as adding other useful information to our present knowledge.

ACKNOWLEDGEMENTS

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APPENDIX I

Principal Facts for Gravity Stations

Principal Facts for Gravity Stations

First-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
1	Mont Joli	68° 11′.3	48° 35′.4	261(A)	980.8901	−0.0379	−0.0468
2	Baie-des-Sables	67 52.9	48 43.6	14(A)	.9124	−0.0511	−0.0521
3	Matane	67 31.9	48 50.9	35(A)	.9213	−0.0511	−0.0523
4	Ste. Félicité	67 20.3	48 54.1	51(B)	.9250	−0.0507	−0.0524
5	Les Mechins	66 58.8	49 00.1	77(A)	.9374	−0.0449	−0.0475
28	Cap Chat	66 36.5	49 06.7	17(A)	.9599	−0.0378	−0.0384
40	Ste. Anne-des-Monts	66 29.1	49 07.8	18(A)	.9671	−0.0321	−0.0327
40A	Ste. Anne-des-Monts	66 29.1	49 07.8	23(A)	.9665	−0.0322	−0.0330
41	Ste. Marthe	66 10.5	49 12.3	96(A)	.9944	−0.0042	−0.0074
42	Mont Louis	65 43.8	49 13.8	14(A)	981.0117	0.0031	0.0026
64	Cap-de-la-Madeleine	65 19.5	49 15.1	88(A)	.0209	0.0173	0.0143
68	Grande-Vallée	65 07.5	49 13.6	69(A)	.0264	0.0233	0.0209
69	Cloridorme	64 50.2	49 10.8	54(A)	.0302	0.0299	0.0280
70	Rivière-du-Renard	64 22.9	48 59.6	14(A)	.0125	0.0251	0.0246
71	Cap-des-Rosiers	64 12.2	48 51.4	48(B)	980.9917	0.0197	0.0181
72	Gaspé	64 23.6	48 49.6	39(A)	.9923	0.0222	0.0208
230	St. Georges	64 14.3	48 39.5	172(A)	.9621	0.0195	0.0136
217	Percé	64 13.0	48 31.5	77(A)	.9552	0.0156	0.0130
209	Grande-Rivière	64 29.4	48 24.1	56(A)	.9335	0.0030	0.0011
198	Chandler	64 40.5	48 20.8	3(A)	.9340	0.0034	0.0033
197	Port Daniel	64 58.3	48 10.8	10(A)	.9065	−0.0086	−0.0089
196	Paspebiac	65 15.4	48 01.8	189(A)	.8781	−0.0066	−0.0111
195	Caplan	65 40.8	48 06.3	88(A)	.8958	−0.0051	−0.0081
194	Cascapedia	65 53.7	48 15.1	38(A)	.9053	−0.0135	−0.0148
193	Carleton	66 08.1	48 06.9	54(A)	.8982	−0.0068	−0.0087
181	Escuminac	66 28.8	48 07.3	19(A)	.8823	−0.0266	−0.0273
180	Broadlands	66 45.2	48 00.8	33(A)	.8662	−0.0317	−0.0328
172	Matapedia	66 56.2	47 58.5	54(A)	.8652	−0.0272	−0.0291
171	Routhierville	67 09.2	48 11.0	279(A)	.8667	−0.0234	−0.0329
170	Causapscal	67 13.4	48 21.3	482(A)	.8785	−0.0078	−0.0242
169	Amqui	67 25.6	48 28.1	546(A)	.8936	0.0032	−0.0154
168	Sayabec	67 41.0	48 33.9	554(A)	.8993	0.0010	−0.0179
173	Tidehead	66 45.8	47 58.8	33(A)	.8630		
174	Dalhousie	66 22.5	48 03.8	55(A)	.8830		
179	Nash Creek	66 04.6	47 55.4	23(A)	.8768		
178	Bathurst	65 39.5	47 37.2	20(A)	.8387		
177	Big Eskadellic	65 24.4	47 17.3	231(A)	.8218		
176	Newcastle	65 32.8	47 00.1	45(A)	.8125		
175	Chatham A.F.B.	65 26.4	47 00.8		.8189		

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
323A	S.M. No. 238	66 10.0	48 35.6	443(A)	980.9024	−0.0088	−0.0239
324	B.M. No. M-20	66 07.1	48 47.5	1760(A)	.8577	0.0525	−0.0074
6		67° 19′.1	48° 53′.3	252(A)	.9120	−0.0436	−0.0522
7		67 18.1	48 53.0	325(C)	.9078	−0.0405	−0.0516
8		67 17.5	48 52.1	875(C)	.8765	−0.0187	−0.0485
9		67 17.1	48 51.2	886(C)	.8758	−0.0171	−0.0475
10		67 18.0	48 50.4	879(C)	.8754	−0.0169	−0.0469
11	St. Adelme	67 19.1	48 49.4	958(C)	.8706	−0.0128	−0.0454
12		67 18.1	48 48.9	1048(C)	.8662	−0.0080	−0.0437

Principal Facts for Gravity Stations

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
13	Grosses Roches	67 10.4	48 56.4	94(B)	980.9284	−0.0467	−0.0499
14		67 10.0	48 53.9	541(B)	.9009	−0.0284	−0.0468
16		67 07.2	48 52.3	1197(B)	.8626	−0.0026	−0.0434
17	St. Jean-de-Cherbourg	67 06.7	48 51.5	1040(A)	.8722	−0.0067	−0.0421
18		67 07.5	48 49.5	901(A)	.8819	−0.0071	−0.0377
19		66 57.2	49 00.3	181(C)	.9318	−0.0410	−0.0471
20		66 55.6	48 59.6	508(C)	.9120	−0.0289	−0.0462
21		66 55.5	48 58.6	873(C)	.8926	−0.0125	−0.0422
22		66 54.3	48 57.7	1207(C)	.8730	0.0006	−0.0405
24		66 53.4	48 56.2	1205(C)	.8733	0.0030	−0.0380
25		66 53.4	48 55.3	1316(C)	.8666	0.0081	−0.0367
26		66 52.5	48 54.0	1120(C)	.8789	0.0038	−0.0343
27		66 51.3	48 52.6	1456(C)	.8622	0.0209	−0.0287
29		66 37.1	49 06.2	88(C)	.9546	−0.0356	−0.0386
30		66 37.7	49 05.7	167(C)	.9487	−0.0334	−0.0391
31		66 36.8	49 04.6	789(C)	.9111	−0.0109	−0.0378
32		66 36.5	49 03.6	1155(C)	.8889	0.0027	−0.0366
33		66 35.4	49 03.0	1046(C)	.8970	0.0016	−0.0340
34		66 34.4	49 02.4	1218(C)	.8869	0.0086	−0.0335
35		66 34.2	49 01.6	1166(C)	.8896	0.0076	−0.0321
36		66 33.4	49 00.7	904(C)	.9045	−0.0080	−0.0316
37		66 33.5	48 59.9	1242(C)	.8840	0.0116	−0.0307
38		66 33.1	48 58.9	1224(C)	.8864	0.0138	−0.0279
39		66 32.9	58 58.1	1362(C)	.8785	0.0201	−0.0263
43		66 10.2	49 11.7	41(C)	.9956	−0.0072	−0.0086
44		66 12.2	49 10.6	328(C)	.9723	−0.0019	−0.0131
45		66 03.3	49 11.0	213(C)	.9860	0.0003	−0.0075
46		66 03.2	49 09.0	490(C)	.9599	0.0033	−0.0134
47		66 03.4	49 07.3	1296(C)	.9077	0.0294	−0.0147
48		66 01.9	49 05.0	1916(C)	.8750	0.0584	−0.0068
49		66 01.4	49 04.5	1945(C)	.8731	0.0600	−0.0062
50		66 00.9	49 03.6	1976(C)	.8706	0.0618	−0.0055
51		66 01.0	49 01.7	1975(C)	.8694	0.0634	−0.0039
52		66 02.2	49 05.8	1902(C)	.8760	0.0569	−0.0078
53		66 04.2	49 11.6	75(C)	.9962	−0.0033	−0.0059
54	Mon. No. 250	65 48.9	49 13.4	21(A)	981.0038	−0.0035	−0.0042
55		65 49.1	49 11.9	60(B)	980.9957	−0.0067	−0.0077
56		65 50.1	49 08.9	346(B)	.9708	0.0007	−0.0110
57	Mon. No. 262	65 48.8	49 10.0	216(A)	.9843	0.0004	−0.0069
58		65 43.7	49 12.1	33(C)	981.0046	0.0004	−0.0007
59		65 42.4	49 10.4	67(C)	.0005	0.0010	−0.0004
60		65 42.7	49 09.1	191(C)	980.9931	0.0082	0.0017
61		65 43.7	49 07.6	1077(C)	.9410	0.0417	0.0050
62		65° 46′.4	49° 08′.1	1515(C)	.9130	0.0541	0.0025
63	Mon. No. 260	65 48.8	49 04.2	1856(A)	.8834	0.0624	−0.0012
65		65 23.6	49 14.8	294(B)	981.0070	0.0233	0.0132
66		65 24.3	49 13.4	894(B)	980.9717	0.0465	0.0160
67		65 24.4	49 04.5	559(B)	.9916	0.0333	0.0192
73		64 14.4	48 50.4	90(B)	.9885	0.0220	0.0189
74		64 17.5	48 49.4	148(B)	.9881	0.0285	0.0234
75		64 20.6	49 50.4	62(B)	.9975	0.0283	0.0262
76		64 24.6	48 51.4	57(B)	.9966	0.0255	0.0235

Principal Facts for Gravity Stations

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
77	....	64 29.5	48 52.2	79(B)	980.9969	0.0265	0.0238
78	B.M. MDCCXLVI........................	64 33.2	48 53.3	141(A)	981.0010	0.0350	0.0302
79	....	64 17.3	48 49.8	268(B)	980.9801	0.0312	0.0221
80	....	64 16.6	48 50.0	585(B)	.9594	0.0400	0.0201
81	....	64 16.1	48 50.6	236(B)	.9794	0.0263	0.0183
82	....	64 15.7	48 50.6	188(B)	.9819	0.0243	0.0179
83	....	64 21.5	48 58.4	106(B)	981.0040	0.0271	0.0235
84	....	64 19.2	48 57.3	132(B)	980.9991	0.0261	0.0216
85	....	64 18.5	48 56.2	31(B)	981.0045	0.0238	0.0228
86	....	64 16.1	48 54.8	154(B)	.9933	0.0267	0.0209
87	....	64 14.6	48 53.8	47(B)	.9978	0.0221	0.0205
88	....	64 12.8	48 52.4	58(B)	.9937	0.0212	0.0192
89	....	64 19.2	48 55.8	36(B)	.0028	0.0232	0.0220
90	....	64 19.7	48 55.6	36(B)	.0024	0.0237	0.0225
91	....	64 20.5	48 54.6	64(B)	980.9983	0.0230	0.0208
92	....	64 21.6	48 53.5	226(B)	.9865	0.0282	0.0205
93	....	64 21.8	48 53.3	262(B)	.9844	0.0297	0.0208
94	....	64 21.9	48 53.1	273(B)	.9840	0.0307	0.0214
95	....	64 22.3	48 53.0	382(B)	.9775	0.0345	0.0215
96	....	64 22.7	48 52.9	523(B)	.9691	0.0396	0.0218
97	....	64 22.8	48 52.5	479(B)	.9717	0.0386	0.0222
98	....	64 22.9	48 52.3	512(B)	.9708	0.0421	0.0236
99	....	64 22.9	48 51.7	439(B)	.9752	0.0395	0.0245
100	....	64 22.8	48 51.5	433(B)	.9755	0.0394	0.0247
101	....	64 23.0	48 51.3	254(B)	.9857	0.0331	0.0244
102	B.M. MDCCCXXIII......................	64 28.5	49 03.1	75(A)	981.0159	0.0290	0.0264
103	....	64 33.0	49 04.8	78(B)	.0188	0.0295	0.0269
104	B.M. MDCCCXXII.......................	64 36.1	49 06.4	178(A)	.0145	0.0322	0.0262
105	Mon. No. 277..............................	64 36.7	49 05.5	485(A)	980.9941	0.0421	0.0256
106	Mon. No. 275..............................	64 47.5	49 09.6	61(A)	981.0277	0.0297	0.0277
107	....	64 39.3	49 06.0	546(B)	980.9916	0.0446	0.0260
108	....	64 44.4	49 07.4	41(B)	981.0237	0.0272	0.0258
109	Mon. No. 273..............................	64 51.4	49 11.2	65(A)	.0304	0.0304	0.0282
110	....	64 54.1	49 11.7	267(B)	.0179	0.0362	0.0271
111	Mon. No. 272..............................	64 56.5	49 12.4	75(A)	.0297	0.0276	0.0255
112	....	64 59.5	49 12.7	240(B)	.0186	0.0329	0.0247
113	Mon. No. 271..............................	65 02.6	49 13.3	159(A)	.0222	0.0279	0.0224
114	....	65 04.9	49 13.5	106(B)	.0244	0.0248	0.0212
115	....	65 08.8	49 12.5	16(B)	.0258	0.0192	0.0187
116	....	65 09.2	49 11.4	31(B)	.0221	0.0186	0.0176
117	....	65 10.4	49 10.7	56(B)	.0183	0.0182	0.0163
118	Mon. No. 268..............................	65° 10′.8	49° 10′.9	71(A)	.0178	0.0188	0.0164
119	....	65 11.2	49 09.3	132(B)	.0114	0.0205	0.0160
120	....	65 11.3	49 07.4	196(B)	.0053	0.0232	0.0166
121	....	65 11.3	49 07.0	216(B)	.0040	0.0244	0.0171
122	....	65 02.6	49 13.3	503(B)	980.9985	0.0365	0.0194
123	....	65 12.2	49 13.6	612(B)	.9899	0.0378	0.0169
124	Mon. No. 267..............................	65 14.1	49 13.1	808(A)	.9773	0.0443	0.0168
125	....	65 15.6	49 13.3	792(B)	.9791	0.0443	0.0173
126	Mon. No. 266..............................	65 17.2	49 14.0	35(A)	981.0229	0.0159	0.0147
127	....	65 18.4	49 14.4	23(B)	.0254	0.0167	0.0159
128	....	65 21.5	49 15.1	81(B)	.0209	0.0166	0.0139

PRINCIPAL FACTS FOR GRAVITY STATIONS

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
129	Manche d'Épée	65 25.8	49 15.3	39(B)	981.0216	0.0131	0.0117
130	Mon. No. 259	65 22.0	49 15.0	846(A)	980.9705	0.0383	0.0095
131	Mon. No. 253	65 32.4	49 14.7	73(A)	981.0178	0.0134	0.0109
132		65 32.4	49 14.1	89(B)	.0148	0.0127	0.0087
133	Mon. No. 252	65 38.5	49 14.7	7(B)	.0174	0.0068	0.0065
134		65 35.1	49 15.3	9(B)	.0214	0.0099	0.0097
135		65 41.0	49 14.7	196(B)	.0058	0.0129	0.0063
136		65 45.9	49 14.3	15(B)	.0112	0.0019	0.0014
137	Rivière-à-Claude	65 54.3	49 13.3	63(B)	.0046	0.0012	−0.0009
138	B.M. MDCCCLXVI	66 58.5	49 13.6	14(A)	981.0039	−0.0045	−0.0050
139		66 01.4	49 13.4	18(B)	.0023	−0.0054	−0.0060
140		66 04.1	49 12.9	16(B)	.0024	−0.0048	−0.0053
141		66 07.1	49 12.6	28(B)	.0004	−0.0052	−0.0061
142		66 14.2	49 11.7	176(B)	980.9837	−0.0066	−0.0126
143		66 18.1	49 10.9	24(B)	.9818	−0.0216	−0.0225
144	Tourelle	66 24.7	49 09.6	98(A)	.9689	−0.0256	−0.0289
145		66 26.7	49 08.7	67(B)	.9671	−0.0290	−0.0314
146		66 30.8	49 07.3	24(B)	.9644	−0.0337	−0.0345
147		66 33.4	49 07.6	16(B)	.9632	−0.0361	−0.0366
148	Cap Chat—R.C. Church	66 41.3	49 05.8	89(B)	.9513	−0.0394	−0.0415
149		66 45.1	49 04.7	151(B)	.9430	−0.0392	−0.0443
150		66 48.4	49 03.3	10(B)	.9471	−0.0464	−0.0467
151		66 52.5	49 02.4	271(B)	.9287	−0.0388	−0.0480
152		66 56.3	49 01.1	152(B)	.9337	−0.0430	−0.0482
153		67 02.0	48 59.0	87(B)	.9346	−0.0451	−0.0481
154		67 07.5	48 57.3	94(B)	.9311	−0.0465	−0.0487
155		67 13.9	48 55.4	219(B)	.9182	−0.0437	−0.0539
156		67 17.2	48 54.5	19(B)	.9277	−0.0517	−0.0524
157		67 22.4	48 53.6	54(B)	.9243	−0.0505	−0.0524
158	B.M. MCCCLXXVII	67 26.9	48 52.1	23(A)	.9242	−0.0512	−0.0520
159		67 29.5	48 51.3	70(B)	.9195	−0.0503	−0.0527
160	B.M. MCCCXLIX	67 32.9	48 51.0	37(A)	.9200	−0.0525	−0.0538
160(a)	B.M. MCCCL	67 36.0	48 49.1	14(A)	.9199	−0.0530	−0.0535
161	B.M. MCCCLI	67 37.9	48 48.7	18(A)	.9191	−0.0518	−0.0524
162	B.M. MCCCLII	67 39.3	48 48.2	13(A)	.9187	−0.0519	−0.0523
163	B.M. MCCCLVIII—St. Ulric	67 42.1	48 47.2	17(A)	.9168	−0.0519	−0.0525
164	B.M. MCCCLX	67 44.6	48 46.5	16(A)	.9158	−0.0520	−0.0525
165	B.M. MCCCLXII	67 49.8	48 45.0	16(A)	.9139	−0.0516	−0.0521
166	B.M. MCCCLXVII	67 55.4	48 42.2	134(A)	.9033	−0.0519	−0.0565
167	B.M. MCCCLXXIII—Metis Beach	68° 04′.2	48° 39′.9	15(A)	.9078	−0.0533	−0.0538
182		66 45.9	48 00.5	25(C)	.8667	−0.0314	−0.0323
183		66 48.1	48 02.3	83(C)	.8705	−0.0249	−0.0277
184		66 49.0	48 02.6	606(C)	.8409	−0.0058	−0.0264
185		66 49.1	48 03.7	716(C)	.8373	−0.0007	−0.0250
186		66 49.5	48 04.8	1016(C)	.8217	0.0103	−0.0243
187	St. Fidèle	66 50.6	48 06.2	974(C)	.8217	0.0042	−0.0290
188		66 51.6	48 08.5	1248(C)	.8126	0.0175	−0.0250
189		66 52.3	48 05.8	986(C)	.8242	0.0084	−0.0251
190		66 54.5	48 04.9	962(C)	.8244	0.0076	−0.0250
191		66 59.5	48 03.4	994(C)	.8190	0.0076	−0.0263
192		67 00.9	48 00.7	194(C)	.8596	−0.0230	−0.0296
199		64 41.5	48 21.8	145(B)	.9247	0.0059	0.0010

Principal Facts for Gravity Stations

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
200	....	64 41.3	48 22.5	250(B)	981.9184	0.0085	0.0000
201	Mon. No. 368..........................	64 41.0	48 22.8	318(A)	.9154	0.0144	0.0006
202	....	64 42.1	48 24.1	609(B)	.8975	0.0190	−0.0018
203	....	64 44.6	48 25.8	852(B)	.8820	0.0238	−0.0052
204	....	64 46.3	48 26.3	859(B)	.8809	0.0226	−0.0067
205	....	64 48.3	48 27.5	1206(B)	.8615	0.0340	−0.0070
206	Mon. No. 369..........................	64 49.8	48 29.6	1324(A)	.8567	0.0372	−0.0079
207	....	64 50.9	48 31.0	1334(B)	.8573	0.0367	−0.0088
208	Mon. No. 377..........................	64 54.4	48 31.4	1434(A)	.8494	0.0376	−0.0113
210	....	64 28.9	48 24.9	214(B)	.9255	0.0086	0.0013
211	....	64 28.6	48 26.5	350(B)	.9205	0.0140	0.0021
212	....	64 29.7	48 28.1	207(B)	.9308	0.0085	0.0014
213	....	64 31.1	48 29.8	663(B)	.9058	0.0239	0.0013
214	Mon. No. 380..........................	64 31.9	48 30.8	645(B)	.9080	0.0229	0.0009
215	....	64 33.9	48 33.5	894(B)	.8969	0.0312	0.0007
216	....	64 32.6	48 31.8	338(B)	.9272	0.0117	0.0002
218	....	64 17.5	48 33.9	18(B)	980.9515	0.0028	0.0022
219	....	64 20.8	48 33.6	179(B)	.9399	0.0067	0.0006
220	....	64 21.2	48 33.1	211(B)	.9384	0.0090	0.0019
221	....	64 20.5	48 31.9	278(A)	.9338	0.0125	0.0031
222	....	64 22.9	48 31.2	400(B)	.9254	0.0166	0.0030
223	....	64 22.9	48 29.3	592(B)	.9121	0.0242	0.0040
224	Percé Station..........................	64 19.1	48 28.4	101(A)	.9393	0.0066	0.0032
225	....	64 21.7	48 26.4	224(B)	.9285	0.0102	0.0026
226	....	64 24.6	48 27.8	411(B)	.9199	0.0173	0.0033
227	....	64 26.7	48 27.1	337(B)	.9228	0.0142	0.0027
228	....	64 28.4	48 29.5	608(B)	.9093	0.0226	0.0019
229	....	64 16.6	48 30.3	584(B)	.9174	0.0272	0.0073
231	....	64 15.9	48 39.5	341(B)	.9466	0.0199	0.0086
232	....	64 14.0	48 37.7	113(A)	.9601	0.0146	0.0108
233	Barachois Station.....................	64 15.8	48 37.3	62(A)	.9569	0.0072	0.0051
234	....	64 19.5	48 36.9	3(B)	.9522	−0.0024	−0.0025
235	Mon. No. 325..........................	64 21.5	48 37.9	103(A)	.9463	−0.0004	−0.0039
236	....	64 23.2	48 38.6	141(B)	.9447	0.0006	−0.0042
237	Mon. No. 326..........................	64 25.6	48 39.0	207(A)	.9415	0.0030	−0.0041
238	....	64 31.3	48 53.5	267(B)	.9917	0.0372	0.0281
239	....	64 30.6	48 54.6	462(B)	.9847	0.0469	0.0311
240	....	64° 30′.2	48° 56′.2	579(B)	.9822	0.0531	0.0334
241	....	64 29.6	48 57.3	287(B)	.9970	0.0387	0.0289
242	....	64 25.2	48 59.3	21(B)	981.0095	0.0232	0.0225
243	....	64 27.1	48 58.4	68(B)	.0047	0.0242	0.0219
244	....	64 31.6	48 51.8	59(B)	980.9976	0.0260	0.0240
245	....	64 36.0	48 54.4	13(B)	981.0140	0.0342	0.0338
246	....	64 37.7	48 55.8	66(B)	.0149	0.0381	0.0359
247	....	64 39.4	48 56.5	130(B)	.0105	0.0386	0.0342
248	....	64 32.8	48 49.5	45(B)	980.9886	0.0190	0.0175
249	....	64 37.4	48 50.7	48(B)	.9903	0.0193	0.0177
250	....	64 40.1	48 50.1	87(B)	.9800	0.0136	0.0106
251	Mon. No. 301..........................	64 44.5	48 49.5	126(A)	.9712	0.0093	0.0050
252	Mon. No. 302..........................	64 48.7	48 49.3	223(A)	.9627	0.0102	0.0026
253	....	64 53.8	48 49.6	353(B)	.9540	0.0133	0.0013
254	Hydro B.M. No. 57.....................	64 56.7	48 48.2	491(A)	.9406	0.0150	−0.0017

Principal Facts for Gravity Stations

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
255	....	64 13.6	48 47.5	76(B)	980.9841	0.0204	0.0179
256	....	64 09.8	48 45.1	302(B)	.9610	0.0222	0.0119
257	....	64 28.0	48 47.4	115(B)	.9784	0.0186	0.0147
258	....	64 28.7	48 49.4	63(B)	.9908	0.0231	0.0210
259	....	64 23.0	48 47.6	44(B)	.9912	0.0244	0.0229
260	....	64 28.6	48 46.1	33(B)	.9764	0.0108	0.0097
261	Douglastown........	64 22.6	48 46.0	14(A)	.9857	0.0185	0.0180
262	Mon. No. 320........	64 19.6	48 44.6	25(A)	.9855	0.0215	0.0206
263	....	64 17.5	48 43.1	155(B)	.9759	0.0263	0.0210
264	Mon. No. 321........	64 15.5	48 41.2	102(A)	.9710	0.0192	0.0157
265	....	64 10.7	48 37.7	83(B)	.9716	0.0232	0.0204
266	....	64 18.8	48 35.8	46(B)	.9496	0.0006	−0.0009
267	....	64 15.2	48 32.4	311(B)	.9359	0.0170	0.0064
268	....	64 15.6	48 29.6	140(B)	.9417	0.0109	0.0061
269	Cape Cove........	64 20.0	48 26.2	60(A)	.9374	0.0041	0.0021
270	....	64 21.8	48 25.1	39(B)	.9348	0.0012	−0.0006
271	....	64 25.3	48 25.9	79(B)	.9343	0.0032	0.0005
272	....	64 32.2	48 23.2	51(B)	.9327	0.0030	0.0013
273	....	64 35.4	48 24.9	436(B)	.9101	0.0141	−0.0007
274	....	64 38.7	48 26.8	683(B)	.8968	0.0212	−0.0020
275	....	64 40.3	48 27.9	742(B)	.8942	0.0225	−0.0028
276	....	64 36.7	48 26.3	657(B)	.8986	0.0213	−0.0011
276(a)	Ste. Adélaide........	64 35.8	48 22.0	29(A)	.9318	0.0018	0.0008
277	....	64 38.9	48 22.6	199(B)	.9221	0.0072	0.0004
278	Mon. No. 363........	64 44.3	48 20.4	13(A)	.9314	0.0023	0.0019
279	....	64 42.5	48 18.4	43(B)	.9301	0.0068	0.0054
280	Newport........	64 44.6	48 16.1	40(A)	.9256	0.0055	0.0041
281	....	64 46.5	48 14.1	149(A)	.9122	0.0043	−0.0008
282	....	64 49.4	48 12.4	294(B)	.8984	0.0078	−0.0023
283	Gasçons........	64 52.0	48 11.9	114(A)	.9058	−0.0015	−0.0050
284	....	64 55.2	48 11.8	240(B)	.8969	0.0021	−0.0061
285	....	64 57.5	48 13.2	57(B)	.9104	−0.0038	−0.0058
286	B.M. MDCCCXIV........	64 59.0	48 09.2	191(A)	.8929	−0.0027	−0.0092
287	....	65 00.7	48 07.2	38(B)	.8976	−0.0094	−0.0109
288	....	65 04.5	48 05.7	52(B)	.8935	−0.0099	−0.0117
289	St. Godfroi........	65° 07'.1	48° 05'.1	80(A)	.8906	−0.0093	−0.0120
290	....	65 08.3	48 06.8	261(B)	.8818	−0.0037	−0.0125
291	....	65 06.6	48 08.3	471(B)	.8716	0.0037	−0.0123
292	....	65 09.5	48 03.1	71(B)	.8880	−0.0097	−0.0121
293	....	65 13.5	48 02.1	125(B)	.8825	−0.0086	−0.0129
294	....	65 14.7	48 03.9	146(C)	.8827	−0.0092	−0.0141
295	....	65 15.0	48 05.6	372(C)	.8728	−0.0004	−0.0131
296	....	65 14.2	48 07.8	836(C)	.8493	0.0164	−0.0120
297	....	65 15.0	48 10.5	901(C)	.8504	0.0196	−0.0108
298	....	65 13.2	48 12.4	1024(C)	.8453	0.0232	−0.0117
299	New Carlisle........	65 19.4	48 00.4	71(A)	.8886	−0.0111	−0.0114
300	....	65 23.7	48 00.2	57(A)	.8848	−0.0099	−0.0119
301	....	65 27.8	48 01.1	35(B)	.8893	−0.0088	−0.0100
302	Bonaventure........	65 28.3	48 02.3	61(A)	.8917	−0.0058	−0.0078
303	....	65 26.9	48 04.7	57(C)	.8941	−0.0073	−0.0093
304	....	65 26.5	48 06.4	114(C)	.8934	−0.0053	−0.0092
305	....	65 23.4	48 08.4	432(C)	.8767	0.0049	−0.0098

Principal Facts for Gravity Stations

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
306	....	65 24.3	48 10.6	713(C)	980.8640	0.0154	−0.0089
307	....	65 26.9	48 10.9	559(C)	.8741	0.0106	−0.0085
308	St. Siméon..........	65 34.1	48 04.5	45(A)	.8949	−0.0074	−0.0089
309	....	65 37.5	48 05.1	130(B)	.8917	−0.0035	−0.0079
310	....	65 39.4	48 08.7	387(B)	.8813	0.0049	−0.0083
311	....	65 38.2	48 10.7	467(B)	.8782	0.0063	−0.0096
312	....	65 42.0	48 11.8	1107(B)	.8407	0.0273	−0.0104
313	....	65 34.2	48 10.4	338(B)	.8868	0.0032	−0.0083
314	....	65 39.2	48 12.9	974(B)	.8498	0.0223	−0.0109
315	....	65 45.4	48 07.0	70(A)	.8962	−0.0075	−0.0099
316	....	65 49.7	48 08.5	196(B)	.8936	−0.0005	−0.0071
317	New Richmond..........	65 50.7	48 10.3	29(A)	.9047	−0.0078	−0.0088
318	....	65 54.0	48 12.7	4(B)	.9026	−0.0158	−0.0160
319	....	65 51.1	48 13.7	233(B)	.8946	−0.0038	−0.0117
320	....	65 50.2	48 11.8	239(B)	.8933	−0.0017	−0.0099
321	Mon. No. 355..........	65 47.7	48 12.1	64(A)	.9051	−0.0068	−0.0090
322	Mon. No. 356..........	65 43.5	48 14.3	89(A)	.9048	−0.0080	−0.0111
323	....	65 39.5	48 16.1	420(B)	.8866	0.0022	−0.0121
325	....	66 18.5	49 06.1	1253(B)	.9065	0.0259	−0.0168
326	....	66 15.6	49 01.8	1031(B)	.9150	0.0199	−0.0152
327	....	66 27.0	49 05.8	240(B)	.9555	−0.0199	−0.0281
328	B.M. No. M-26..........	66 25.2	49 03.5	381(A)	.9445	−0.0143	−0.0272
329	....	66 24.1	49 01.8	615(B)	.9305	−0.0038	−0.0247
330	B.M. No. M-25..........	66 22.9	48 59.7	542(A)	.9352	−0.0028	−0.0213
331	....	66 19.0	48 59.6	367(B)	.9472	−0.0071	−0.0196
332	B.M. No. M-24..........	66 14.9	48 59.3	472(A)	.9482	0.0042	−0.0119
333	....	66 11.8	48 58.6	417(B)	.9496	0.0109	−0.0067
334	B.M. No. M-23..........	66 08.5	48 57.9	703(A)	.9435	0.0233	−0.0006
335	Park Chalet..........	66 07.5	48 56.7	697(B)	.9477	0.0288	0.0050
336	....	66 06.5	48 55.5	903(B)	.9388	0.0410	0.0102
337	B.M. No. M-22..........	66 06.1	48 54.2	903(A)	.9395	0.0436	0.0129
338	....	66 06.9	48 52.8	978(B)	.9302	0.0435	0.0102
339	....	66 05.8	48 51.6	1139(B)	.9053	0.0355	−0.0033
340	....	66° 05'.9	48° 50'.9	1142(B)	.9020	0.0335	−0.0054
341	B.M. No. M-21..........	66 05.8	48 50.5	1179(A)	.9005	0.0361	−0.0041
342	....	66 06.6	48 48.9	1433(B)	.8833	0.0452	−0.0036
343	....	66 07.2	48 47.8	1871(B)	.8520	0.0569	−0.0068
344	....	66 08.4	48 46.1	1321(B)	.8788	0.0345	−0.0105
345	Mon. No. 232..........	66 09.5	48 39.5	491(A)	.9104	−0.0022	−0.0189
346	....	66 09.3	48 42.7	886(A)	.8985	0.0183	−0.0118
347	....	66 10.0	48 37.7	482(A)	.9036	−0.0076	−0.0236
348	....	66 08.8	48 33.9	396(B)	.9026	−0.0106	−0.0240
349	....	66 07.5	48 31.6	321(B)	.9066	−0.0102	−0.0211
350	....	66 04.4	48 30.7	261(B)	.9124	−0.0087	−0.0175
351	....	66 02.6	48 28.4	230(B)	.9110	−0.0096	−0.0174
352	....	66 00.5	48 26.1	158(B)	.9123	−0.0116	−0.0170
353	....	66 00.2	48 23.7	114(B)	.9119	−0.0126	−0.0165
354	Mon. No. 240..........	65 58.9	48 20.1	146(A)	.9078	−0.0084	−0.0133
355	....	65 55.8	48 17.9	40(B)	.9124	−0.0104	−0.0118
356	....	65 56.5	48 15.4	157(B)	.8973	−0.0108	−0.0162
357	....	65 57.3	48 13.9	114(B)	.8949	−0.0150	−0.0189
358	Maria..........	65 59.7	48 10.3	32(A)	.8956	−0.0166	−0.0177

Principal Facts for Gravity Stations

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
359	....	66 02.5	48 07.7	88(B)	980.8877	−0.0153	−0.0183
360	B.M. No. MCCCCI—St. Omer............	66 13.2	48 06.6	32(A)	.9004	0.0027	0.0016
361	....	66 15.4	48 09.7	1020(B)	.8492	0.0308	−0.0039
362	....	66 18.2	48 12.4	1159(B)	.8422	0.0397	−0.0066
363	....	66 17.2	48 07.3	12(B)	.8958	−0.0130	−0.0134
364	....	66 19.1	48 08.8	107(B)	.8888	−0.0133	−0.0170
365	Nouvelle West...........................	66 21.9	48 09.1	71(A)	.8882	−0.0176	−0.0201
366	....	66 22.8	48 09.8	85(B)	.8910	−0.0146	−0.0175
367	....	66 26.0	48 11.3	148(B)	.8890	−0.0137	−0.0187
368	....	66 24.2	48 13.5	958(B)	.8490	0.0192	−0.0134
369	....	66 25.3	48 08.5	199(B)	.8752	−0.0179	−0.0247
370	....	66 26.9	48 07.2	11(B)	.8836	−0.0254	−0.0257
371	....	66 21.8	48 06.7	187(B)	.8744	−0.0172	−0.0236
372	....	66 16.5	48 05.2	25(B)	.8951	−0.0096	−0.0105
373	Pointe-à-la-Garde.........................	66 32.3	48 04.9	40(A)	.8739	−0.0290	−0.0302
374	....	66 34.4	48 03.4	32(B)	.8732	−0.0284	−0.0295
375	....	66 38.4	48 03.4	41(B)	.8709	−0.0298	−0.0312
376	Cross Point...............................	66 42.0	48 02.3	28(A)	.8705	−0.0299	−0.0308
377	....	66 43.1	48 04.1	179(C)	.8682	−0.0206	−0.0267
378	....	66 41.9	48 09.1	1006(C)	.8314	−0.0130	−0.0208
379	....	66 44.4	48 10.2	1043(C)	.8290	−0.0117	−0.0234
380	....	66 46.7	48 11.9	1400(C)	.8115	−0.0253	−0.0220
381	....	66 44.4	48 13.6	1023(C)	.8363	0.0123	−0.0225
382	....	66 41.4	48 06.4	929(C)	.8307	0.0087	−0.0230
383	....	66 49.9	48 00.1	53(B)	.8680	−0.0269	−0.0287
384	B.M. No. 1182-G.........................	67 01.7	48 01.1	96(A)	.8644	−0.0280	−0.0312
385	B.M. No. 1183-G.........................	67 02.7	48 02.1	110(A)	.8647	−0.0279	−0.0316
386	....	67 04.8	48 02.3	217(B)	.8582	−0.0246	−0.0320
387	B.M. No. 1185-G.........................	67 05.8	48 04.8	166(A)	.8634	−0.0280	−0.0336
388	B.M. No. 1187-G.........................	67 08.0	48 06.9	210(A)	.8630	−0.0273	−0.0345
389	Milnikek Station..........................	67 09.0	48 08.3	232(A)	.8647	−0.0255	−0.0336
390	B.M. 1189-G..............................	67° 08′.2	48° 09′.4	233(A)	.8648	−0.0272	−0.0351
391	B.M. 1192-G..............................	67 11.3	48 13.2	300(A)	.8706	−0.0206	−0.0310
392	B.M. 1193-G..............................	67 12.9	48 14.5	329(A)	.8707	−0.0199	−0.0311
393	Ste. Florence Station......................	67 14.4	48 15.7	349(A)	.8704	−0.0201	−0.0320
394	B.M. 1195-G..............................	67 14.6	48 17.8	427(A)	.8705	−0.0158	−0.0304
395	B.M. 1196-G..............................	67 14.4	48 19.2	429(A)	.8752	−0.0132	−0.0279
396	....	67 10.3	48 21.4	1003(B)	.8481	0.0106	−0.0235
397	B.M. No. M-2............................	67 03.2	48 20.7	1076(A)	.8426	0.0131	−0.0235
398	....	67 01.0	48 22.1	1505(B)	.8217	0.0305	−0.0208
399	B.M. No. M-3............................	66 58.0	48 23.4	1701(A)	.8141	0.0393	−0.0186
400	....	66 56.3	48 24.8	1502(B)	.8306	0.0350	−0.0162
401	B.M. No. M-4............................	66 53.0	48 26.2	1357(A)	.8420	0.0307	−0.0155
402	....	66 51.5	48 27.5	1293(B)	.8491	0.0298	−0.0142
403	B.M. No. M-5............................	66 50.5	48 29.1	1396(A)	.8460	0.0340	−0.0135
404	....	66 48.2	48 30.7	1669(B)	.8320	0.0434	−0.0135
405	B.M. No. M-6............................	66 47.1	48 31.9	1755(A)	.8292	0.0469	−0.0129
406	....	67 05.0	48 19.1	1454(B)	.8174	0.0258	−0.0238
407	....	67 07.5	48 19.5	1080(B)	.8383	0.0109	−0.0259
408	B.M. 1201-G..............................	67 15.0	48 22.8	446(A)	.8788	−0.0131	−0.0283
409	B.M. 1202-G..............................	67 15.8	48 23.5	493(A)	.8833	−0.0052	−0.0220
410	B.M. 1203-G..............................	67 17.8	48 24.8	494(A)	.8853	−0.0051	−0.0220

Principal Facts for Gravity Stations

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
411	B.M. 1204-G	67 19.8	48 25.6	507(A)	980.8871	−0.0032	−0.0205
412	B.M. 1205-G	67 21.5	48 26.7	522(A)	.8890	−0.0016	−0.0194
413		67 22.1	48 33.6	1073(B)	.8889	0.0398	0.0033
414		67 24.7	48 37.0	858(B)	.8972	0.0229	−0.0063
415		67 20.0	48 39.4	23(B)	.9356	−0.0013	−0.0091
416		67 23.3	48 42.4	178(B)	.9234	−0.0230	−0.0290
417		67 29.3	48 44.0	122(B)	.9167	−0.0373	−0.0415
418		67 32.3	48 47.7	61(B)	.9167	−0.0486	−0.0506
420		67 28.3	48 47.8	650(B)	.8841	−0.0259	−0.0480
421		67 24.1	48 49.2	824(B)	.8750	−0.0207	−0.0488
422		67 16.5	48 42.2	927(B)	.8938	0.0182	−0.0134
423		67 11.5	48 46.1	1137(B)	.8746	0.0129	−0.0258
424	B.M. 1211-G	67 28.3	48 29.8	533(A)	.9005	0.0063	−0.0118
425	B.M. 1215-G	67 32.8	48 32.0	538(A)	.9163	0.0193	0.0006
426	B.M. 1217-G	67 35.2	48 32.7	542(A)	.9106	0.0130	−0.0055
427	B.M. 1218-G	67 37.5	48 33.7	532(A)	.9063	0.0062	−0.0119
428	B.M. 1223-G	67 45.1	48 33.8	753(A)	.8817	0.0022	−0.0234
429		67 46.4	48 36.0	656(B)	.8803	−0.0115	−0.0338
430		67 48.7	48 38.6	612(B)	.8798	−0.0199	−0.0409
431		67 49.1	48 41.9	289(B)	.8967	−0.0384	−0.0483
432	B.M. 1225-G	67 49.7	48 33.1	889(A)	.8653	−0.0002	−0.0305
433	B.M. 1228-G	67 54.9	48 31.5	958(A)	.8555	−0.0012	−0.0338
433-A	B.M. 1230-G	67 59.8	48 31.5	740(A)	.8651	−0.0121	−0.0373
434	B.M. 1232-G	68 04.4	48 31.6	280(A)	.8902	−0.0305	−0.0410
435	B.M. 1234-G	68 07.9	48 32.8	250(A)	.8894	−0.0359	−0.0444
436	Hammermill Barrier	67 03.3	48 47.9	835(A)	.8949	0.0020	−0.0264
437	Lac Matane	66 58.3	48 41.4	750(A)	.9362	0.0450	0.0195
438		66 55.3	48 42.0	873(B)	.9230	0.0425	0.0128
439	Bonjour Fork	66 53.1	48 42.7	1026(A)	.9135	0.0464	0.0115
440		66° 50′.9	48° 42′.1	1421(B)	.8801	0.0511	0.0027
441	Trout Depot	66 47.3	48 39.9	1095(A)	.8915	0.0351	−0.0042
442		66 44.9	48 42.2	1121(B)	.8934	0.0359	−0.0022
443		66 42.0	48 43.7	1058(B)	.9002	0.0346	−0.0014
444	Simoneau—Cap Chat Fork	66 39.4	48 44.8	918(A)	.9100	0.0295	−0.0017
445	Lake	66 38.8	48 43.5	1205(B)	.8846	0.0331	−0.0079
446		66 36.6	48 46.0	1132(B)	.8978	0.0358	−0.0028
447		66 34.4	48 46.9	1296(B)	.8916	0.0436	−0.0005
448		66 50.3	48 43.6	1428(B)	.8945	0.0638	0.0152
449	Lake	66 48.1	48 44.5	1525(A)	.8907	0.0678	0.0159
450		66 48.9	48 41.5	1254(A)	.8856	0.0418	−0.0010
451		66 59.4	48 42.5	751(B)	.9307	0.0380	0.0125
452	Lac Matane	66 59.6	48 43.5	737(A)	.9274	0.0319	0.0068
453		67 00.9	48 44.6	781(B)	.9157	0.0227	−0.0039
454		67 01.8	48 45.4	840(B)	.9036	0.0150	−0.0136
455	Observatory B.M.-2	67 04.2	48 49.6	809(A)	.8911	−0.0067	−0.0343
456	Observatory B.M.-3	67 10.7	48 50.3	1157(A)	.8629	−0.0033	−0.0427
457	Observatory B.M.-4	67 13.5	48 52.2	899(A)	.8754	−0.0178	−0.0485
458	Observatory B.M.-5	67 15.9	48 51.9	427(A)	.9016	−0.0355	−0.0501
459	Mon. No. 264	65 52.9	49 01.5	1815(A)	.8787	0.0726	0.0108
460	Mon. No. 263	65 50.8	49 03.1	2398(A)	.8485	0.0950	0.0133
461		65 56.4	49 00.3	3188(C)	.7926	0.1026	−0.0060
462	Mt. Jacques Cartier	65 56.4	48 59.3	4169(A)	.7284	0.1321	−0.0099

Principal Facts for Gravity Stations

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
463		65 32.5	49 03.7	777(B)	980.9681	0.0463	0.0198
464	Quebec Hy. B.M. P-223	65 36.0	48 58.3	1662(A)	.9030	0.0724	0.0158
465	Mon. No. 313	65 37.7	48 56.0	1477(A)	.9112	0.0666	0.0163
466		65 40.6	48 54.2	1852(A)	.8852	0.0784	0.0155
467		65 46.8	48 53.1	1964(B)	.8741	0.0797	0.0128
468	Mon. No. 314	65 45.2	48 51.5	1751(A)	.8801	0.0680	0.0084
469		65 47.7	48 49.3	1684(B)	.8740	0.0589	0.0015
470	Mon. No. 315	65 47.7	48 51.3	2072(A)	.8585	0.0769	0.0063
471		64 34.2	48 45.5	416(C)	.9470	0.0183	0.0042
472		64 37.4	48 45.3	322(C)	.9485	0.0113	0.0003
473		64 39.3	48 44.5	524(C)	.9366	0.0196	0.0017
474		64 41.0	48 43.5	587(C)	.9291	0.0195	−0.0005
475		64 42.2	48 42.1	789(C)	.9123	0.0238	−0.0031
476		64 42.0	48 47.9	760(B)	.9294	0.0295	0.0036
477		64 44.5	48 46.7	771(B)	.9238	0.0267	0.0005
478		64 46.8	48 44.6	312(B)	.9456	0.0084	−0.0022
479		64 51.2	48 44.7	453(B)	.9361	0.0121	−0.0034
480		64 54.6	48 44.6	417(B)	.9366	0.0093	−0.0049
481		64 58.4	48 44.3	551(B)	.9284	0.0142	−0.0045
482		65 02.1	48 43.6	573(B)	.9237	0.0126	−0.0069
483		65 06.2	48 43.0	610(B)	.9150	0.0083	−0.0125
484		65 10.0	48 42.6	759(B)	.9018	0.0097	−0.0162
485	Mon. No. 327	65 11.8	48 42.6	781(A)	.9032	0.0132	−0.0134
486		64 47.7	48 19.7	41(B)	.9273	0.0019	0.0005
487	Mon. No. 376	64 50.4	48 19.3	113(A)	.9229	0.0048	0.0010
488	Mon. No. 375	64 54.8	48 18.8	317(A)	.9103	0.0122	0.0014
489		64 56.8	48 19.3	571(B)	.8948	0.0198	0.0004
490		64° 58′.3	48° 20′.5	458(B)	.8979	0.0006	−0.0050
491		64 52.3	48 19.4	433(B)	.9044	0.0163	0.0016
492		64 57.2	48 32.0	1357(B)	.8519	0.0319	−0.0143
493	Mon. No. 378	65 00.1	48 32.7	1357(A)	.8516	0.0305	−0.0157
494		65 02.0	48 33.9	1570(B)	.8398	0.0370	−0.0165
495		65 03.9	48 35.4	1478(B)	.8487	0.0350	−0.0153
496		65 42.5	48 15.7	143(B)	.9027	−0.0071	−0.0120
497		65 41.2	48 16.6	275(B)	.8973	−0.0014	−0.0108
498		65 39.9	48 17.7	432(B)	.8879	0.0022	−0.0125
499	Mon. No. 361	65 38.9	48 18.3	603(A)	.8794	0.0089	−0.0116
500		65 39.4	48 19.7	1563(B)	.8249	0.0426	−0.0106
501	Mon. No. 360	65 40.3	48 21.3	918(A)	.8637	0.0184	−0.0128
502		65 41.1	48 22.8	1159(B)	.8521	0.0272	−0.0123
503		65 39.9	48 25.6	450(A)	.8969	0.0011	−0.0142
505		65 39.6	48 23.6	1228(B)	.8481	0.0285	−0.0133
506		66 05.4	48 40.2	718(B)	.9002	0.0078	−0.0166
507	Mon. No. 284	66 01.2	48 40.5	1127(A)	.8777	0.0234	−0.0150
508		66 00.7	48 41.4	1271(B)	.8740	0.0319	−0.0114
509		65 59.3	48 43.1	1058(B)	.8878	0.0231	−0.0129
510	Mon. No. 285	65 57.5	48 42.4	955(A)	.8921	0.0187	−0.0138
511		65 55.7	48 43.3	1408(B)	.8656	0.0335	−0.0144
512		65 52.9	48 43.4	1578(B)	.8601	0.0438	−0.0099
513	Mon. No. 286	65 52.3	48 43.8	1275(A)	.8785	0.0331	−0.0103
514		65 49.0	48 45.5	1356(B)	.8775	0.0372	−0.0089
515	Mon. No. 287	65 48.2	48 44.4	1323(A)	.8803	0.0385	−0.0065

Principal Facts for Gravity Stations

Second-Order Stations

Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
516		65 44.2	48 44.4	1694(B)	980.8587	0.0518	−0.0059
518		66 00.6	48 46.0	1231(B)	.8855	0.0328	−0.0091
519		66 01.7	48 46.9	1333(B)	.8806	0.0361	−0.0093
520	Lac Ste. Anne	66 03.8	48 48.4	1297(A)	.8872	0.0371	−0.0071
521		65 55.8	48 41.0	878(B)	.8930	0.0145	−0.0154
522		65 54.9	48 39.4	827(B)	.8937	0.0128	−0.0154
523		65 55.0	48 37.1	711(B)	.8995	0.0111	−0.0131
524		65 53.9	48 33.5	568(B)	.8998	0.0033	−0.0160
525		65 54.3	48 35.7	625(B)	.9032	0.0036	−0.0177
526		65 59.5	48 44.8	1160(B)	.8855	0.0278	−0.0117
527		66 13.1	48 41.5	511(B)	.9166	0.0029	−0.0145
528		66 24.1	48 15.1	971(C)	.8511	0.0200	−0.0130
529		66 25.1	48 16.3	1322(C)	.8322	0.0323	−0.0127
530		66 25.7	48 17.9	1536(C)	.8212	0.0391	−0.0132
531		66 25.6	48 19.3	1480(C)	.8270	0.0375	−0.0129
532		66 24.4	48 20.7	1727(C)	.8139	0.0455	−0.0133
533		66 23.2	48 21.9	1465(C)	.8311	0.0364	−0.0135
534		66 44.3	48 14.0	642(B)	.8590	−0.0013	−0.0232
535		66 45.9	48 20.9	1617(B)	.8150	0.0360	−0.0191
536		66 45.5	48 15.9	1694(B)	.8025	0.0382	−0.0195
537		66 46.4	48 17.6	1617(B)	.8105	0.0365	−0.0186
538		66 46.0	48 19.5	1633(B)	.8127	0.0373	−0.0183
539		66 48.2	48 21.9	1565(B)	.8204	0.0351	−0.0182
540		66 49.6	48 23.3	1610(B)	.8197	0.0365	−0.0183
541		66 52.6	48 24.0	1546(B)	.8249	0.0346	−0.0180
542		66° 43′.6	48° 21′.2	1463(C)	.8240	0.0301	−0.0197
543		66 41.5	48 22.7	1844(C)	.8037	0.0434	−0.0194
544		66 38.6	48 22.9	1477(C)	.8259	0.0308	−0.0195
545		66 36.1	48 23.1	643(C)	.8731	−0.0007	−0.0226
546		66 34.4	48 24.3	1609(C)	.8202	0.0354	−0.0194
547		66 35.5	48 26.0	1651(C)	.8108	0.0274	−0.0288
548		66 34.6	48 27.9	1961(C)	.7999	0.0429	−0.0239
549		66 33.1	48 28.7	1144(C)	.8491	0.0140	−0.0250
550		66 45.5	48 33.6	1467(B)	.8515	0.0395	−0.0105
551	B.M. M-7	66 46.7	48 36.0	1251(A)	.8686	0.0327	−0.0099
552		66 44.6	48 36.8	1307(B)	.8673	0.0354	−0.0091
553		66 42.6	48 37.3	1213(B)	.8706	0.0291	−0.0122
554		66 42.1	48 38.6	1167(B)	.8807	0.0330	−0.0078
555		66 41.3	48 39.7	1160(B)	.8835	0.0335	−0.0060
556	B.M. M-9	66 39.3	48 40.4	1108(A)	.8871	0.0311	−0.0066
557		66 37.4	48 40.8	1159(B)	.8851	0.0333	−0.0062
558	B.M. M-10	66 35.4	48 41.2	994(A)	.8943	0.0264	−0.0075
559		66 33.8	48 42.5	1432(B)	.8710	0.0424	−0.0064
560	B.M. M-11	66 33.6	48 44.6	1629(A)	.8641	0.0508	−0.0047
561		66 31.6	48 46.1	1365(B)	.8845	0.0442	−0.0023
562		66 00.7	48 47.5	1331(B)	.8922	0.0466	0.0014
563		66 26.8	48 47.9	1610(B)	.8753	0.0553	0.0005
564		66 23.2	48 48.6	1196(B)	.9020	0.0421	0.0014
565	B.M. M-14	66 21.3	48 48.5	961(A)	.9146	0.0327	0.0000
566		66 19.3	48 50.3	1759(B)	.8760	0.0665	0.0065
567	B.M. M-16	66 17.8	48 50.9	1722(A)	.8793	0.0654	0.0067
568		66 15.2	48 51.3	1771(B)	.8827	0.0828	0.0125

Principal Facts for Gravity Stations

Second-Order Stations

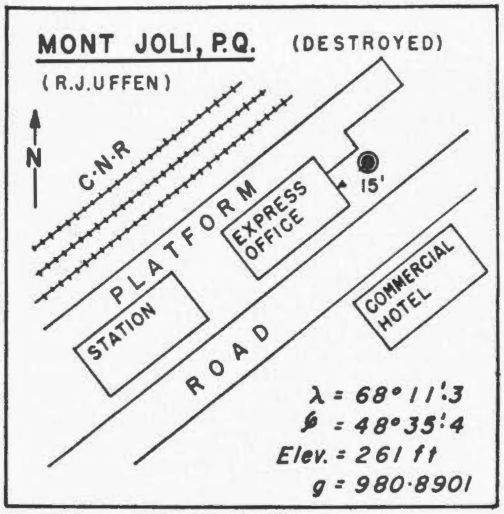
Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
569	B.M. M-16	66 13.0	48 51.5	2213(A)	980.8545	0.0859	0.0105
570		66 10.7	48 50.9	2147(B)	.8515	0.0775	0.0044
571	B.M. M-17	66 10.6	48 49.1	1521(A)	.8775	0.0477	−0.0044
572		66 10.1	48 47.3	1250(B)	.8831	0.0302	−0.0124
573		66 10.4	48 45.4	935(B)	.8945	0.0148	−0.0170
574		67 16.3	48 39.0	334(B)	.9344	0.0077	−0.0037
575		67 12.3	48 37.9	414(B)	.9297	0.0122	−0.0019
576		67 06.8	48 38.0	448(B)	.9347	0.0202	0.0050
577		67 04.0	48 39.7	536(B)	.9350	0.0263	0.0081
578		67 00.9	48 40.3	723(B)	.9284	0.0364	0.0118
579		67 10.1	48 38.0	396(B)	.9359	0.0165	0.0031

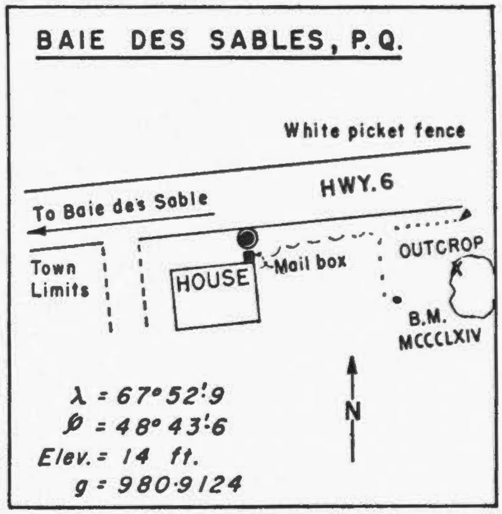
Second-Order Stations—R. J. Uffen, 1954

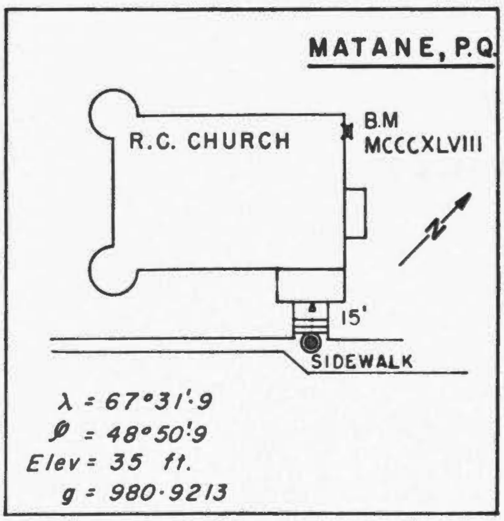
Station No.	Station Name	Longitude	Latitude	Elevation Ft.	Observed Gravity	Gravity Anomalies Free Air	Gravity Anomalies Bouguer
142	Gaspé, P.O.	64° 27!6	48° 49!9	30(A)	980.9942	0.0227	0.0217
143		64 37.7	48 50.4	42(B)	.9887	0.0177	0.0172
144		64 44.4	48 49.8	118(B)	.9711	0.0080	0.0040
145		64 53.6	48 49.8	330(B)	.9541	0.0109	−0.0003
146		64 48.7	48 49.6	204(B)	.9630	0.0083	0.0013
147		65 04.1	48 51.0	634(B)	.9375	0.0212	−0.0004
148		65 00.9	48 48.5	572(B)	.9354	0.0170	−0.0025
149		65 05.3	48 51.2	691(B)	.9365	0.0253	0.0018
150		65 11.2	48 52.1	941(B)	.9243	0.0352	0.0032
151		65 16.0	48 51.5	1396(B)	.8936	0.0482	0.0007
152		65 21.4	48 54.3	1935(B)	.8777	0.0788	0.0129
153		65 24.9	48 55.1	1514(B)	.9006	0.0610	0.0094
154	Gaspé Copper	65 30.6	48 56.5	1876(A)	.8812	0.0736	0.0097
155		65 31.9	48 57.2	2028(B)	.8737	0.0793	0.0102
157		65 36.9	48 56.1	1518(C)	.9035	0.0628	0.0211
159	Ownamin G. Station	65 27.3	48 55.0	1689(A)	.8885	0.0663	0.0079
160		65 31.8	49 02.9	758(B)	.9610	0.0386	0.0128
161		65 31.4	49 05.1	1088(B)	.9527	0.0580	0.0210
162		65 31.1	49 07.6	1063(B)	.9549	0.0542	0.0180
163		65 34.4	49 10.0	223(B)	981.0012	0.0179	0.0103
164		65 36.1	49 12.8	39(B)	.0121	0.0073	0.0059

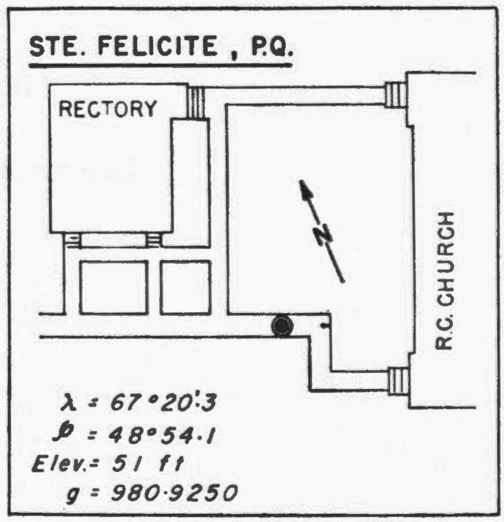
APPENDIX II

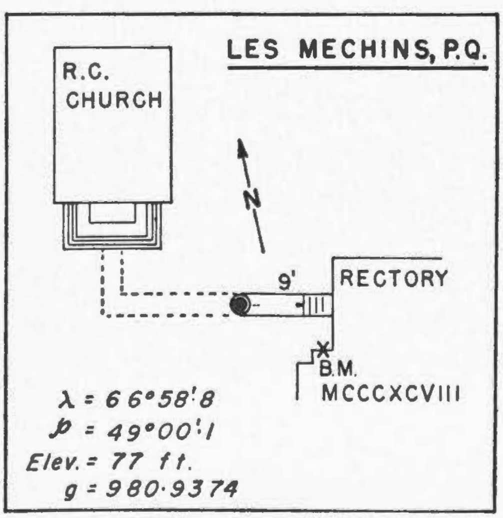
Descriptions of Base Stations

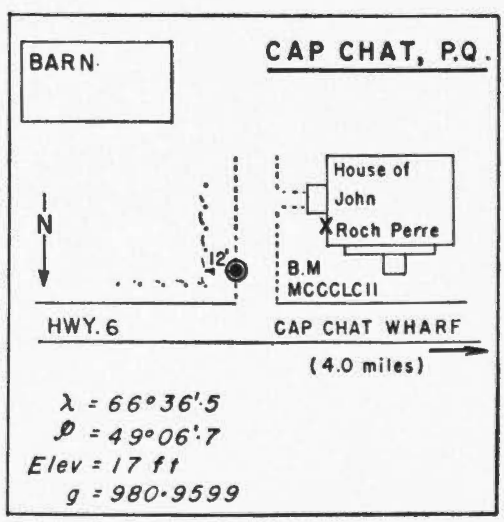

MONT JOLI, P.Q. (DESTROYED)
(R.J.UFFEN)
N
C.N.R
PLATFORM
EXPRESS OFFICE
15'
STATION
ROAD
COMMERCIAL HOTEL
λ = 68° 11'.3
φ = 48° 35'.4
Elev. = 261 ft
g = 980·8901

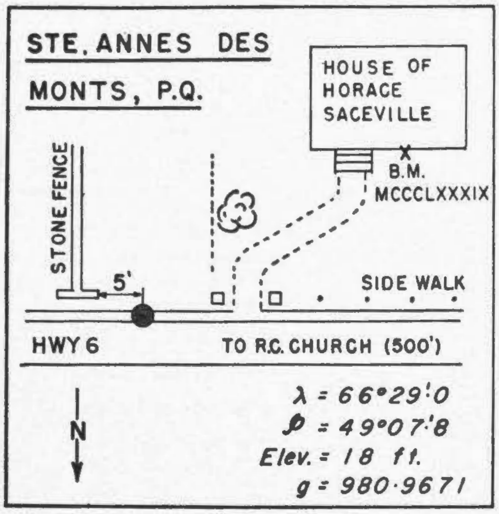

BAIE DES SABLES, P.Q.
White picket fence
HWY. 6
To Baie des Sable
Town Limits
HOUSE
Mail box
OUTCROP
B.M. MCCCLXIV
N
λ = 67°52'.9
φ = 48° 43'.6
Elev. = 14 ft.
g = 980·9124

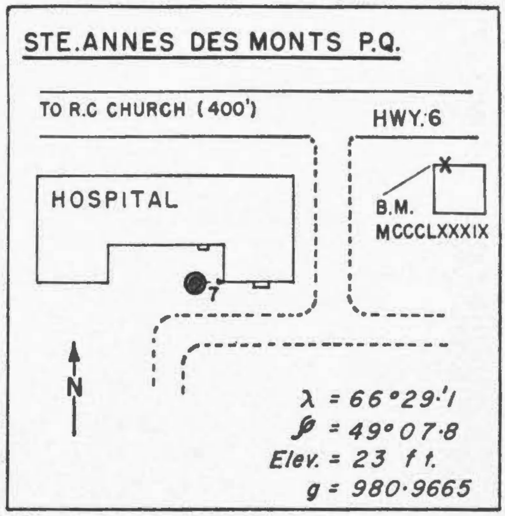

MATANE, P.Q.
R.C. CHURCH
B.M MCCCXLVIII
N
15'
SIDEWALK
λ = 67°31'.9
φ = 48°50'.9
Elev = 35 ft.
g = 980·9213

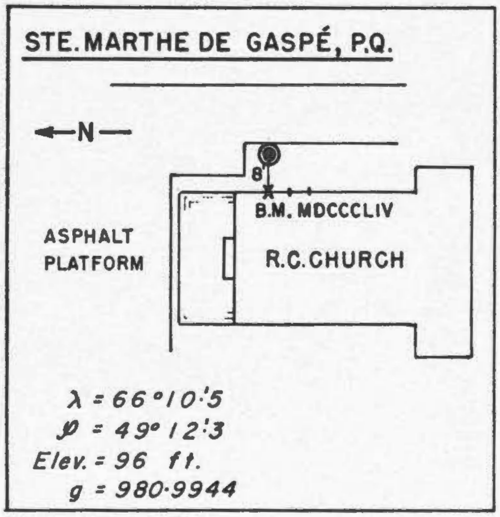

STE. FELICITE, P.Q.
RECTORY
N
R.C. CHURCH
λ = 67°20'.3
φ = 48°54·1
Elev. = 51 ft
g = 980·9250

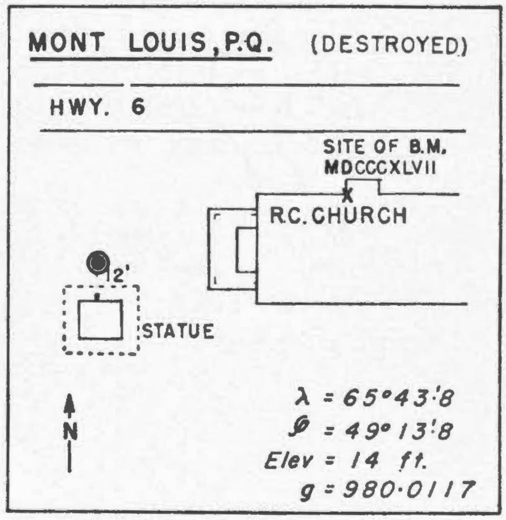

LES MECHINS, P.Q.
R.C. CHURCH
N
9'
RECTORY
B.M. MCCCXCVIII
λ = 66°58'8
φ = 49°00'.1
Elev. = 77 ft.
g = 980·9374

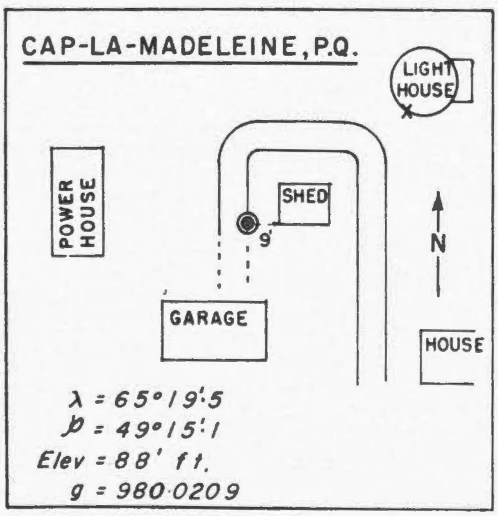

BARN
CAP CHAT, P.Q.
House of John Roch Perre
N
12'
B.M MCCCLCII
HWY. 6
CAP CHAT WHARF
(4.0 miles)
λ = 66°36'.5
φ = 49°06'.7
Elev = 17 ft
g = 980·9599

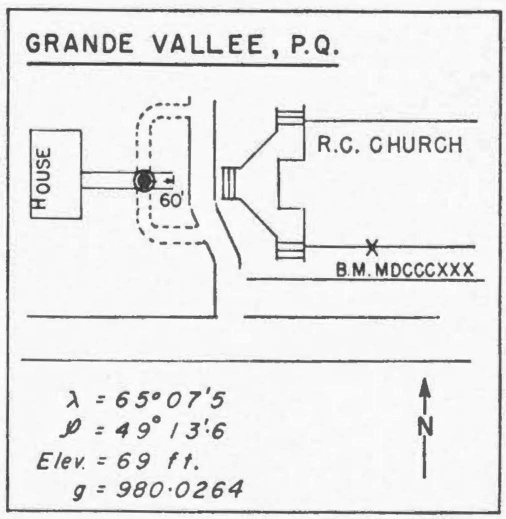

STE. ANNES DES MONTS, P.Q.
HOUSE OF HORACE SACEVILLE
STONE FENCE
B.M. MCCCLXXXIX
5'
SIDE WALK
HWY 6
TO R.C. CHURCH (500')
N
λ = 66°29'.0
φ = 49°07'.8
Elev. = 18 ft.
g = 980·9671

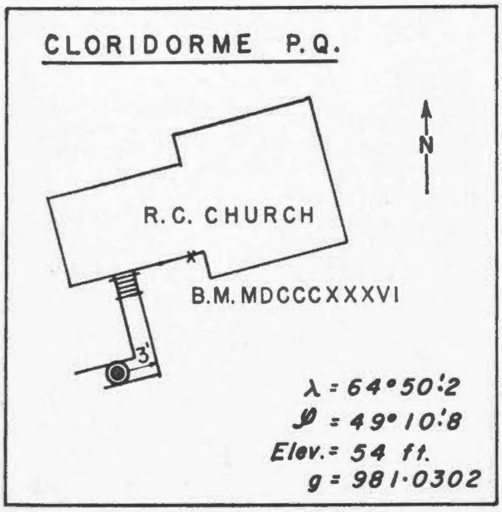

STE. ANNES DES MONTS P.Q.
TO R.C CHURCH (400')
HWY. 6
HOSPITAL
B.M. MCCCLXXXIX
7
N
λ = 66°29'.1
φ = 49°07·8
Elev. = 23 ft.
g = 980·9665

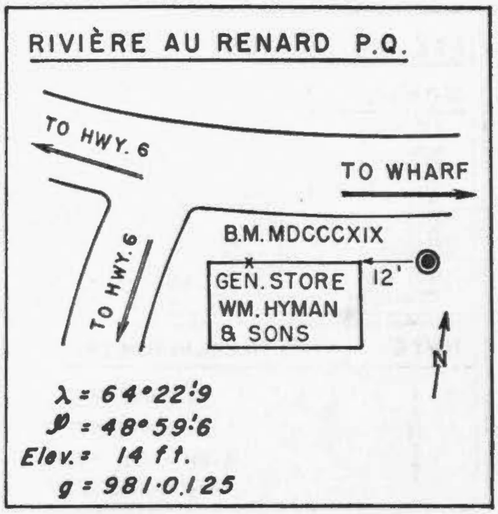

STE. MARTHE DE GASPÉ, P.Q.
N
8
B.M. MDCCCLIV
ASPHALT PLATFORM
R.C. CHURCH
λ = 66°10'.5
φ = 49°12'.3
Elev. = 96 ft.
g = 980·9944

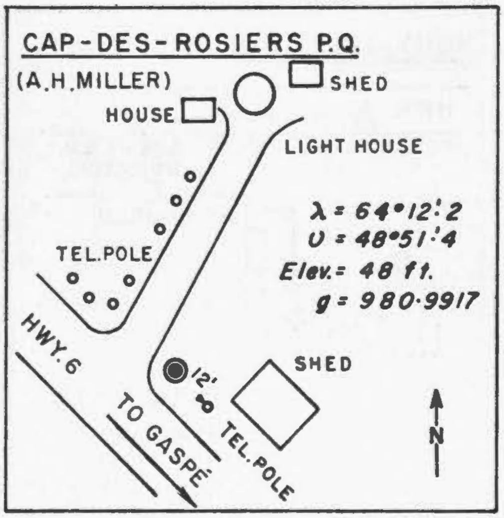

MONT LOUIS, P.Q. (DESTROYED)
HWY. 6
SITE OF B.M. MDCCCXLVII
R.C. CHURCH
12'
STATUE
N
λ = 65°43'.8
φ = 49°13'.8
Elev = 14 ft.
g = 980·0117

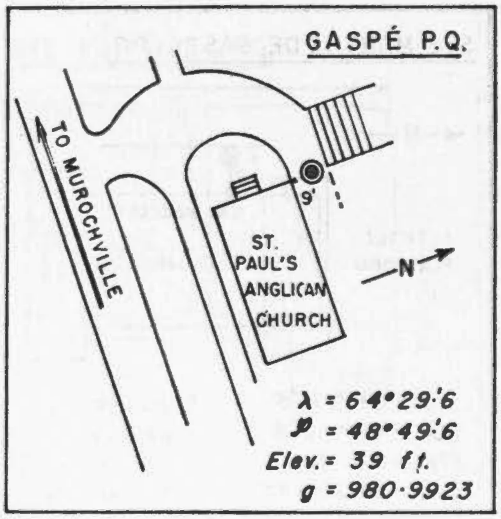

CAP-LA-MADELEINE, P.Q.
LIGHT HOUSE
POWER HOUSE
SHED
9'
N
GARAGE
HOUSE
λ = 65°19'.5
φ = 49°15'.1
Elev = 88' ft.
g = 980·0209

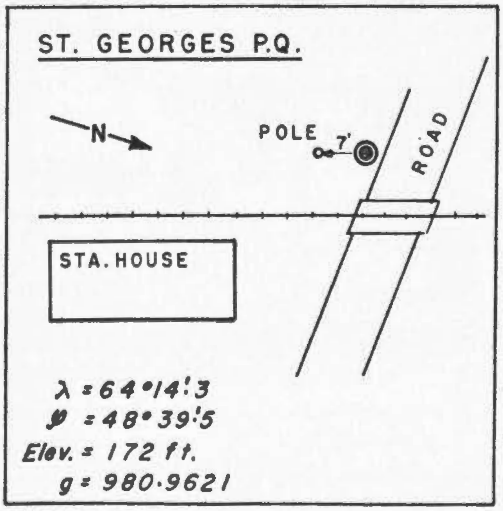

GRANDE VALLEE, P.Q.
HOUSE
R.C. CHURCH
60'
B.M. MDCCCXXX
λ = 65°07'5
φ = 49°13'.6
Elev. = 69 ft.
g = 980·0264
N

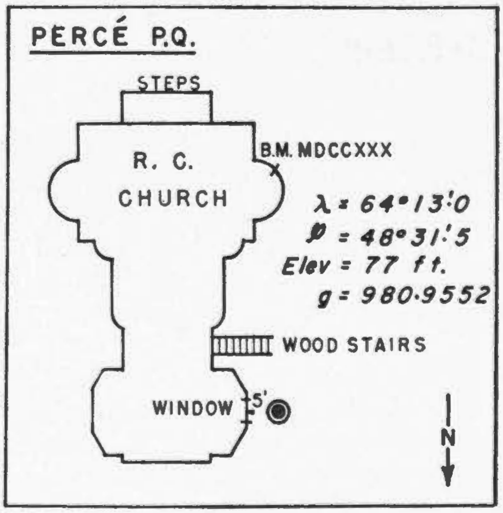

CLORIDORME P.Q.
N
R.C. CHURCH
B.M. MDCCCXXXVI
3'
λ = 64°50'.2
φ = 49°10'.8
Elev. = 54 ft.
g = 981·0302

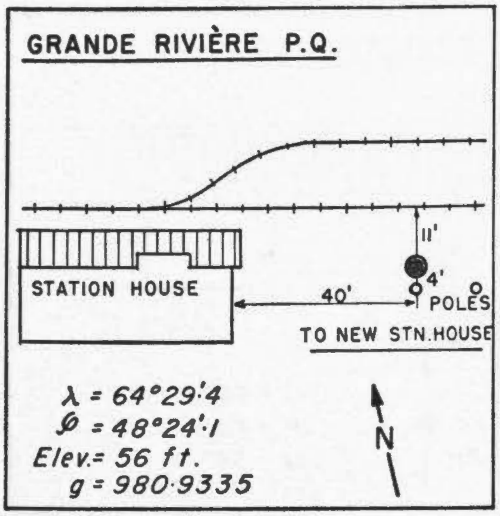

RIVIÈRE AU RENARD P.Q.
TO HWY. 6
TO WHARF
TO HWY. 6
B.M. MDCCCXIX
GEN. STORE
WM. HYMAN
& SONS
12'
N
λ = 64°22'.9
φ = 48°59'.6
Elev. = 14 ft.
g = 981·0.125

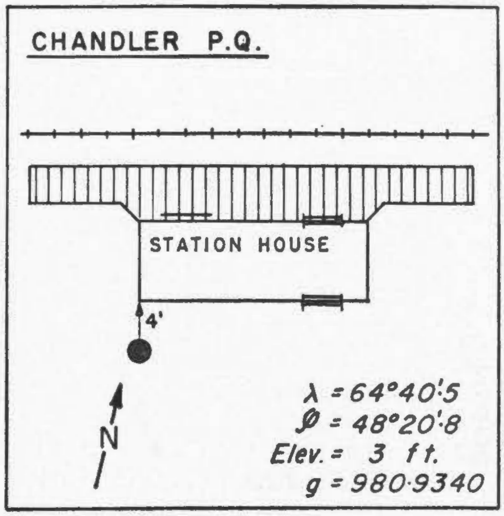

CAP-DES-ROSIERS P.Q.
(A.H. MILLER)
HOUSE
SHED
LIGHT HOUSE
λ = 64°12'.2
υ = 48°51'.4
Elev. = 48 ft.
g = 980·9917
TEL. POLE
HWY. 6
12'
SHED
TO GASPÉ
TEL. POLE
N

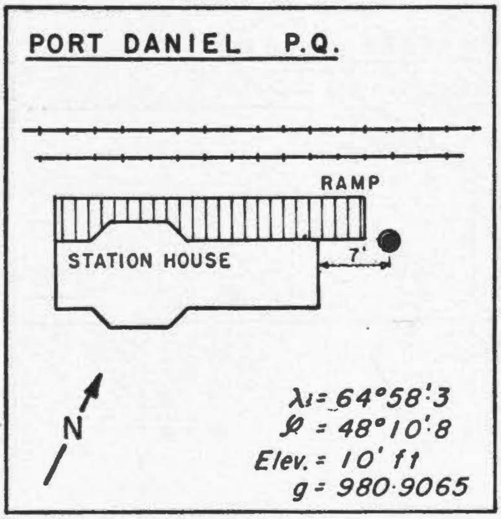

GASPÉ P.Q.
TO MUROCHVILLE
9'
ST. PAUL'S ANGLICAN CHURCH
N
λ = 64°29'.6
φ = 48°49'.6
Elev. = 39 ft.
g = 980·9923

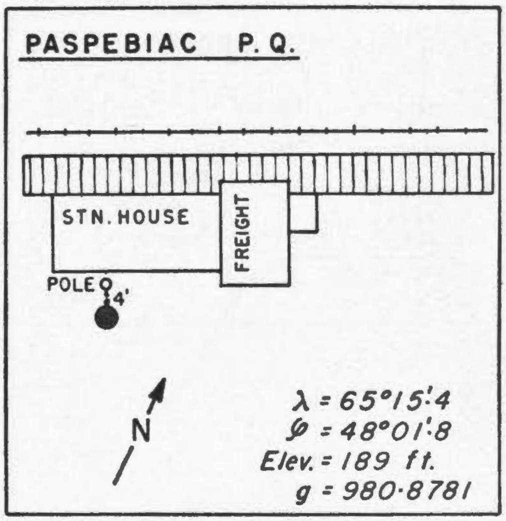

ST. GEORGES P.Q.
N
POLE
7'
ROAD
STA. HOUSE
λ = 64°14'.3
φ = 48°39'.5
Elev. = 172 ft.
g = 980·9621

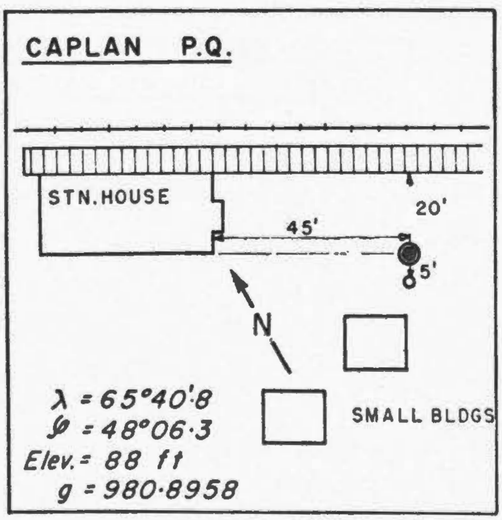

PERCÉ P.Q.
STEPS
R. C. CHURCH
B.M. MDCCXXX
λ = 64°13'.0
φ = 48°31'.5
Elev = 77 ft.
g = 980·9552
WOOD STAIRS
WINDOW
5'
N

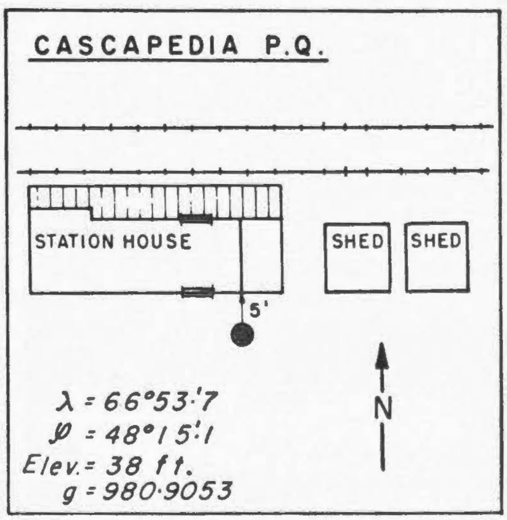

GRANDE RIVIÈRE P.Q.
11'
4'
STATION HOUSE
40'
POLES
TO NEW STN.HOUSE
λ = 64°29'.4
φ = 48°24'.1
Elev.= 56 ft.
g = 980·9335
N

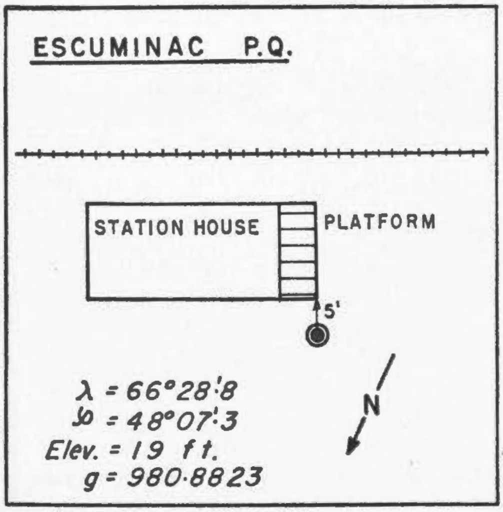

CHANDLER P.Q.
STATION HOUSE
4'
N
λ = 64°40'.5
φ = 48°20'.8
Elev. = 3 ft.
g = 980·9340

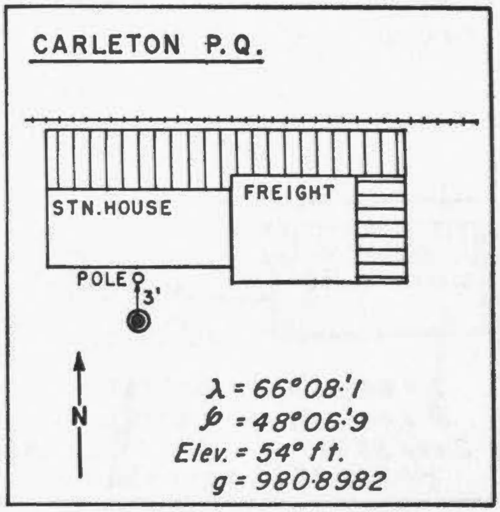

PORT DANIEL P.Q.
RAMP
STATION HOUSE
7'
N
λ = 64°58'.3
φ = 48°10'.8
Elev. = 10' ft
g = 980·9065

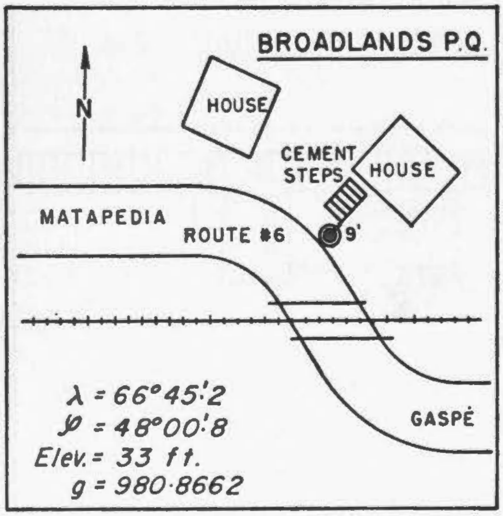

PASPEBIAC P. Q.
STN. HOUSE
FREIGHT
POLE
4'
N
λ = 65°15'.4
φ = 48°01'.8
Elev. = 189 ft.
g = 980·8781

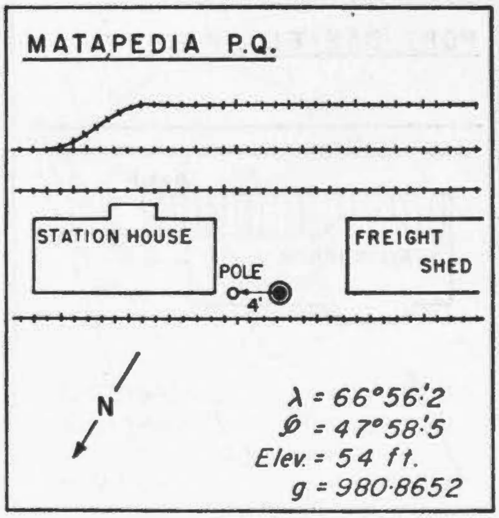

CAPLAN P.Q.
STN.HOUSE
20'
45'
5'
N
λ = 65°40'.8
φ = 48°06·3
Elev.= 88 ft
g = 980·8958
SMALL BLDGS

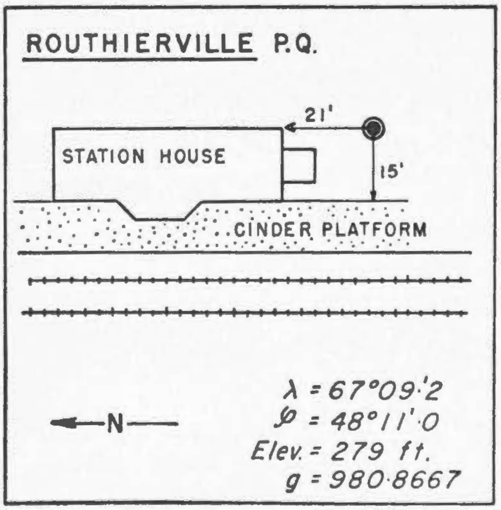

CASCAPEDIA P.Q.
STATION HOUSE
SHED
SHED
5'
N
λ = 66°53'.7
φ = 48°15'.1
Elev.= 38 ft.
g = 980·9053

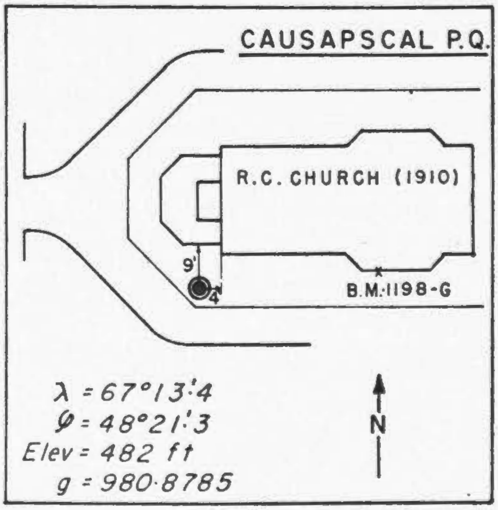

ESCUMINAC P.Q.
STATION HOUSE
PLATFORM
5'
N
λ = 66°28'.8
φ = 48°07'.3
Elev. = 19 ft.
g = 980·8823

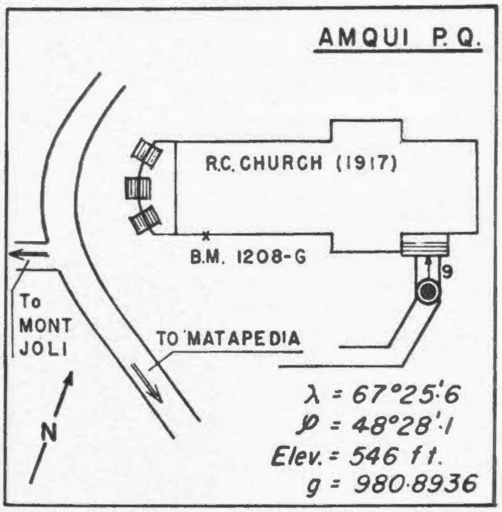

CARLETON P.Q.
STN. HOUSE
FREIGHT
POLE
3'
N
λ = 66°08'.1
φ = 48°06'.9
Elev. = 54° ft.
g = 980·8982

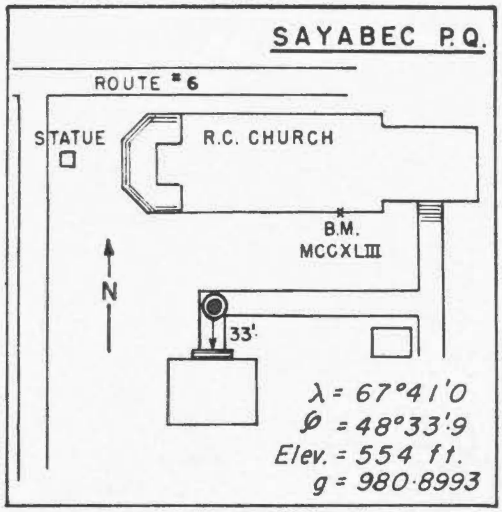

BROADLANDS P.Q.
N
HOUSE
CEMENT STEPS
HOUSE
MATAPEDIA
ROUTE #6
9'
GASPÉ
λ = 66°45'.2
φ = 48°00'.8
Elev. = 33 ft.
g = 980·8662

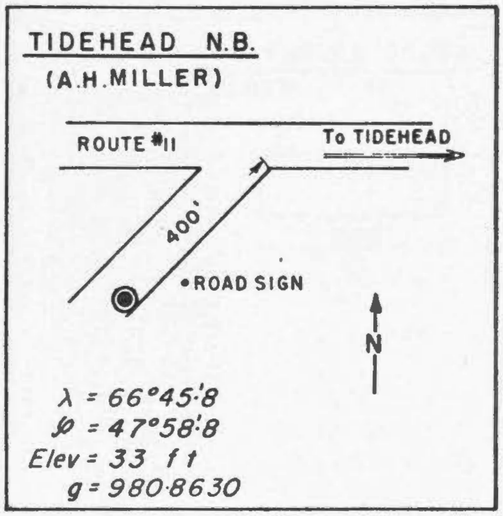

MATAPEDIA P.Q.
STATION HOUSE
FREIGHT SHED
POLE
4'
N
λ = 66°56'.2
φ = 47°58'.5
Elev. = 54 ft.
g = 980·8652

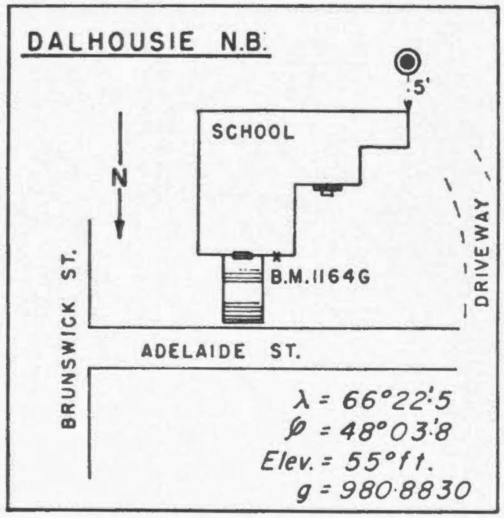

ROUTHIERVILLE P.Q.
21'
STATION HOUSE
15'
CINDER PLATFORM
N
λ = 67°09'.2
φ = 48°11'.0
Elev. = 279 ft.
g = 980·8667

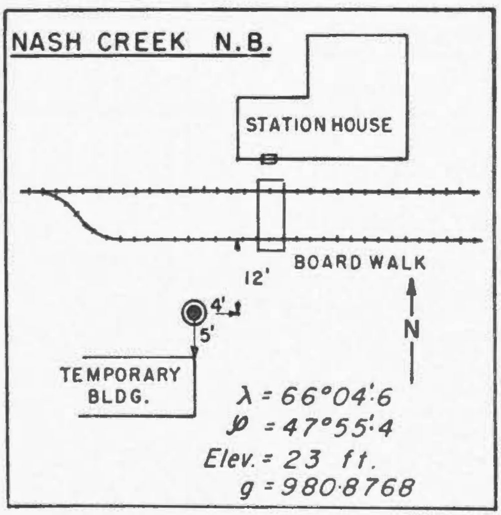

CAUSAPSCAL P.Q.
R.C. CHURCH (1910)
9'
4'
B.M. 1198-G
λ = 67°13'.4
φ = 48°21'.3
Elev = 482 ft
g = 980·8785
N

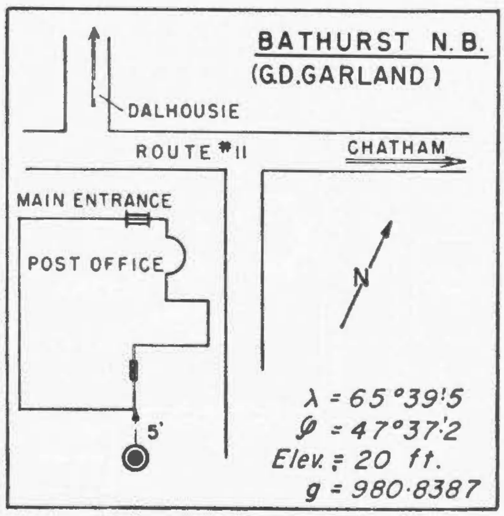

AMQUI P.Q.
R.C. CHURCH (1917)
B.M. 1208-G
9
To MONT JOLI
TO MATAPEDIA
N
λ = 67°25'.6
φ = 48°28'.1
Elev. = 546 ft.
g = 980·8936

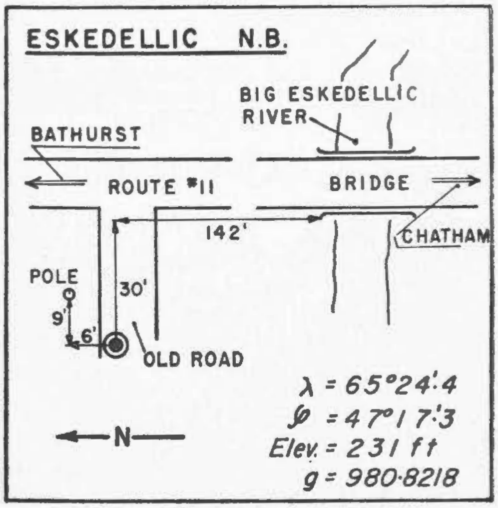

SAYABEC P.Q.
ROUTE #6
STATUE
R.C. CHURCH
B.M. MCCXLIII
N
33'
λ = 67°41'.0
φ = 48°33'.9
Elev. = 554 ft.
g = 980·8993

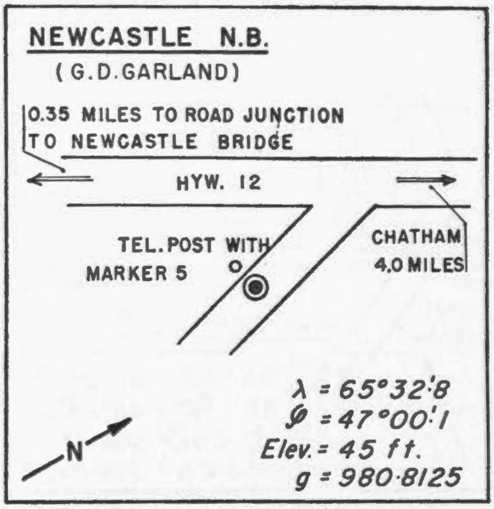

TIDEHEAD N.B.
(A.H. MILLER)
ROUTE #11
To TIDEHEAD
400'
•ROAD SIGN
N
λ = 66°45'.8
φ = 47°58'.8
Elev = 33 ft
g = 980·8630

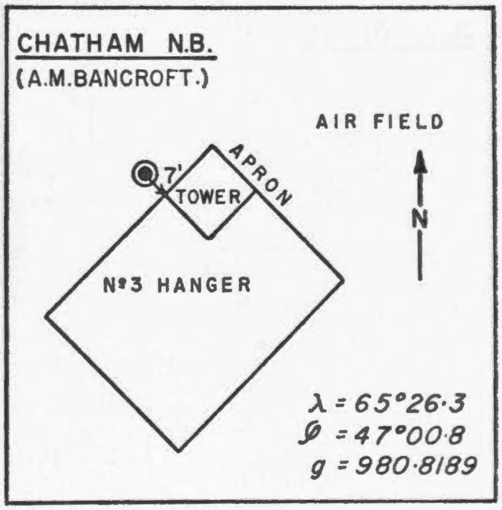

DALHOUSIE N.B.
5'
SCHOOL
N
B.M. 1164G
DRIVEWAY
BRUNSWICK ST.
ADELAIDE ST.
λ = 66°22'.5
φ = 48°03'.8
Elev. = 55°ft.
g = 980·8830

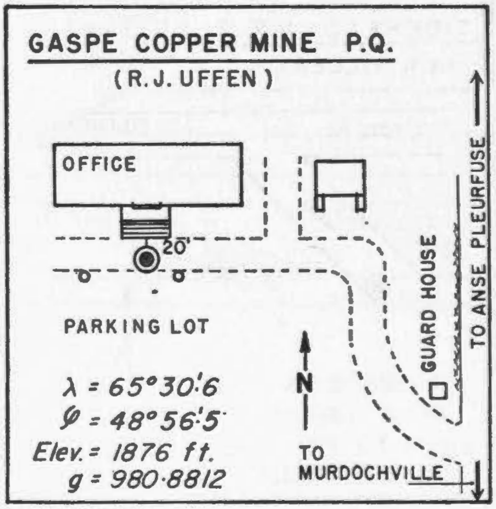

NASH CREEK N.B.
STATION HOUSE
BOARD WALK
12'
4'
5'
N
TEMPORARY BLDG.
λ = 66°04'.6
φ = 47°55'.4
Elev. = 23 ft.
g = 980·8768

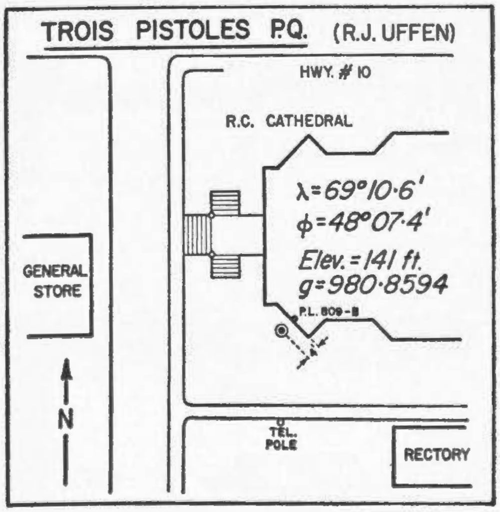

BATHURST N.B.
(G.D. GARLAND)
DALHOUSIE
ROUTE #11
CHATHAM
MAIN ENTRANCE
POST OFFICE
N
5'
λ = 65°39'.5
φ = 47°37'.2
Elev. = 20 ft.
g = 980·8387

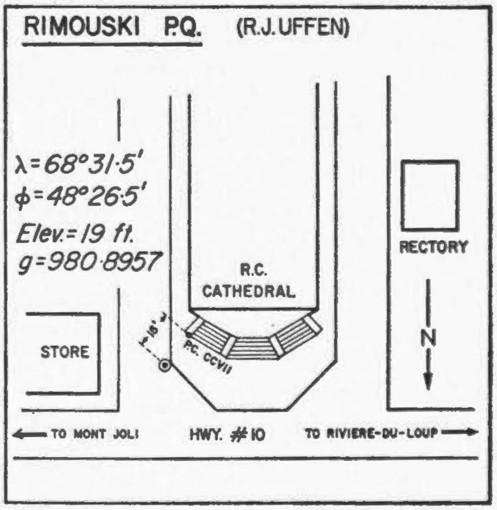

ESKEDELLIC N.B.
BIG ESKEDELLIC RIVER
BATHURST
ROUTE #11
BRIDGE
142'
CHATHAM
POLE
30'
9'
6'
OLD ROAD
λ = 65°24'.4
φ = 47°17'.3
Elev. = 231 ft
g = 980·8218
N


NEWCASTLE N.B.
(G.D.GARLAND)
0.35 MILES TO ROAD JUNCTION
TO NEWCASTLE BRIDGE
HYW. 12
TEL. POST WITH
MARKER 5
CHATHAM
4.0 MILES
λ = 65°32'.8
φ = 47°00'.1
Elev. = 45 ft.
g = 980·8125
N


CHATHAM N.B.
(A.M.BANCROFT.)
AIR FIELD
7'
TOWER
APRON
N
No 3 HANGER
λ = 65°26·3
φ = 47°00·8
g = 980·8189


GASPE COPPER MINE P.Q.
(R.J. UFFEN)
OFFICE
20'
PARKING LOT
GUARD HOUSE
TO ANSE PLEURFUSE
N
λ = 65°30'.6
φ = 48°56'.5
Elev. = 1876 ft.
g = 980·8812
TO
MURDOCHVILLE


TROIS PISTOLES P.Q. (R.J. UFFEN)
HWY. # 10
R.C. CATHEDRAL
λ=69°10·6'
φ=48°07·4'
Elev.=141 ft.
g=980·8594
P.L. 809-B
GENERAL
STORE
N
TEL.
POLE
RECTORY


RIMOUSKI P.Q. (R.J.UFFEN)
λ=68°31·5'
φ=48°26·5'
Elev.=19 ft.
g=980·8957
R.C.
CATHEDRAL
RECTORY
STORE
18'
P.C. CCVII
N
TO MONT JOLI
HWY. # 10
TO RIVIERE-DU-LOUP