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CANADA

DEPARTMENT OF MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

GEOLOGICAL SURVEY
PAPER 40-10

STONY RAPIDS AND PORCUPINE RIVER AREAS, SASKATCHEWAN

BY
G. M. Furnival

OTTAWA
J. O. PATENAUDE, I.S.O.
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
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Preliminary map. Stony Rapids area, Saskatchewan.
Preliminary map. Porcupine River area, Saskatchewan.

Stony Rapids and Porcupine River Areas, Saskatchewan

INTRODUCTION

Stony Rapids area lies east of the east end of Lake Athabaska, between latitudes 59° 00′ and 60° 00′ and longitudes 104° 00′ and 105° 00′. Porcupine River area is of the same size to the east and joins the Stony Rapids area at longitude 105° 00′. The settlement of Stony Rapids is at the west boundary of the western area near the southwest corner. About a quarter of the western area was mapped in 1935 by F. J. Alcock[1]. Field work on which the present report is based was carried on by the writer in 1939.

Stony Rapids is readily accessible by boat or aeroplane from Goldfields, Sask. Regular twice monthly air service is maintained with Stony Rapids from Prince Albert, Sask.

Stony Rapids is the point of departure for many trappers going to the barren lands as far north as the Thelon game sanctuary and east to Klokol and Windy Lakes. The main route through the area to Dubawnt Lake and the barren lands has been described by J. B. Tyrrell.[2] This is by way of Black, Chipman, Bompas (Birch), and Selwyn Lakes. Though this route is still used by the Indians, the trappers use a cut off that takes them directly from the bay at the foot of Woodcock Rapids on Fond-du-Lac River to Chipman River. This reduces the total length of portages from 9 miles to 5½ miles and avoids the crossing of Black Lake. An alternative route to Selwyn Lake from Black Lake is by way of Porcupine River, Jervois Creek, and Pinkham Lake.

Fond-du-Lac River west of Black Lake and for a short distance east of it marks approximately the contact between rocks of the Athabaska series, which underlie the southern part of the areas, and the older formations to the north. South of the river the country is in general drift covered and of low relief, with extensive muskegs and a few gently rounded hills. A 50-foot scarp commonly marks the contact.

North of Fond-du-Lac River and Black Lake the topography is quite rugged by contrast, and the relief is considerable, some hills rising over 500 feet. The average relief diminishes to less than 150 feet as the north and east boundaries of the district are approached. However, it is to be noted that Selwyn Lake is 641 feet higher than Fond-du-Lac at Stony Rapids, which suggests that the ancient Precambrian peneplain has a gentle southward slope. The southwestern part has been deeply incised by erosion, giving rise to the markedly more rugged topography of that region.

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[1] Alcock, F. J.: "Geology of Lake Athabaska Region, Saskatchewan"; Geol. Surv., Canada, Mem. 196 (1936).

[2] "The Doobaunt, Kazan, and Ferguson Rivers"; Geol. Surv., Canada, Ann. Rept. 1896, vol. IX, pt. F, p. 36.

GENERAL GEOLOGY

TABLE OF FORMATIONS

Proterozoic (Late Precambrian)
- Athabaska series: sandstone, pebble conglomerate
- Norite

Archæan (Early Precambrian)
- Granite, porphyritic granite, pegmatite
- Gabbro, amphibolite
- Biotite and biotite-hornblende gneiss
- Tazin group: (a) volcanic rocks
  - (b) garnetiferous quartzite, arkose, greywacke, argillite, conglomerate, and derived garnetiferous gneisses; quartz-biotite and mica-carbonate schists; crystalline limestone, iron formation, tuffs, breccias, and volcanic flows (may include younger sediments).

TAZIN GROUP

Camsell[1] first used the term Tazin series to describe the early Precambrian sediments and volcanics along Tazin and Taltson Rivers. Alcock[2] applied the same term to similar rocks along the shores of Lake Athabaska, but recognizing that these may represent more than one series of rocks he changed the term to Tazin group. This term is applied here to all sediments and volcanics older than the gabbro and massive pink granite, and of course may include rocks younger than Tazin. Rocks of this group occur most abundantly in the western area and underlie about 15 per cent of the combined areas.

Sediments

The sedimentary rocks of the Tazin group are garnetiferous quartzites, arkoses, greywackes, argillites, and conglomerates, all considerably altered. These rocks have been recrystallized and impregnated by granitic material. Crystalline limestones, mica-carbonate, and interbanded quartz-biotite schists occur in small amounts, but are widespread. Iron formation was seen at one place.

These rocks are distributed in three main belts. One belt extends from the west border of the district east of Bompas Lake and lies south of Grease River and Chambeuil Lake. The sediments of this belt consist predominantly of recrystallized quartzites. They are generally light grey to buff coloured, although some are dark brown, purple, and yellowish. Some have considerable carbonate. Commonly thin bedded, they occur in thick, massive beds south of Reeve Lake, where they contain occasional boulders up to 18 inches across. Bands of pebble conglomerates occur in some places. Current crossbedding was observed at two places. With increase in dark-coloured minerals the quartzites grade into thinly bedded, dark greywackes. Thick beds of light pink to red arkose are present at many places. In addition to the conglomerates mentioned above, are

[1] Camsell, Charles: "An Exploration of the Region Between Athabaska and Great Slave Lakes, Alberta and Northwest Territories"; Geol. Surv., Canada, Sum. Rept. 1914, pp. 58-59.

[2] Alcock, F. J.: "Geology of Lake Athabaska Region, Saskatchewan"; Geol. Surv., Canada, Mem. 196, p. 10 (1936).

conglomerates along the southwest arm of Reeve Lake. These are highly altered by the injection of granitic material and cut by dykelets of pegmatite and granite. Boulders are rounded, range in size up to 2 feet across, and are poorly sorted. The boulders are so much altered that the original rock types cannot be ascertained.

Thinly banded argillites are widespread and alternate with the above-mentioned rocks. They vary in colour from almost white to dark green, chocolate brown, and dark grey. Finely banded, acid and basic tuffs are common and become prominent towards the east end of the belt. At places bands of mica-carbonate schists, tremolite-rich rocks, biotite schists, thin volcanic flows, and agglomerates are interbanded with the foregoing rocks.

Graphite is very widespread in the sediments, and particularly in the quartzites. It occurs as flakes and shreds parallel to the bedding planes.

These rocks are all metamorphosed. They have been recrystallized and impregnated in varying degree by white, granitic material. In all the rocks are metacrysts, as much as three-quarters inch long, of common hornblende, grey to white plagioclase feldspar, and red to pink garnet.

The sediments pass transitionally, both along their strike and across it, into biotite and biotite-hornblende paragneiss. In this change the metacrysts of hornblende and garnet are replaced by biotite and the rock undergoes more advanced recrystallization.

A second belt of sediments extends from the southwest end of Dodge Lake to east of Grollier Lake. These sediments are similar in character to those south of Grease River, but in general have been more thoroughly impregnated by quartz and white, granitic material, commonly in lit-par-lit fashion. In addition to garnet, sillimanite has been extensively developed. A prominent member is a light blue, recrystallized, garnetiferous quartzite. Some carbonate-rich rocks are present, and graphite is abundant throughout the belt.

Several small areas of the metamorphosed garnetiferous sediments are present in the vicinity of Seguin, Shagory, Yotin, and Pascal Lakes. In these areas garnetiferous quartzites predominate. On the east side of Yotin Lake is a garnetiferous blue quartzite similar to that found in the Dodge Lake-Grollier Lake belt. Sillimanite is widespread. These sediments have been intruded to a considerable extent in lit-par-lit fashion by coarse, granitic material composed mainly of white feldspar and quartz.

Along the west shore of Black Lake and east of a prominent fault is a narrow belt of sediments composed of finely banded, acid and basic tuffs, brown mica-carbonate rocks, banded, serpentinized rock, and mica schists.

Crystalline limestones were found along the south shore of the north part of Spreckley Lake, and on the points and islands in the middle of Charlebois Lake. These are interbanded with biotite and muscovite schists.

Iron formation occurs in a small belt of metamorphosed sediments south of Pinkham Lake.

Volcanic Rocks

Only one narrow belt of volcanic rocks is present in the district. It lies near the middle of the western area, is about 2 miles wide, and extends approximately 20 miles in an east-northeast direction.

The volcanic rocks outcrop in high, prominent ridges, which overlook the comparatively low country to the north and east.

Comparatively fresh andesite porphyries and basalts predominate. They are dark green to black, fine-grained to very dense rocks with scattered phenocrysts of white to light brown feldspar, as much as one-quarter inch long, and in places phenocrysts of hornblende of a similar size. Flow structure is well developed in the lavas, but pillow structure was rarely observed. Some light-coloured rhyolites are present. Acid and basic, finely banded tuffs occur in varying proportions, and although intercalated with the lavas have their largest development along the borders of the belt. Some sediments were found in the belt of volcanic rocks west of Chambeuil Lake.

Along the southern border of the belt a group of finely banded, acid and basic tuffs lie between the volcanics and the garnetiferous sediments to the south. At the contact with the sediments, the tuffs are intercalated with thinly bedded sediments, mainly cherty quartzites and argillites. Some thin lava flows are present within garnetiferous sediments south of the main belt of volcanics. This succession is well exposed at the east end of Day Lake. Although the direction to which the tops of the beds face was indeterminable here, the dips average about 75 degrees north and the volcanics structurally overlie the sediments.

Along the northern border of the belt the volcanic rocks pass into little metamorphosed, finely banded, acid and basic tuffs, and thence by gradation into highly metamorphosed tuffs in which the minerals are mainly biotite, hornblende, quartz, and feldspar. Farther north are biotite and hornblende-biotite gneisses, which are well banded. Dark-coloured bands containing a high percentage of biotite and hornblende alternate sharply with light-coloured bands that contain a relatively small amount of these minerals. Such banded gneisses are believed to be paragneisses. The dips at the north border of the belt vary from 18 degrees to 75 degrees north.

North of the west end of Day Lake the flows and associated tuffs have been highly metamorphosed and in places foliated. Hornblende is extensively developed, and metacrysts of hornblende three-quarters inch long were observed. Some of the more basic rocks, particularly the basic tuffs, have been converted to banded amphibolites. Massive granite dykelets crosscut the foliation and banded amphibolites.

BIOTITE AND BIOTITE-HORNBLENDE GNEISSES

A complex of granitoid gneisses underlies about 35 per cent of the area. Most of them are grey; some are buff or red. They contain quartz, biotite, hornblende, plagioclase, and orthoclase. Their minerals exhibit recrystallization textures, and biotite commonly occurs in rosettes of radiating fibres and is apparently largely secondary.

It was not possible over most of the district to determine whether the biotite and biotite-hornblende gneisses were derived from sediments or from rocks of igneous origin. However, in certain places where they exhibit marked interbanding of dark, basic bands with light-coloured, acid bands, and were found to pass transitionally along their strike and across it into rocks of sedimentary origin, the gneisses have been mapped as paragneisses. One belt of such rocks extends from the east end of Clut Lakes northeast to Kaskawan Lake. Another belt lies north of Grease River and Chambeuil Lake and extends from southwest of Astrolabe Lake northeast to Pascal Lake, more or less enclosing the sedimentary rocks of Dodge, Grollier, Seguin, Shagory, and Yotin Lakes.

Several small areas of biotite and biotite-hornblende gneisses with a granitoid texture are more uniform in mineral composition. They are not banded, but have a gneissec texture which is due to a parallelism of the longer dimensions of certain of their minerals. It is considered that these bodies may represent foliated instrusives, and for this reason they have been mapped separately. Such gneisses occur south and west of Duplex Lake, east of Hawkes Lakes, north of Faraud Lake, west of Lafferty Lake, west of Puzzle Lake, about Knowles Lake, east of Dodge Lake, and north of Breynat Lake.

Supporting the possibility that such gneisses may be foliated intrusives, is the presence of dykes and small masses up to 75 feet wide of foliated, fine- to medium-grained granite and syenite in biotite schists and mica-carbonate rocks of the Tazin group. On the west side of Black Lake and south side of the east arm of Spreckley Lake the foliated granite and syenite is clearly intrusive into such rocks.

Massive, pink, biotite granite intrudes the gneisses at the northeast corner of the eastern area and along the southeast and east margins of the main area of gneisses. Approaching the contact with the massive granite, the gneisses in places have been invaded both along and across their banding and foliation planes by the massive pink granite. Dykes of the granite cut across the foliation of the gneisses, dividing the gneisses into large blocks. As the granite is approached more closely the penetration of the gneisses becomes more advanced. Angular fragments of all sizes of the gneiss may be seen in a matrix of massive, pink, biotite granite, which in places penetrates the fragments along foliation planes and bands. In the granite only ghost-like patches, generally angular, remain as last vestiges of the intruded gneiss. These are distinguished by a slightly finer texture, a slightly larger percentage of dark minerals, and less resistance to weathering. The variation in width of this contact zone is considerable, and is probably due to gentle but variable dips of the contact. The zone in places is a mile or more wide.

GABBRO, AMPHIBOLITE

Small masses of altered gabbro or amphibolite are widespread in the district. These are dark brown weathering, dark green, medium- to coarse-grained rocks, with in general a well-developed foliation. These bodies occur as dykes and sills, commonly lenticular in shape, as much as 30 feet across and some at least 150 feet long.

They are composed of hornblende, altered augite, labradorite, quartz, biotite, and magnetite, which is commonly in skeletal crystals. Vermicular intergrowths of quartz and feldspar are present in some. A specimen taken from one sill was found to be composed largely of augite. Some are almost completely recrystallized, others much less so. Sills and dykes in garnetiferous rocks are themselves highly garnetiferous. However, in one case in which an amphibolite mass intrudes biotitic sediments and in another where it intrudes a biotite-hornblende paragneiss, the amphibolite or gabbro bodies are not garnetiferous.

The gabbro and amphibolite intrude the metamorphosed garnetiferous sediments and in general parallel their bedding. However, in detail their contacts and branching dykes cut across the banding in the sediments. A well-defined textural gradation from coarse in the middle to fine at the contacts was observed in a few cases. Where these bodies occur in the gneisses, their relations are not so clear. Some of the finer grained masses may be metamorphosed volcanics. However, at the foot of Woodcock Rapids and elsewhere, dykes 3 feet wide cut across the banding and foliation of biotite-hornblende gneisses. Dykes of massive, white to pink, biotite granite and pegmatite crosscut the gabbro and amphibolite dykes and sills in both the gneisses and the metamorphosed sediments.

GRANITE

Granite is the prevalent rock in the eastern area north of the Athabaska formation. In the northwest corner of the western area, granite, which is a part of a large mass lying to the west, intrudes the gneisses. A small body, about 3 miles across, intrudes the sediments and gneiss south of the east end of Clut Lakes.

These bodies of granite consist in general of massive, pink to white, biotite granite composed of orthoclase, microcline, oligoclase, quartz, and biotite. Local variations in colour and texture are general near remnants of intruded rocks, and are probably in large part due to assimilation. In places the granite is almost white. The texture varies from coarse to coarsely porphyritic, with phenocrysts of orthoclase and microcline three-quarters inch across.

A large amount of pegmatite and some fine-grained, pink aplite are associated with this granite. The pegmatite forms dykes and masses as much as 100 feet across and a half mile or more long. It is white to pink and has generally a coarse texture, with crystals of feldspar several inches across. The mineralogy of the pegmatite is simple. It is composed of white to pink orthoclase and microcline, albite, quartz, and biotite. Graphic intergrowths of quartz and feldspar are common. Many pegmatites have scattered small crystals of red garnet and some have small quantities of specular hematite.

The granite and its associated pegmatite intrude the rocks of the Tazin group, the gneisses, and the gabbro or amphibolite dykes and sills. On the south side of the east arm of Spreckley Lake small dykes of a fine- to medium-grained, foliated granite that intrude biotite schists are themselves cut by dykes of massive, coarse-grained, pink, biotite granite.

Although this is the only place that the massive, pink, biotite granite was found in actual contact with a foliated granite or other orthogneiss, it supports the suggestion made previously that there has been an early period of igneous intrusion, possibly culminating in the widespread intrusion of basic dykes and sills, which are now altered largely to amphibolite.

Alcock[1], in describing the post-Beaverlodge granites in the vicinity of Goldfields, observes that "farther east on Bulyea and Fontaine Lakes are. . . areas of massive granites that may likewise be post-Beaverlodge. Since, however, no Beaverlodge sediments by means of which they might be dated occur, they have been mapped with the older granite-gneisses." The Fontaine Lake mass is only 12 miles west of Stony Rapids. It is possible, therefore, that the massive, pink, biotite granites of the Stony Rapids district are equivalent in age to the post-Beaverlodge granites at Goldfields. In support of this view is the evidence that the massive, pink, biotite granite intrudes and is younger than the gabbro and amphibolite dykes and sills. Lithologically similar sills and dykes of altered gabbro occur in the vicinity of Goldfields. These, Alcock[2] found, intrude the sediments of the Beaverlodge series.

The massive pink granite, on the other hand, may be the equivalent of the post-Tazin granite in the Goldfields area, in which case the altered gabbro and amphibolite would belong to a much older series of basic intrusives than that described by Alcock in the Lake Athabaska region to the west.

H. C. Cooke[3], however, has presented evidence to support his view that the gabbro and amphibolite intrusives at Goldfields intrude Alcock's post-Beaverlodge granite.

NORITE

A large area northwest of Stony Rapids is underlain by norite. This is part of a belt that extends for 25 miles west of Stony Rapids. Only the eastern end of this belt was examined by the writer.

The rock is dark brown on fresh surface and varies greatly in texture from fine-grained to very coarse-grained, and in some places porphyritic. Fine- to medium-grained norite was found to intrude coarse-grained norite, and for this reason the mass appears to be a composite intrusive. The rock consists of labradorite, augite, hypersthene, biotite, quartz, and magnetite.

The norite intrudes the metamorphosed sediments in an intimate manner, generally parallel to the bedding. The areas mapped as norite are those in which norite predominates.

At least three other small bodies of norite are known to occur in the western area. These are at the north end of Chipman Lake, on a lake just south of Kaskawan Lake, and on Breynat Lake.

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[1] Alcock, F. J.: "Geology of Lake Athabaska Region, Saskatchewan"; Geol. Surv., Canada, Mem. 196, pp. 20-21 (1936).

[2] Alcock, F. J.: Op. cit., p. 18.

[3] Cooke, H. C.: "Goldfields Area, Saskatchewan"; Geol. Surv., Canada, Prel. Rept. 37-3, 1937.

The relations of this rock to the massive pink granite are not known definitely. However, it is not foliated and has not been found to be intruded by either the massive pink granite or by pegmatite. On the basis of this negative evidence it is, therefore, tentatively regarded as younger in age than the massive granite.

ATHABASKA SERIES

The Athabaska series underlies almost the entire southern part of the district, south of Fond-du-Lac River and Black Lake. It is represented there chiefly by a sandstone formation with thin bands of pebble conglomerate.

The sandstone is white to buff to reddish and consists almost entirely of subangular to somewhat rounded quartz grains. In places there are thin bands of pebble conglomerate holding subangular to slightly rounded pebbles of quartz as much as one-half inch across. Crossbedding is common. The formation is generally flat lying.

The Athabaska series was found by Alcock[1] to overlie unconformably the post-Beaverlodge granite and older sediments in the Goldfields area. He regards the series as Proterozoic in age. The undisturbed character of the sandstone near the large intrusive of norite at Stony Rapids suggests that it is post-norite in age.

STRUCTURE

The general structural trend in the area is east-northeast. The sediments and volcanic rocks of the main belt south of Grease River and Chambeuil Lake strike east-northeast and mainly dip at moderate to steep angles northwest. The metamorphosed character of the rocks obscures evidence regarding the tops and bottoms of beds and flows, so that the structure cannot be worked out in detail.

Local divergences from the general trend occur, as south of Clut Lakes, where the sediments swing south about a stock of granite and form an open anticline plunging at a low angle southwest. Cross folding of the sediments has occurred in the vicinity of Dodge, Grollier, and Seguin Lakes where the sediments have a northwesterly trend.

The foliation and banding of the gneisses have in general a northeast trend except east of Bompas Lake and east of Hawkins Lake where the foliation swings to a northerly trend.

A strong zone of faulting extends northeast along the west side of Black Lake to Bompas Lake and thence east of Selwyn Lake. West of this line of faulting the rocks are largely metamorphosed sediments and volcanic rocks, whereas to the east they are granite and gneiss.

In contrast with many areas of the Precambrian in which dips are steep to vertical, in the Stony Rapids district they are low to moderate. The metamorphosed sediments have average dips of 45 to 50 degrees. The foliation and banding of the gneisses, even in areas predominantly granite, in many places are horizontal and in general dip at low to moderate angles. Vertical dips are exceptional. Only in the belt of volcanic rocks along Grease River and Chambeuil Lake are dips in general steep.

[1] Alcock, F. J.: Op. cit., pp. 21-24.

ECONOMIC GEOLOGY

The district in general has not been thoroughly prospected. Aside from the main routes to the barren lands, few portages were found cut. Evidence was seen of winter travelling in some places, presumably by trappers. On the other hand, about 75 per cent of the district is underlain by Athabaska sandstone, granite, and gneiss, rocks generally unfavourable as hosts to ore deposits. Part of the remaining 25 per cent received considerable attention from prospectors a quarter of a century ago. This is the area northwest of Stony Rapids, which is underlain by norite.

Although a few claims had been staked as early as 1910, it was not until 1915, when a false rumour of a silver find was spread, that a large number of prospectors visited the district, most of whom failed to stake any claims. Sporadic prospecting for copper-nickel deposits, since then, resulted in 1929 in the finding of a sulphide deposit on the east side of Axis Lake about 8 miles northwest of Stony Rapids. The deposit was trenched and diamond drilled in 1929 and 1930 by Dominion Explorers, Limited, but has since remained idle. So far as could be learned at Stony Rapids very little prospecting has been done in the district since that time.

GOLD

Though no gold deposits have been reported in the district examined, some gold-bearing quartz veins, with arsenopyrite, have been staked and investigated at Sucker Bay on Lake Athabaska, 20 miles west of the Stony Rapids area. These deposits occur in metamorphosed garnetiferous sediments, which are continuous with and on the strike of those lying south of Clut Lakes. Although these deposits have not yet been proved to be of commercial value they indicate that gold-bearing solutions have circulated through the metamorphosed garnetiferous sediments in places, and may, given favourable conditions, form deposits of commercial value.

It is of interest to note here, as pointed out previously, that the body of granite south of the east end of Clut Lakes may be of the same age as the post-Beaverlodge granites in the Goldfields district, in which the gold deposits at Goldfields occur and to which Alcock[1] believes they are related. However, this granite differs from the granite bodies at Goldfields in that it is surrounded by a zone, about 2 miles wide, of gneisses into which the granite is intrusive; whereas the granite bodies at Goldfields are in direct contact with metamorphosed sediments. There is, furthermore, considerable lithological difference in the rocks composing these stocks. That south of Clut Lakes is similar to the granite that forms large batholiths in the district, whereas the gold-bearing stocks and sills at Goldfields are quite different from the batholithic granite. By this is implied that, if these granites are related, then the stocks at Goldfields by virtue of their mineralogical difference are probably minor differentiates whereas that south of Clut Lakes is more likely to be the top of a large body or batholith of granite rather than a small stock. The flat dips of the sediments away from the granite to the southwest support this inference.

[1] Alcock, F. J.: Op. cit., pp. 25-26.

Although few quartz veins were found in the belt of volcanics along Grease River, these rocks cannot be eliminated as a host for gold deposits and should be prospected.

COPPER AND NICKEL

Alcock[1] states that pyrrhotite, chalcopyrite, and arsenopyrite are widely disseminated in the norite and garnetiferous sediments at the west end of the norite belt in the vicinity of Camille Bay, but nowhere appear to be sufficiently concentrated to form ore-bodies. Similar local disseminations were observed in the rocks north of Stony Rapids, and in particular on Axis Lake.

The deposit on the east side of Axis Lake occurs in a fracture zone in fine-grained norite that intrudes metamorphosed garnetiferous sediments. The zone strikes east, dips about 70 degrees south, and has been trenched for a length of 1,200 feet. Sulphides are disseminated across widths in excess of 20 feet. Within the zone the rocks have been chloritized, silicified, and replaced by magnetite, pyrite, pyrrhotite, and chalcopyrite. Chalcopyrite is most abundant at the east end of the zone.

In view of the fact that solutions bearing base metals have circulated through the norite and the adjacent garnetiferous sediments and gneisses, all these rocks should be carefully prospected. At least one producing base metal mine is operating on a copper deposit that occurs in similar garnetiferous sediments, gneisses, and amphibolites, namely the Sherritt-Gordon mine. It should be further noted that bodies of norite similar to that at Stony Rapids, but much smaller, have been found elsewhere in the district.

GRAPHITE

Graphite is widely disseminated in small amounts in most of the sediments throughout the area. The graphite occurs as flakes and narrow shreds along and parallel to bedding planes in the sediments. At several places local concentrations of graphite occur, and in 1937 claims were staked on some of these, lying between Dodge and Grollier Lakes. Some assessment work was performed, but the deposits failed to prove of commercial value.

[1] Alcock, F. J.: Op. cit., p. 34.