Photo 18. Moderately to thickly bedded, beige to grey quartzite in the lower part of unit Ꞓs east of Split Top Mountain. These rocks become volumetrically important in the lower parts of this unit in the southern part of the map area and, together with unit Ꞓsq, constitute the main lithology.

the Middle to Upper Cambrian carbonate shale-out in the extreme northeastern part of the map area.

This unit is poorly exposed north and west of Netson Lake, allowing only general descriptions. It is dominated by noncalcareous slate, slaty siltstone and sandstone, with only minor quartzite and limestone. Slate and slaty siltstone are usually medium to dark grey to olive green, and locally have thin colour laminations. The rocks are fine grained, although laminae of paler grey, coarse siltstone or sandstone are quite common. Medium-grained flakes of mica are clearly visible on some cleavage surfaces, which weather a rusty brown colour. These micas, the sandy laminae, and worm trails on some surfaces, are useful in distinguishing these slates from those of younger units in the region.

Sandstone, where present, generally forms intervals or interbeds within the slates. It is pale to dark grey, medium grained, micaceous, locally feldspathic, and usually forms well and thinly bedded (1 to 10 cm) outcrops with flaggy to platy partings. Bedding planes are commonly undulose, suggesting rippled surfaces. Locally, larger bodies or beds of white to grey quartzite or feldspathic quartzite are associated with the sandstones and slates. Rarely, thin beds of oolitic or argillaceous limestone are present.

Southeast of Graveyard Lake, the Cambrian is characterized by well cleaved, thinly interlayered brown to rusty weathering, laminated to banded or mottled, pale to dark grey micaceous slate, siltstone and grey to maroon, very fine sandstone to quartzite. Sandstone and quartzite make up to 30 per cent of the section and beds may reach several metres in thickness. Isolated outcrops of grey-weathering, pale to medium grey, fine to medium crystalline, massive to platy limestone in the southeastern part of the map area are grouped with the Cambrian succession as they are found along strike with siliciclastics of this package.

Cambrian clastics on the south and east sides of Chee Mountain resemble the upper Road River Group, but are generally coarser and contain a larger siliceous component (Photo 19). Assignment of these rocks to the Cambrian is still questionable. They consist predominantly of thinly to thickly interlayered, laminar, orange to brown-weathering, greenish grey, dolomitic to calcareous siltstone and grey to black slate to shale. Siltstone is locally bioturbated, and may form up to 70 per cent of the section. In addition, orange to brown-weathering, grey to dark grey, thick-bedded micaceous sandstone forms sections up to 10 metres thick. Clasts are very fine to fine grained, and composed of quartz and minor dark grey argillite. Sandstone typically shows laminar bedding, and locally it displays low-angle or ripple

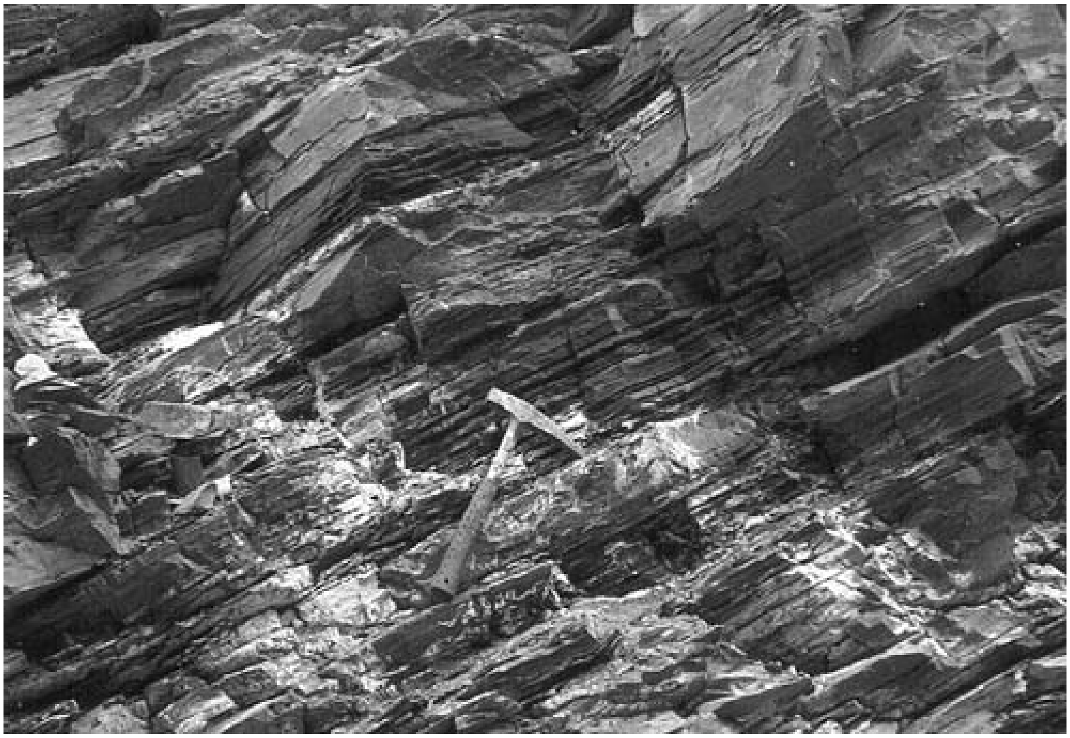

Photo 19. Interlayered, orange-weathering, planar laminated siltstone, argillite and minor quartz sandstone found along Chee Mountain and tentatively assigned to unit Ꞓs.

Photo 20. Large mass of dark grey to brownish weathering limestone within siliciclastics of unit Ꞓs (assigned to subunit Ꞓsla) exposed east of Split Top Mountain. These limestone lenses typically contain abundant archaeocyathid remains (*see* Photo 21) suggesting they may have been isolated biohermal build-ups. A more regional examination of these bodies indicates they are probably olistostromic in origin (H. Gabrielse, personal communication, 1998).

Photo 21. Cross-sectional view of archaeocyathid within unit Ꞓsla approximately 5 kilometres south of Netson Lake.

crosslaminations and load casts. Slate locally becomes cherty and may be interlayered with calcareous slate or phyllite.

Although limestone deposits form a minor part of this map unit, they are important in that they imply relationships with Cambrian carbonate sequences found elsewhere in the map area. These carbonate facies may be distal equivalents of the thick Middle and Upper Cambrian carbonates found in other thrust panels. This is supported by the local presence of carbonate debris-flows which may be derived from nearby coeval, thick carbonate buildups.

In the southern part of the map area, the lower half of the succession locally contains discontinuous layers or lenses of brown-grey to pale orange weathering, grey fossiliferous limestone (Ꞓsla; Photo 20). They range from 10 centimetres to over 20 metres in thickness, can be tens of metres in length and have a rough or rubbly texture in outcrop. These limestone horizons contain abundant archaeocyathid remains (Photo 21) which, together with their lensoidal shape, suggest biohermal buildups. H. Gabrielse (personal communication; 1998) commented that these limestone horizons are well exposed along the highlands south of the Gataga River where relationships suggest they may be, in part or entirely, olistostromic in origin. Two types of limestone are seen in the upper half of the succession: a grey-weathering limestone breccia or conglomerate 1 to 5 metres thick (Photo 22), and a grey, buff to brown or tan-weathering interlayered limestone, sandy limestone to calcareous sandstone and quartzite sequence 1 to 50 metres thick (Ꞓslb; *see* also Photo 39). No archaeocyathids were observed in either of these higher limestones. The amount of carbonate in the upper part of Ꞓs decreases to the northwest, which mimics the northwestward disappearance of the Middle to Upper Cambrian carbonates in other panels.

Photo 22. Polymict clast-supported limestone conglomerate or breccia within unit Ꞓs several kilometres north of Bluff Creek. This unit is approximately 4 metres thick and clasts consist of grey to light grey massive limestone, dark grey, bedded limestone (locally oolitic), orange-weathering limestone and sandy limestone. The matrix is sandy and the unit grades into surrounding sediments of Ꞓs. Several horizons of limestone conglomerate were encountered within siliciclastics of Ꞓs on either side of Bluff Creek. Some have flute casts at their base. The significance of these high-energy deposits within the more basinal lithologies of Ꞓs is not known.

The limestone breccia is composed of subrounded and rounded clasts of oolitic and massive limestone, up to 5 centimetres in diameter, and lesser shale clasts in a sandy limestone matrix. Limestone breccia beds grade upward into laminar limestone overlain by calcareous sandstone and quartzite which rarely contain flute casts and scour marks when succeeded by another breccia horizon. These features suggests a debris-flow origin for these deposits.

The limestone and sandy limestone sequences are moderately to thickly bedded with the latter exhibiting cross-stratification. Pure to sandy limestone (up to 30 per cent quartz grains) may contain thin interlayers of quartz sandstone or quartzite, giving the rock a distinctive ribbed appearance. Carbonate breccia horizons and grey to green slate layers are present locally. Up section, these lithologies are immediately succeeded by up to 150 metres of dark grey slate and minor siltstone, and then lithologies of the Kechika Group.

Age and Correlation

Archaeocyathid-bearing limestone bioherms or olistostromes are present within the lower and middle parts of the this unit along the hangingwall of the Netson Creek thrust fault, indicating an Early Cambrian minimum lower age range. There are no fossil localities in the upper part of this section. In the south, dark slates of unit Ꞓs appear to pass into overlying slates and calcareous slates of the Kechika Group, suggesting a conformable contact and a Late Cambrian upper age range. Although the lack of Middle and Late Cambrian carbonate below the Kechika Group within panels of unit Ꞓs may be the result of an unconformity, its omission is believed to be entirely related to facies transition (*see* section on unit Ꞓc).

Carbonate debris-flows and interlayered carbonate and siliciclastics (Ꞓslb) suggest possible links to Middle and Upper Cambrian carbonate of unit Ꞓc and coarser siliciclastics and carbonate of Ꞓcs or Ꞓcg in adjacent thrust panels. The interlayered carbonate and siliciclastics of Ꞓslb may represent more basinal equivalents of units Ꞓc or Ꞓsc. Archaeocyathid-bearing limestone of possible olistostromic origin (Ꞓsla) suggests shedding of carbonate material from nearby reefal buildups. Turbidic carbonate deposits in unit Ꞓs are also believed to have originated from adjacent carbonate buildups in units Ꞓsc or Ꞓc. This is indirectly supported by the presence of intraformational breccia horizons within Ꞓc along the northern end of the section, southeast of Netson Lake, which could have sourced some of these deposits (*see* Photo 33). In addition, carbonate of Ꞓc interfingers with, and contains, siliciclastic successions similar in composition to those within unit Ꞓs. Some of the turbiditic deposits in Ꞓs contain numerous oolitic carbonate clasts. These were probably derived from Early Cambrian carbonate of unit Ꞓsc and its equivalents, as no oolitic limestone was observed in carbonate sections of Ꞓc. Some carbonate conglomerate deposits within Ꞓs are similar to conglomerate assigned to the Middle Cambrian Ꞓcgm unit (compare Photo 22 with photos 29 and 30) suggesting unit Ꞓs may range as young as Middle Cambrian.

Along the east-central part of the Kechika Trough and extending to the west, Fritz (1979, 1991) describes several facies belts within Cambrian strata. There, several hundred metres of Middle and Late Cambrian black slate are shown to be starved basin equivalents of reefal(?) carbonates of similar age. This suggests that the sequence of black slate at the top of unit Ꞓs, and below Kechika sediments, is time equivalent to nearby carbonate of Ꞓc and that siliciclastic and carbonate of unit Ꞓslb has greater affinities with unit Ꞓsc (Figure 15).

These arguments suggest that the bulk of unit Ꞓs is time equivalent to unit Ꞓsc. It has a higher carbonate component and coarser siliciclastics than Ꞓs, but lithologic similarity of common rock types suggests a link between the two units. This infers a less basinal setting for Ꞓsc which is supported by the overlying carbonates of unit Ꞓc.

In the southern Kechika Trough, Cambrian clastics and carbonates have greater affinities with units Ꞓsc and Ꞓc, suggesting a more shelf-like setting (*see* McClay *et al*., 1988; MacIntyre, 1992, 1998; Fritz, 1980a). The basal archaeocyathid-bearing limestone and succeeding shale, siltstone and sandstone of Ꞓs has similarities to the time-equivalent Gull Lake Formation of the central Selwyn Basin (Gordey and Anderson, 1993). H. Gabrielse (personal communication, 1998), in his recent re-compilation of the Kechika River sheet, has also equated similar Cambrian siliciclastics seen elsewhere in the area with the Gull Lake Formation. The upper age range of the Gull Lake Formation is not known, due to a sub-Rabbitkettle (Kechika Group equivalent) unconformity and lack of fossil control, although a Middle to Late Cambrian range cannot be ruled out (Gordey and Anderson, 1993; Fritz, 1991). Most of the Gull Lake Formation is believed to be an off-shelf equivalent to carbonates and clastics of the Sekwi Formation along the Mackenzie Platform. Early Cambrian carbonate buildups are developed within the study area (unit Ꞓsc) and regionally (Gabrielse, 1962a, b; Abbott, 1981; Kechika and Rabbit River sheets) and may be the source of Early Cambrian olistostromic(?) deposits at the base of Ꞓs. Gabrielse and Blusson (1969), working in the Coal River sheet, describe slate, siltstone, sandstone and conglomerate of Early Cambrian age along the western part of the area which is equivalent to thick sections of pure orthoquartzite to the east (their unit 4). These western facies may be equivalent to rocks of unit Ꞓs. Farther north, basinal rocks of possible Middle and Upper Cambrian age are represented by shales of Hess River Formation (Cecile, 1982; Fritz, 1991).

North of Horneline Creek, rocks of unit Ꞓs are mapped as sitting stratigraphically above rocks of the Hyland Group which is dominated by lithologies compatible with the Yusezyu Formation. The lack of identifiable sections of Narchilla Formation suggests that it may be represented or replaced by lithologies of unit Ꞓs. The Narchilla Formation has been shown to be laterally equivalent to the Vampire Formation (Fritz, 1991; Gordey and Anderson, 1993). The Vampire Formation consists of dark grey siltstone and shale with interbeds of fine-grained quartz sandstone to quartzite and is similar to sections of unit Ꞓs north of Horneline Creek.

QUARTZITE (Ꞓq)

Thick sections of Cambrian quartzite form several mappable packages in the southern part of the map area. In the southeast, poorly exposed sections of quartzite and lesser carbonate are exposed in thrust panels below the Netson Creek fault. In the far southeastern corner of the map area, thick to massively bedded, brown-weathering, brown to beige quartzite and quartz sandstone are exposed in sections up to 15 metres thick below the Middle Cambrian carbonate sequence (Photo 23). These quartzites and sandstones are sometimes calcareous and commonly show cross-stratification and bioturbation (*Cruziana)*.

A well exposed, but strongly folded and faulted sequence of predominantly quartzite is exposed on the east face of Brownie Mountain. Here the section comprises thick to massively bedded grey and brown, impure quartzite, quartz sandstone and white quartzite with lesser grey siltstone and sandy siltstone. The thickness of this section is difficult to determine as it is in the core of an overturned fold which is cut by a thrust fault. A rough estimate is in the order of 200 metres. Sections of quartzite to impure quartzite, from 10 to 30 metres thick, are separated by 10 to 20-metre sections of thin to thick-bedded quartz sandstone and siltstone. The massive to thick-bedded quartzite units show cross-stratification and rare bioturbation in the form of bedding-perpendicular *Skolithus* burrows. The thinner bedded sandstone and siltstone sections commonly contain current ripples and bedding-parallel worm burrows. Less common but conspicuous orange-weathering, cross-stratified limestone to sandy limestone, which locally contains thin interbeds of calcareous sandstone, is found in sections up to several metres thick.

Age and Correlation

These quartzite sections were originally equated with the Gog Group due to similar overall lithologies, associated trace fossils and position below carbonate of inferred Middle to Late Cambrian age (Ferri *et al*. 1995a, b). Although this is reasonable, rapid facies changes within Cambrian strata preclude distinguishing these rocks from other Cambrian units elsewhere in the map area and suggest this terminology is not appropriate. Although we still believe that they are Early Cambrian in age, it is possible that they may, in part or entirely, be related to overlying conglomerate of

Photo 23. Looking north at the eastern flank of Brownie Mountain. This picture shows quartzite of Ꞓq carried at the base of the Brownie Mountain thrust as it overrides a folded sequence of carbonate of unit Ꞓc. The upper slopes of Brownie Mountain are composed of coarse, massive conglomerate of unit Ꞓcg.

unit Ꞓcg, suggesting they are as young as Middle Cambrian.

Thick sections of quartzite have been described from the southern Kechika Trough by MacIntyre (1992, 1998), McClay *et al*. (1988) and Fritz (1979; 1980a) and are broadly Early to Middle Cambrian in age. Unit Ꞓq may also conceivably correlate with the upper parts of Lower Cambrian quartzite in the Coal River map area (unit 4, Gabrielse and Blusson, 1969) which, in turn, may be correlative with the upper part of the Upper Proterozoic to Lower Cambrian Backbone Ranges Formation further northeast (Gabrielse *et al*., 1973).

SILICICLASTICS AND CARBONATES (Ꞓsc)

A mixed succession of sandstone and quartzite (partly limy), limestone and dolostone, and lesser slate and siltstone (Photo 24) is exposed along the hangingwall of the Gataga Mountain thrust fault, between Gataga and Terminus mountains. Similar rocks are found in the hangingwall of thrust faults southwest of Gataga Mountain. Structural sections suggest thicknesses ranging from 400 to 700 metres. The coarser siliciclastics are generally well bedded on a scale of centimetres to decimetres, and some beds show grading, well developed ‘herringbone’ crossbedding (Photo 25) and, rarely, ripple marks and trace fossils such as worm trails and burrows. Quartzites and quartz sandstones are pale grey to pink or beige, and are more thickly bedded to massive. They are locally calcareous, especially close to limestone. Intervals of platy limestone to limy sandstone are common, forming beds or a series of beds within the siliciclastics. Slate and siltstone are generally subordinate, comprising thin interbeds in the other rocks.

Northwest of Gataga Mountain, the contact between the Gataga Volcanics and unit Ꞓsc is believed to be unconformable and the entire sequence is overturned. Lithologies in Ꞓsc become more argillaceous to the northwest and contain thick sections of grey to grey-brown slate, siltstone and fine-grained, grey sandstone. Horizontal worm burrows are sometimes observed within the slate and siltstone sections.

Limestone and Dolostone (Ꞓl)

Near the top of unit Ꞓsc are thick limestones and lesser dolostones which are well exposed north and south of Matulka Creek, particularly at the summit of Terminus Mountain. This unit forms sections up to 200 metres thick and is traceable for up to 4 kilometres. The limestone is generally pale to medium grey and buff-grey, very fine to medium grained and more homogeneous and massive than limestone lower in the stratigraphy where limestone is interbedded with the siliciclastics; however, it is not as uniform as the thick Middle to Upper Cambrian carbonates of unit Ꞓc. Bedding is generally indistinct, although locally, where the limestone is sandy and oolitic, or has argillaceous

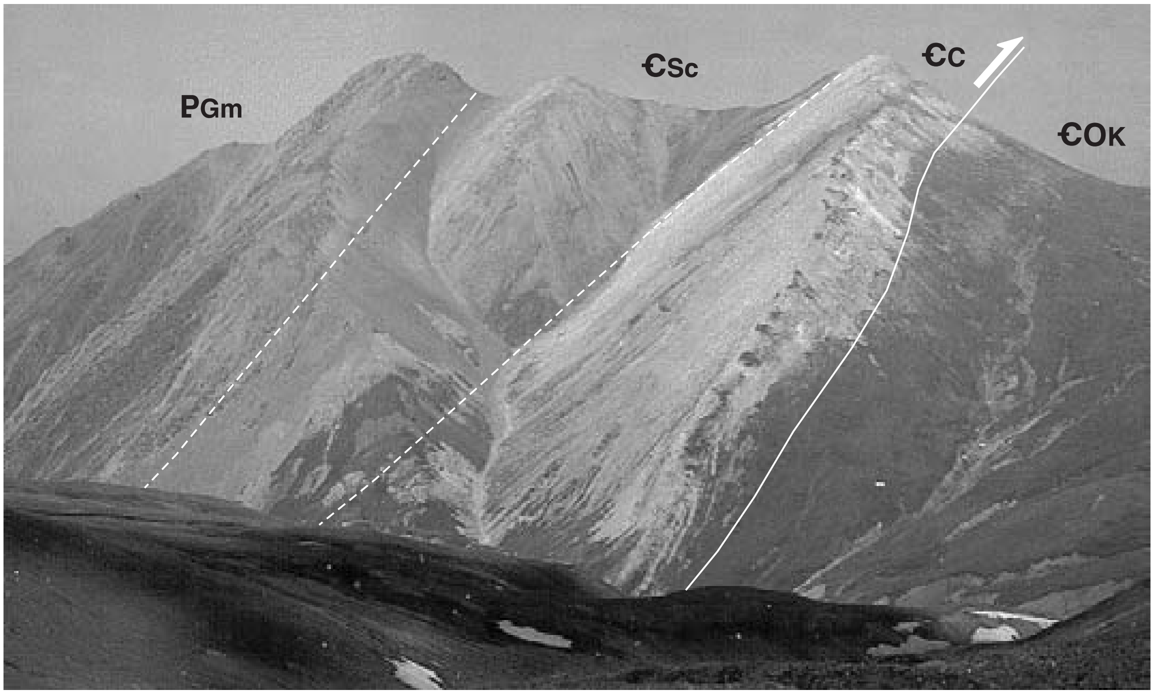

Photo 24. View to the northwest from near Gataga Mountain looking at the eastern overturned limb of the Gataga Mountain anticline. The Gataga Volcanics (PGm) are unconformably overlain by siliciclastics and minor carbonates of unit Ꞓsc which are in turn conformably overlain by carbonate of Ꞓc. A very thin quartzite-pebble conglomerate assigned to unit Ꞓcg is found between Ꞓsc and Ꞓc.

Photo 25. Herringbone cross-stratification in quartzites of unit Ꞓsc, northwest of Gataga Mountain.

laminae, bedding is more clearly defined. Dolostone to sandy dolostone is fairly common and weathers pale orange-brown. A few beds of limestone-rich, dark grey to black oncolites up to 4 centimetres across were noted.

Age and Correlation of Units Ꞓsc *and* Ꞓl

North and south of Matulka Creek, archaeocyathids were found in limestone of unit Ꞓl. Archaeocyathids were also seen in carbonate horizons below limestone of Ꞓl, immediately above rocks of unit ꞒPs. The age of these latter sediments is uncertain, but they are believed to be Cambrian and most likely equivalent to unit Ꞓs.

South of Matulka Creek, Middle Cambrian maroon clastics and carbonates of unit Ꞓcg typically sit above those of unit Ꞓsc. This is not the case on the east side of the Gataga Mountain anticline where rocks of Ꞓcg appear to thin to the northwest and terminate within lithologies of unit Ꞓsc, which, in turn, crop out below Middle and Upper Cambrian carbonates of Ꞓc. The implication of this is that, along the east side of the anticline, the section of Ꞓsc that is above Ꞓcg, and extends southeastward along the top of the Upper Gataga and Gataga volcanics, is entirely of Middle Cambrian age. Lithologically these rocks appear similar to the bulk of unit Ꞓsc and have been grouped with it. On the east side of the Gataga Mountain anticline, only a few metres of Ꞓcg immediately underlie carbonates of Ꞓc and the entire upper section of Ꞓsc has either been removed or not deposited. In summary, unit Ꞓsc ranges from Early to Middle Cambrian in age.

Unit Ꞓsc was originally part of units 4 and 5c of Gabrielse (1962a). It is time equivalent to parts of unit Ꞓs. Furthermore, finer grained sections of Ꞓsc are very similar to lithologies within Ꞓs, suggesting a facies relationship between the two units within the map area (Figure 15). In the southern Kechika Trough, the Early Cambrian is represented by quartzite, siltstone, shale and carbonate assigned to the Gog Group (Fritz, 1991; MacIntyre, 1992, 1998; McClay *et al*., 1988), very similar to the lower part of unit Ꞓsc. Middle Cambrian clastics in the southern Kechika Trough are believed to be related to syn-depositional block faulting and, as a consequence, exhibit extreme facies changes (Fritz, 1991; 1979). Parts of the described sections are broadly similar to the upper parts of Ꞓsc. The suggested block faulting in the south may be present within the study area and may explain for the apparent thickness variations of unit Ꞓsc across the Gataga anticline.

In the Coal River map area, several hundred metres of limestone, siltstone, sandstone and sandy dolomite to dolomitic sandstone are of Early Cambrian age (units 5 and 6; Gabrielse and Blusson,1969). These rocks are broadly similar in age and overall composition to rocks of unit Ꞓsc. Possible equivalents of Ꞓsc further north in the Selwyn Basin include the Early Cambrian Sekwi Formation. The Sekwi Formation is dominated by carbonate rocks, although in northeast-central Selwyn Basin it shows considerable variation and contains thick tongues of coarse to fine clastics (Fritz, 1991).

CONGLOMERATE AND MAROON FACIES (Ꞓcg)

Up to 250 metres of distinctive massive, polymictic granule to boulder conglomerate is exposed in the core of the overturned Brownie Mountain anticline. These rocks plunge northwestward below Middle to Late Cambrian carbonate of unit Ꞓc, re-appear along the banks of a southwestward flowing creek, and then disappear northward below rocks of the Kechika Group. Similar, but much thinner and finer conglomerate is exposed in the hangingwall of the Gataga Mountain thrust, just west of Brownie Mountain. Quartzite, sandstone, dolomite and conglomerate southeast of Brownie Mountain are also provisionally assigned to this unit. One to several hundred metres of distinctive maroon, mixed siliciclastic and carbonate, together with an unusual limestone pebble to cobble conglomerate crops out along the base of unit Ꞓc or within unit Ꞓsc north of Gataga Mountain. Although these rocks were originally grouped with either Ꞓc or Ꞓsc, it is now believed they are equivalent to conglomerate on Brownie Mountain and therefore have been separated out (see following section on Ꞓcgm).

Conglomerate exposed on Brownie Mountain is massive, brown weathering and brown to grey or green on fresh surfaces (Photos 26, 27). The lower contact of this unit was not observed at Brownie Mountain, but its top appears to grade upward into limestones and dolomites of unit Ꞓc. The conglomerate is polymictic and matrix supported with 30 to 70 per cent subangular to rounded granule to boulder-sized clasts. Clast types include brown to white quartzite (70 per cent), orange, grey or maroon-weathering limestone (10 per cent), dark grey, grey or green slate and siltstone (10 per cent) and green basalt(?), diorite or gabbro (10 per cent; Photo 27). Much of the matrix is green and chloritic, and it is speculated that much of it is tuffaceous, implying that the conglomerate was derived from the erosion of volcanic as well as sedimentary rocks. Grey to brown slate, siltstone and sandstone units up to several metres thick are locally present.

Southeast of Brownie Mountain, interlayered 1 to 2-metre beds of orange, buff to white, planar to cross-stratified quartzite, quartz sandstone and dolomite to sandy dolomite are tentatively assigned to this unit. The upper part of this package contains distinctive layers of quartzite-pebble conglomerate 10 to 20 centimetres thick, with clasts from 3 to 10 centimetres in diameter. Locally, sandy dolomite near the top of these conglomerates contains isolated quartzite cobbles up to 5 centimetres in diameter. The assignment of this package to unit Ꞓcg is based primarily on the presence of conglomerate together with the coarseness and colour of associated siliciclastics.

Maroon Facies (Ꞓcgm)

Between Gataga and Terminus mountains a package of siliciclastics and carbonates, unit Ꞓcgm, is commonly a distinctive maroon colour. This section is also characterized by the presence of one or more horizons of polymictic conglomerate. These rocks were previously noted by Ferri *et al*. (1996a, b) but were grouped with either unit Ꞓc or Ꞓsc. Discussions with H. Gabrielse (personal communication,

Photo 26. Massive boulder conglomerate of unit Ꞓcg, found along the ridge containing Brownie Mountain.

Photo 27. Close up of Ꞓcg conglomerate showing its polymictic character, including the presence of mafic igneous clasts of probable volcanic origin. This, together with the green, chloritic matrix, suggests coeval volcanic activity.

1997) on the regional significance of these lithologies has led us to agree that this package is equatable with conglomerate along Brownie Mountain. This is supported by the similarities between certain lithologies and the same stratigraphic position of the two sequences.

These rocks are exposed on both limbs of the Gataga Mountain anticline south of Matulka Creek. Along the south end of the eastern, overturned limb, the unit is only a few metres thick but thickness increases northward to over 100 metres just south of Matulka Creek. The distinctive maroon colour is easily seen along the top of the ridge, where it is at the base of carbonates of unit Ꞓc, and extending northwestward from the northern termination of the Gataga Volcanics to Matulka Creek (Photo 28). Maroon clastics and carbonates also form a section up to 100 metres thick above carbonate of unit Ꞓl along the northern limb of the Gataga Mountain anticline. The thickest and best exposed section of this unit is on the eastern limb of the anticline along the top of the ridge immediately south of Matulka Creek. Its true thickness is difficult to determine due to folding and faulting, but it is at least 100 metres. Stratigraphically, these rocks are found between units Ꞓsc and Ꞓc.

The section is characterized by distinctive maroon to pinkish silty limestone to micaceous siltstone up to 15 metres thick, interlayered with equally thick, thin to thickly bedded, grey to light grey to maroon, finely crystalline limestone which locally contains up to 30 per cent subangular grey to maroon chert fragments and quartz grains. It also includes planar to crossbedded, grey to brown, calcareous quartz sandstone to quartzite, with horizons of sandy limestone and micaceous siltstone, also locally maroon in colour. One of the most characteristic lithologies in this section is grey to maroon, massive polymictic conglomerate up to 20 metres thick (Photo 29a, b). Clasts are dominated by grey to white limestone (80 per cent), maroon siltstone and maroon calcareous siltstone to limestone (15 to 20 per cent) and minor black to grey chert (less than 2 per cent). Clasts are well rounded and stretched along the foliation, with the dimensions of the larger clasts being as much as 20 centimetres long by 5 centimetres in diameter. Several conglomerate units were observed and the thickest contain maroon siltstone, sandy limestone and calcareous sandstone layers. Conglomerate is also associated with white to light grey, very finely crystalline limestone with thin to thick layers of maroon siltstone to calcareous siltstone.

This section thins southeastward along the top of the ridge. It is only some 8 metres thick, stratigraphically below unit Ꞓc where it terminates against the Gataga Mountain thrust fault. This unit is found on the northeast-facing slope, just north of the small syncline containing limestone assigned to unit ꞒPl. At this locality, light green matrix-supported conglomerate, up to 4 metres thick, rests stratigraphically below limestone of unit Ꞓc. The colour is imparted by the green, sericitic matrix. Clasts are pebble sized, well rounded and composed of white to beige quartzite (80 per cent) and limestone (20 per cent). Below the conglomerate is equally thick, maroon, sandy limestone with maroon siltstone to slate partings. The limestone contains angular to rounded, cherty red siltstone clasts less than 1 centimetre across. It is followed down section by similar conglomerate and limestone. A green to greyish micaceous sandstone with shale and siltstone partings is exposed below the lower limestone. This gives way to grey to grey-brown siltstone, slate and very fine sandstone typical of unit Ꞓs. Outcrop is lost up slope and the next series of exposures is similar slates, siltstones and sandstones which are part of unit ꞒPs. A possible Proterozoic age is assigned to the latter sediments due to stratigraphic links with the Upper Gataga Volcanics.

To the southeast, rocks of units Ꞓsc and Ꞓc re-appear in the hangingwall of the Gataga Mountain thrust. Similar greenish conglomerate, 1 to 3 metres thick, with a sericitic matrix is again exposed between rocks of units Ꞓsc and Ꞓc. Quartzite clasts are up to 30 centimetres across and some are composed of the enclosing slates and siltstones of unit Ꞓsc. The conglomerate also appears to form lenses within siliciclastics of Ꞓsc.

Maroon clastics and carbonates on the southwestern limb of the Gataga Mountain anticline are very similar those

Photo 28. Looking northwest toward Terminus Mountain (in the far distance) along the ridge containing Gataga Mountain. The observer is approximately 8 kilometres northwest of Gataga Mountain. The ridge contains several hundred metres of steep to northeasterly overturned maroon sediments of unit Ꞓcgm exposed along the northeastern limb of the Gataga Mountain Anticline. These can be traced as far north as Terminus Mountain and thin to several metres a few kilometres north of Gataga Mountain.

(a)

(b)

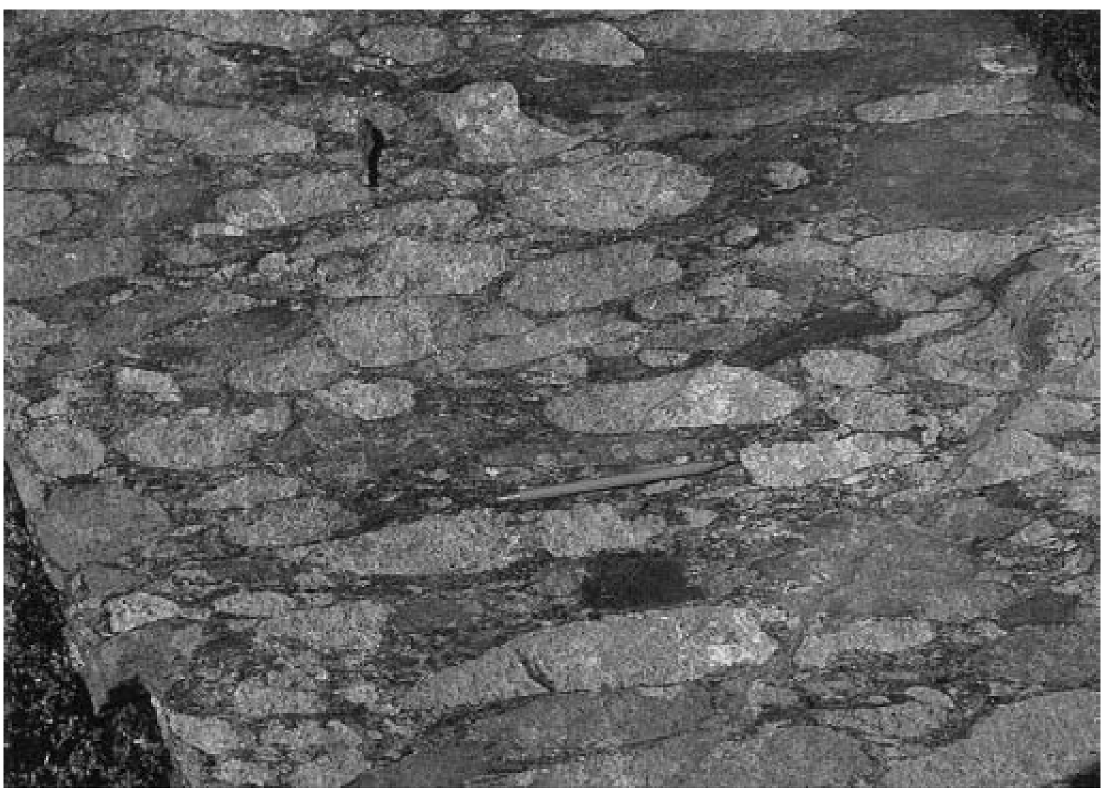

Photo 29. Maroon-coloured, polymict carbonate conglomerate of unit Ccgm, several kilometres southeast of Terminus Mountain. The clasts at this locality are elongate due to plastic deformation. (a) View looking down the long axis of the lineation and (b) perpendicular to the long axis of lineation.

along the northeastern limb. They occur above archaeocyathid limestone assigned to unit Ꞓl. The conglomerate contains well rounded, pebble to cobble-sized clasts of grey or cream-coloured limestone or sandy limestone up to 15 centimetres across, as well as a few pebbles of maroon siltstone or grey-black chert. It is up to 10 metres thick, well sorted and clast supported, with a brownish maroon, sandy carbonate matrix. These rocks pinch out northwestward and disappear into clastics and carbonates of Ꞓsc. These maroon rocks, together with the underlying limestone of Ꞓl, were originally correlated with maroon siltstone, slate and limestone of ꞒPsm and ꞒPl into which they can be traced, and which occur stratigraphically below the Upper Gataga Volcanics (Ferri *et al*., 1996a, b). However subsequent dating of the Gataga Volcanics suggests the Upper Gataga Volcanics may also be Proterozoic in age indicating this interpretation may be invalid and a thrust fault is inferred separating the two sequences until further dating can resolve the problem.

Northeast of Graveyard Lake, a broad, poorly exposed region, is underlain by sandstone, siltstone, conglomerate and slate, believed to be Cambrian in age and tentatively assigned to unit Ꞓs, although other units of Cambrian age or younger may also be represented. These rocks are characterized by massive to thickly bedded, white or grey to maroon or brown calcareous sandstone or wacke to conglomerate, locally approaching 10 metres in thickness. Sand grains are dominated by spherical, vitreous quartz with lesser dark grey chert, argillite, carbonate and rare feldspar. Conglomerate clasts are typically granule to pebble sized, although locally they approach 30 centimetres in diameter (Photo 30). This conglomerate, together with the maroon colour of some of the sandstones, led us to correlate these facies with Ꞓcg. Clast composition is diverse, with varicoloured quartzite (white, red to maroon, grey to dark grey), grey limestone (some of which is oolitic), orange-weathering limestone, white to black chert, sandy limestone, grey siltstone and greenish grey sandstone. Quartzite clasts tend to be rounded but many range to subangular. Clasts are supported by a calcareous quartz sandstone matrix which approaches a sandy limestone in places. These coarser clastics are associated with cream to buff-weathering, blue-grey limestone, red-banded cherty siltstone, olive green chert and cherty argillite and grey slate. Also in this area, thinly interlayered pale to medium grey, laminated and crosslaminated, fine calcareous siltstone to silty limestone and medium to dark grey silty slate may occur near outcrops of the sandstone and conglomerate. These rocks superficially resemble the Kechika Group. Outcrops of orange-weathering, dolomitic siltstone, possibly belonging to

Photo 30. Polymict conglomerate (with clasts of quartzite, chert and carbonate) north of the Graveyard Lake valley and tentatively assigned to unit Ꞓcgm.

the Road River Group, were also noted. These occurrences may represent outliers of younger units, or they may be lithological variations of Middle Cambrian sequences. The latter explanation is favoured considering the complex facies variations seen within rocks of Cambrian age in the southeastern Kechika Trough (Taylor *et al*., 1979; Fritz, 1979).

West of the Kechika River, along the eastern slope of the ridge east of Aeroplane Lake, rocks tentatively assigned to the Middle Cambrian comprise interlayered dark grey to bluish grey argillite, cherty argillite, slate to phyllite and pale grey, laminated micaceous quartz sandstone. These rocks contain thick sections of massive to thickly bedded grey calcareous quartz sandstone with distinctive rip-ups of dark grey argillite. Other clasts consist of well rounded, vitreous quartz, chert, siltstone and limestone or calcite. Although this panel has similarities to Earn Group clastics, the calcareous quartz sandstone is atypical and its heterolithic character is not unlike clastics of Middle Cambrian age.

Age and Correlation of units Ꞓcg *and* Ꞓcgm

No fossils were recovered from rocks of the conglomerate and maroon facies. Its age is inferred from its relative stratigraphic position and correlation with similar units of known age elsewhere within the Kechika Trough. It occurs stratigraphically above archaeocyathid-bearing limestone of unit Ꞓl and below carbonate of Ꞓc, which is believed to be Middle to Late Cambrian in age. One of its distinguishing features is the conglomeratic facies, which, from its coarseness and abundance of incompetent clasts such as limestone and siltstone, suggests erosion of local lithologies due to rapid uplift. Similar rocks (interpreted as a fanglomerate), with associated red beds, occur in the same stratigraphic position in the Tuchodi and Ware map areas. It is one of numerous Cambrian facies found in the southern Kechika Trough and adjacent shelf (Taylor *et al*., 1979; Taylor and Stott, 1973; Fritz, 1979; 1991) and is referred to as the 'Roosevelt facies' due to its excellent exposure near Mount Roosevelt (Fritz, 1991). Sections of similar conglomerate and red or maroon beds are described near Mt. Sylvia in the Ware (94F) map area (Fritz, 1979). The conglomerate and associated red beds are more than 1525 metres thick at Mount Roosevelt. In both areas, the base of the conglomeratic facies is believed to occur just above the Lower-Middle Cambrian boundary (Fritz, *ibid.*).

CARBONATE (Ꞓc)

Most of the spectacular peaks in the Gataga River area are underlain by steeply dipping panels of thick-bedded limestone and dolostone (Photos 2 and 31). It is the disappearance of these carbonates at Terminus Mountain that marks the northern end of the Rocky Mountains. Excellent carbonate exposures are found along the ridge northeast of the Gataga River in the southeast part of the study area. This carbonate panel can be traced to the northwest where it thins and finally disappears into shales and siltstones southeast of Netson Lake. Split Top Mountain represents the next westerly belt of this carbonate package. Several ridges of carbonate that trend northwest from this area delineate splays off the main thrust at the base of Split Top Mountain (Photo 32). These carbonate sections also thin northwestward and the last carbonate associated with this fault zone shales out a few kilometres north of Brownie Mountain. These rocks are well exposed north and south along the ridge containing Brownie Mountain and there are spectacular exposures to the east along the hangingwall of the Gataga Mountain thrust fault. This same panel can be traced northward, along the west side of the Gataga Mountain anticline and onto the west slopes of Terminus Mountain. Unit Ꞓc is also found on the overturned east limb of this anticline. This carbonate is also present within impressive klippe sitting above Road River siltstones several kilometres southeast of Terminus Mountain.

Thicknesses and lithologic characteristics of these rocks change dramatically across the map sheet. Approximately 1500 metres of carbonate are inferred from structural sections through the rugged ridge west of Brownie Mountain, whereas only 700 metres of carbonate are exposed on the ridge along the southeastern boundary of the study area. The northward thinning and disappearance of these carbonates is illustrated by this section which thins progressively from an initial 700 metres.

The carbonates are generally massive and fairly 'clean', unlike the Lower Cambrian carbonates described earlier. Although thin beds of sandy limestone to limy sandstone or quartzite occur locally, they are relatively uncommon. The only exception to this are mappable siliciclastic units found within this carbonate succession in the far southeastern part of the map area (unit Ꞓcs). The Lower Cambrian carbonates also tend to be darker weathering than the grey to light grey carbonates of unit Ꞓc. The dominant lithology is massive to thickly bedded, grey to tan weathering, grey to white micritic to finely recrystallized limestone. Thin, discontinuous beds of more resistant, lighter coloured dolostone and dolomitic limestone are locally present. Intraformational carbonate breccia and conglomerate are less common but were mapped within the easternmost limestone body (Photo 33). Fenestral dolostone was also seen toward the base of this limestone panel. Large sections of the sequence have been variably dolomitized, forming massive buff to orange-weathering sections in the Split Top Mountain area, at Brownie Mountain and along the ridge to the west. Limestone or dolostone locally contain up to 30 per cent well rounded quartz grains and local interlayers of thin to thick beds or sections (up to 5 m thick) of white to tan-weathering quartzite give the succession a distinctive ribbed appearance.

Intra-Carbonate Siliciclastics (Ꞓcs)

Siliciclastics and lesser carbonates form lenticular sequences between 30 and 150 metres thick within carbonate sections of unit Ꞓc along the footwall of Netson Creek thrust fault south of Bluff Creek. They consist of thin to moderately bedded, grey and brown to tan-weathering, grey siltstone, slate and quartz sandstone, interlayered with lesser grey to buff-weathering sandy limestone, sandy dolomite, dolomite and dark grey argillaceous limestone. Sandstone is wavy to planar bedded whereas siltstone and slate sections have colour banding or striping and frequently worm burrows on bedding planes.