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GEOLOGICAL STUDIES, VICTORIA LAKE GROUP, CENTRAL NEWFOUNDLAND

D.T.W. Evans, B.F. Kean[1] and G.R. Dunning[2]
Mineral Deposits Section

ABSTRACT

The Victoria Lake Group is a sequence of island-arc volcanic, volcaniclastic and epiclastic rocks. Recent studies show that the group is a composite, structurally complex collection of rocks of varying ages, geochemical groupings and tectonic environments.

Geochemical studies indicate that the Victoria Lake Group is composed of a number of distinct chemical groupings, which appear to record the transition from island-arc to back-arc environments. Massive sulphide mineralization probably formed during the arc-rifting event, as is suggested by its spatial relationship to highly depleted mafic volcanic rocks.

U–Pb zircon dating of the volcanic sequences, within the Victoria Lake Group, have identified three age-groupings of volcanic rocks; 513 ± 2 Ma for the Tally Pond volcanics, 498^{+6}_{-4} *Ma for the Tulks Hill volcanics and* 462^{+4}_{-2} *Ma for the Victoria Mine sequence. Three intrusive bodies were also dated. The Roebucks quartz monzonite, intrusive into the Tulks Hill volcanics, was dated at 495 ± 4 Ma and is probably coeval with the volcanism. Two large plutons, the Valentine Lake and Crippleback Lake quartz monzonites, dated as Late Precambrian, are interpreted to be structurally emplaced along the southern margin of the Victoria Lake Group.*

A complex network of linears dictate the present distribution of the geological elements of the Victoria Lake Group. These linears may be related to a period of major, southeastward-directed thrusting, followed by a period of sinistral transcurrent faulting. Gold mineralization exhibits a spatial relationship to the linears. However, it appears to be restricted to areas of intense deformation characterized by brittle–ductile shearing.

INTRODUCTION

The Victoria Lake Group, as defined by Kean (1977), consists of all pre-Caradocian volcanic and sedimentary rocks that underlie the Dunnage Zone (Williams, 1979), in the area extending from Grand Falls in the northeast to King George IV Lake in the southwest, and from Red Indian Lake in the north to Noel Paul's Brook in the south (Figure 1).

Detailed metallogenic studies of the Victoria Lake Group and adjoining sequences in central Newfoundland were initiated in 1984. This work included mapping areas of new exposure, regional rock-geochemistry, paleontology, geochronology and metallogenic studies. The metallogenic studies involved detailed stratigraphic, structural and geochemical analysis of the volcanogenic massive sulphide and epigenetic gold mineralization. For detailed descriptions of the mineral deposits, the reader is referred to Kean (1985), Kean and Evans (1986, 1988) and Evans and Kean (1986, 1987).

Access to the area is provided by woods-roads from Millertown and Grand Falls. The area is characterized by heavily forested, gently undulating topography covered by extensive glacial till. Consequently, bedrock exposure is poor except for Tulks Ridge, which extends from Tulks Valley to the mouth of Victoria River.

Regional Studies

The objective of this project was to undertake a detailed examination of the metallogeny and tectonic setting of mineralization, within the Victoria Lake Group. The project has resulted in significant revisions to the geology and understanding of the tectonic setting of the Victoria Lake Group. Such revisions have regional implications for the Dunnage Zone. The results of this project, outlined below, form the focus of this paper. They are:

[1] Currently on assignment to the Mineral Resource Management Branch, Department of Mines and Energy.

[2] Department of Earth Sciences, Memorial University of Newfoundland, St. John's, Newfoundland, A1B 3X5.

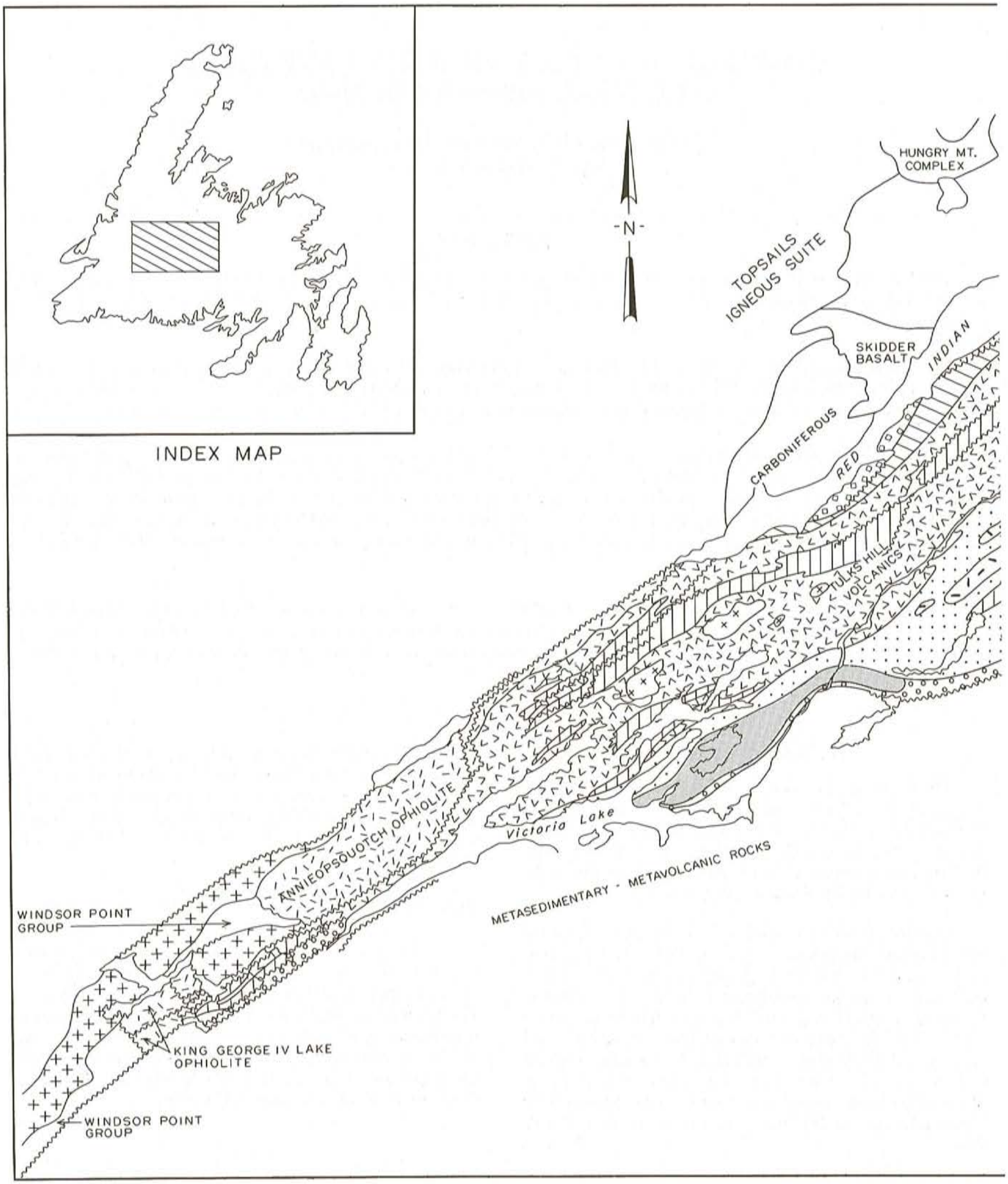

Figure 1. *Geology of the Victoria Lake Group and its adjoining sequences.*

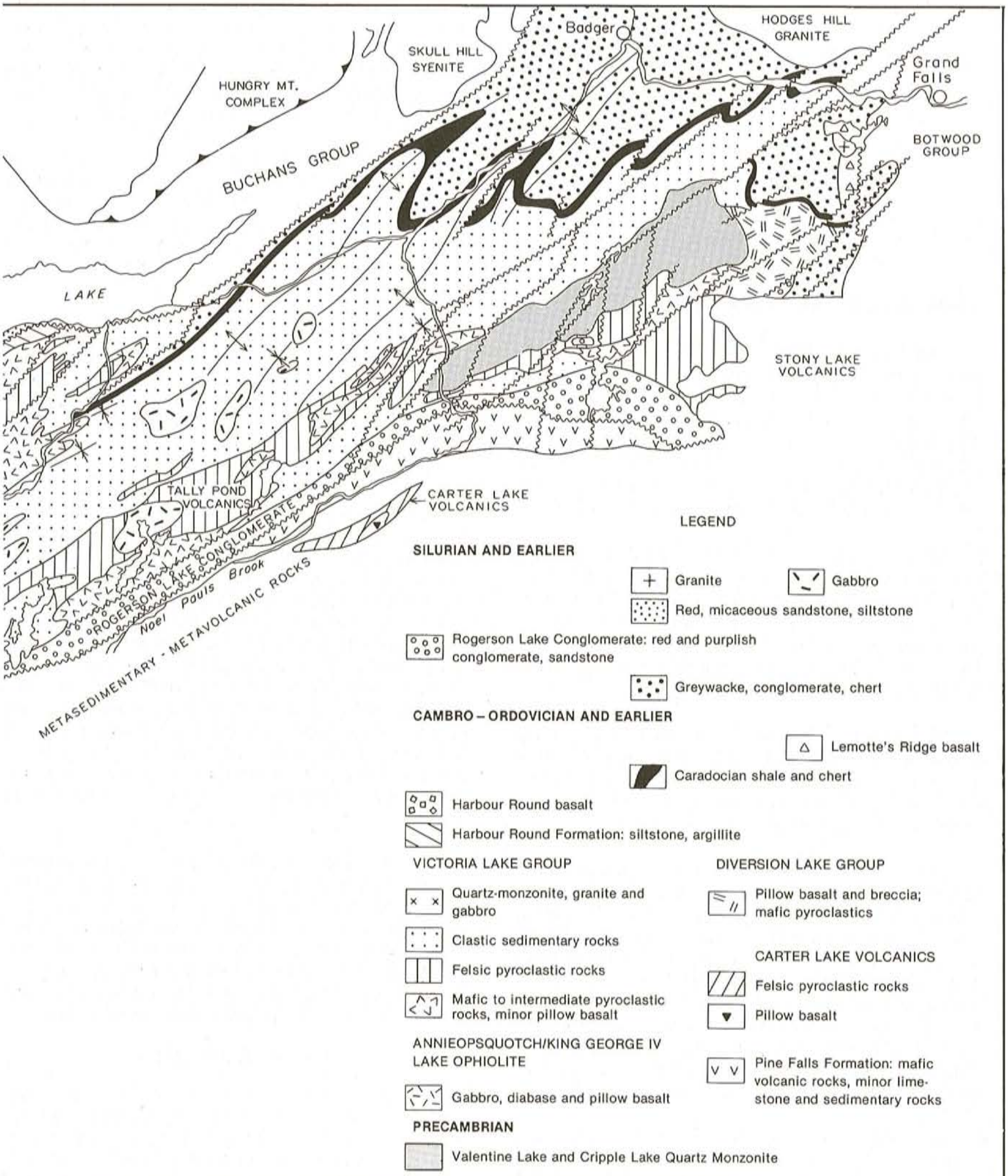

Figure 1. *(Continued).*

(1) recognition of the composite nature of the Victoria Lake Group including:
    a) the distinct geochemical groupings of mafic volcanic rocks, and
    b) at least three ages of volcanic sequences and Precambrian intrusive rocks;

(2) identification of regional linear structures, which explain the distribution of the geological elements of the group, and

(3) documentation of the mineralization and its tectonic setting.

Nature of the Victoria Lake Group

Lithological Subdivisions. Regionally, the group can be subdivided into two major lithofacies (Kean and Jayasinghe, 1980, 1982; Kean, 1985): 1) volcanic rocks comprising two linear belts, the Tulks Hill volcanics to the southwest and the Tally Pond volcanics to the southeast; and 2) a laterally equivalent, volcanically derived sedimentary belt in the northeast (Figure 1). The stratigraphy of the Victoria Lake Group and its adjoining sequences is shown in Table 1.

Both the Tulks Hill and the Tally Pond volcanics are characterized by linear belts of predominantly felsic pyroclastic rocks having intercalated mafic flows, pillow lava, tuff, agglomerate and breccia. Mafic flows are more prevalent in the Tally Pond volcanics. The two belts represent significant time-stratigraphic units of volcanic activity and associated hydrothermal alteration and mineralization.

The two volcanic belts are similar lithologically, however, deformation within the Tulks Hill volcanics is more intense and has largely obliterated primary structures. Geochronological studies have identified at least three ages of volcanism within the Victoria Lake Group.

Siliciclastic rocks constitute much of the sedimentary belt. These rocks, comprising greywacke and interbedded siltstone, shale, argillite, conglomerate and rare limestone, are interpreted to represent a shallowing-upward turbidite sequence. Volcanic detritus is a common constitutent in the sedimentary belt (of the Victoria Lake Group) and both the amount and coarseness of this material increases toward the volcanic belts, suggesting that the clastic sedimentary rocks were derived from the adjacent and underlying volcanic sequences. Small intercalations or lenses of volcanic rock occur throughout the sedimentary sequence.

Limestone lenses near the top of the sedimentary sequence, at the mouth of Victoria River, have yielded late Llanvirn to early Llandeilo conodonts (Kean and Jayasinghe, 1982). Siliceous siltstone and chert are more common near the top of the sequence, where the sedimentary rocks pass conformably upward into Llandeilo–Caradoc chert and shale (Kean and Jayasinghe, 1982; Williams, 1989).

Linear bodies of medium grained quartz monzonite, minor granite, granodiorite, diorite and gabbro that occur within the volcanic belts of the Victoria Lake Group, are interpreted to be comagmatic with the volcanism. However, the larger plutonic bodies (Valentine Lake and Crippleback Lake), located along the southeastern margin of the group, are significantly older than the volcanic rocks.

In the Red Indian Lake area, the Victoria Lake Group is conformably overlain by siltstone and tuffaceous sandstone of the Harbour Round Formation. Elsewhere along its western margin the group is in fault contact, along the Lloyds River–Red Indian Lake fault system, with the King George IV and Annieopsquotch Ophiolite complexes, Southwest Brook complex and the Buchans Group.

Nowlan and Thurlow (1984) suggested that the Buchans Group was thrust southeastward over the Victoria Lake Group and its adjoining sequences including the Harbour Round basalts and the Harbour Round Formation and Victoria Mine sequence of Kean and Evans (1988). It is suggested that the style of thrusting observed within the Buchans Group (Calon and Green, 1987) can be extended to the Victoria Lake Group.

Along its southeastern margin, the Victoria Lake Group is unconformably overlain by the Rogerson Lake Conglomerate. This unconformity is locally sheared and faulted. The linear, narrow outcrop pattern of the conglomerate, and the local clast provenance, suggest it is a fault-scarp, molasse-type deposit. The conglomerate, locally interbedded with red sandstone, appears to fine upward and southeastward into red and grey, micaceous, ripple-marked sandstone. This is the case in the Sandy Lake area, south of Grand Falls, where rocks of deltaic origin, originally assigned to the Rogerson Lake Conglomerate (Kean and Jayasinghe, 1980), should probably be assigned to the Botwood Group. The Rogerson Lake Conglomerate has traditionally been lithologically correlated with the Botwood Group.

The Victoria Lake Group has an inhomogenously developed, regional penetrative foliation defined by chlorite, sericite, flattened clasts and crystal augen. The intensity of this foliation, which is subparallel to bedding and axial planar to tight to isoclinal folds, increases to the southwest. The rocks have been metamorphosed to the lower-greenschist facies, except locally along their southern margin where middle-greenschist to lower-amphibolite facies rocks are present.

GEOCHEMISTRY

The geochemistry of the mafic volcanic rocks, within the Victoria Lake Group and adjoining sequences, indicates that a wide range of chemical groupings and tectonic environments of formation are present (Figure 2). The mafic volcanic rocks can be divided into three broad chemical groupings (Kean and Evans, 1988); 1) island-arc tholeiites represented by the Beatons Pond and Harmsworth Steady basalts of the Tulks Hill volcanics and the Lake Ambrose–Tally Pond basalts and the Sandy Lake sequence of the Tally

Table 1. Simplified stratigraphy and geochronology of the Victoria Lake Group and adjoining sequences

Ma	Period/Epoch		Simplified Stratigraphy of the Victoria Lake Area			
	Silurian					
440	ORDOVICIAN	Ashgillian			Flyschoid Sequences Conformable	Rogerson Lake Conglomerate (?) unconformable upon Tally Pond Volcanics and Valentine Lake Q.M.
450		Caradocian		Harbour Round Formation (?) Conformable	Black Shale and Chert Conformable	
460		Llandeilian		Victoria Mine Sequence 462^{+4}_{-2} Ma (?)	Sedimentary Facies (?)	
470		Llanvirian				
480		Arenigian	Annieopsquotch Complex 478^{+3}_{-2} Ma in fault contact with Tulks Hill Volcanics			
490		Tremadocian	Roebucks Q.M. 495±4 Ma	Tulks Hill volcanics 498^{+6}_{-4} Ma (?)		
500	Cambrian					
510						Tally Pond Volcanics 513±2 Ma
	Precambrian			Valentine Lake Q.M. 563±2 Ma		Crippleback Lake Q.M. 565^{+4}_{-2} Ma

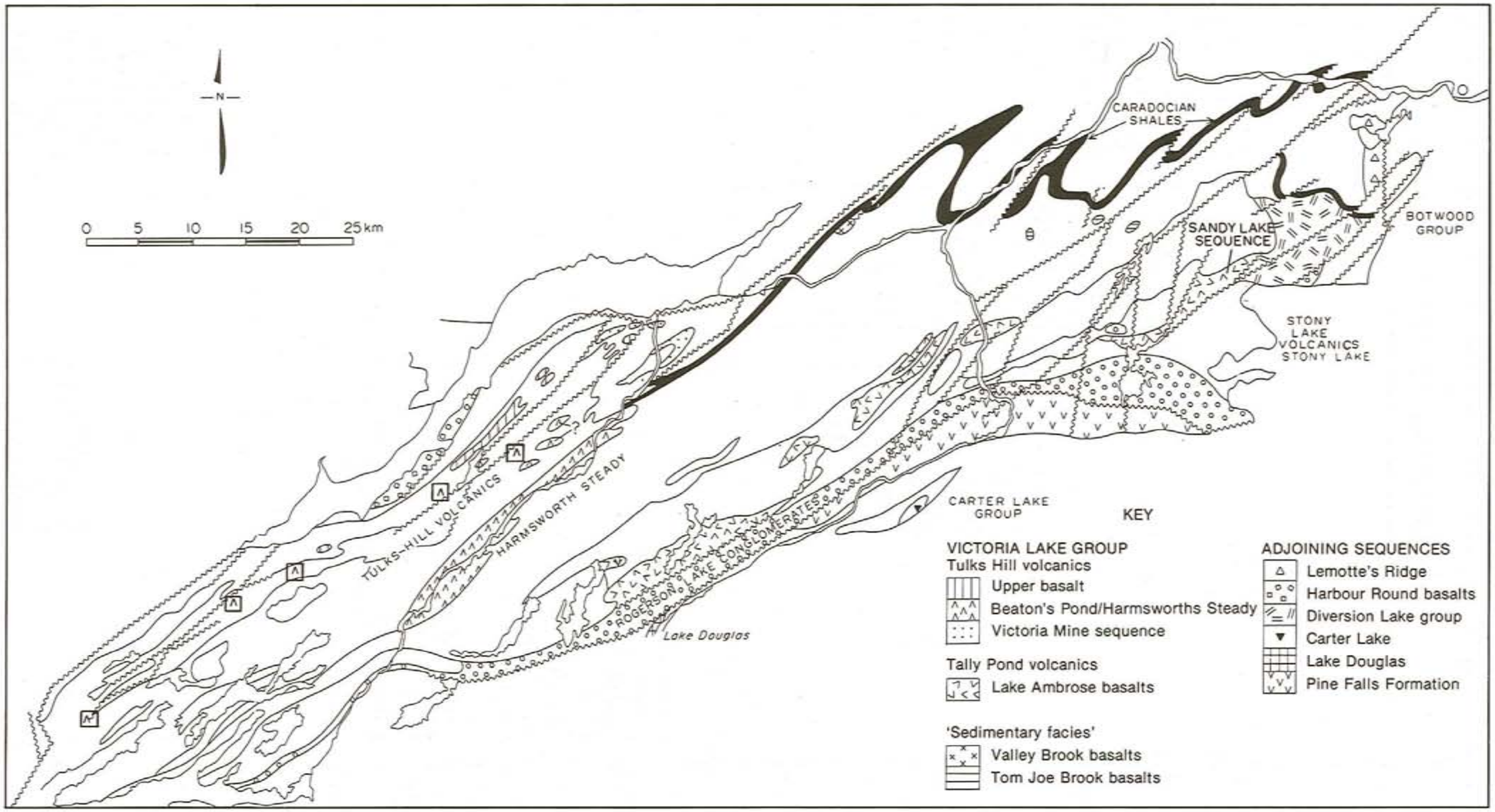

Figure 2. *Distribution of major mafic flow units within and adjoining the Victoria Lake Group (modified after Kean and Evans, 1988).*

Pond volcanics, 2) calc-alkaline basalts represented by the Victoria Mine sequence and 3) non-arc rocks represented by the upper, Valley Brook and Tom Joe Brook basalts and rocks of the Diversion Lake group (Kean and Evans, 1988).

Trace-element studies of these sequences are still in the preliminary stage. However, the island-arc tholeiites contained within the Tulks Hill and Tally Pond volcanics can be subdivided further (Figure 3) on the basis of their trace-element geochemistry (i.e., HFSE, LFSE and REE; Swinden *et al.*, 1989).

In the Tulks Hill volcanics three subdivisions are defined; (1) mafic volcanic rocks of the Harmsworth Steady basalts, interpreted to be slightly to strongly LREE-enriched island-arc tholeiites; (2) the Beatons Pond basalts, associated with the main felsic pyroclastic sequence, interpreted to be strongly depleted island-arc tholeiites and (3) non-arc rocks defined as the Upper basalt. These chemical subdivisions are interpreted to represent a transition from island-arc through rifted-arc to a back-arc setting and conform to the general northwest-facing stratigraphic evolution of the Tulks Hill volcanics.

REE patterns for the Lake Ambrose basalts suggest that these rocks are flat to somewhat LREE-enriched arc-tholeiites (Swinden *et al.*, 1989). Some rocks from the Sandy Lake sequence exhibit highly depleted, concave upward REE patterns indicative of boninites (Swinden *et al.*, 1989). Data for the Tally Pond area is not yet available. The Diversion Lake group appears to consist of LREE-enriched non-arc tholeiites. Tentative interpretations of the geochemistry of Tally Pond volcanics suggest a southeastward transition from arc to non-arc, corresponding to the southeast-facing stratigraphy.

Swinden *et al.* (1989) suggested a spatial association between the volcanogenic massive sulphide deposits and the highly depleted arc-tholeiite volcanic rocks, making these rocks significant in the exploration for base metals. Both the LREE-enriched (Harmsworth Steady and Lake Ambrose basalts) and the non-arc (Upper basalt and Diversion Lake group) sequences are not known to host volcanogenic massive sulphide mineralization.

GEOCHRONOLOGY

Recent age-dating studies in central Newfoundland have lead to significant revisions to the interpretation of the geological evolution of the island. Studies to document and define the age and span of island-arc volcanism represented by the Victoria Lake Group are part of these studies. Geochronolgical (U–Pb) studies (Table 1), within the group, were first undertaken at the northeastern end of the Tulks Hill volcanics near the mouth of Victoria River. At this locality, Llanvirnian to early Llandeilian conodonts recovered from a limestone unit of the Victoria Mine sequence (Kean and Jayasinghe, 1982) provided fossil control for the dating. An age of 462 $^{+4}_{-2}$ Ma (3 point discordia diagram) was obtained from a rhyolite porphyry 20 m below the fossil locality and this age is in agreement with the fossil age (Dunning *et al.*, 1987).

A second geochronology sample was collected from the Tulks Hill volcanics near the Tulks Hill massive sulphide deposit. The sample, from a small porphyry called the Raven rhyolite (Moreton, 1984), yielded a small amount of high-U zircon. Four fractions yielded a simple discordia line having an upper intercept age of 498 $^{+6}_{-4}$ Ma. The age is Tremadoc, and is consistent with the age derived from a single conodont obtained from the Tulks Hill volcanics near Cathy's Pond (Kean and Evans, 1988). These dates indicate that at least two sequences of non-coeval volcanic activity are present within the Tulks Hill volcanics, which must be separated by either a major structural, or stratigraphic, break.

A third age of volcanic activity is represented by the Tally Pond volcanics (Dunning, 1986). Rhyolite porphyries have been dated from near Tally Pond and Lake Ambrose; both yielded small amounts of euhedral zircon, which represents a simple igneous population. Both samples yielded discordia lines (3 fractions and 6 fractions) having identical upper intercept ages of 513 $\pm$ 2 Ma, a Late Cambrian age, making the Tally Pond volcanics one of the oldest known island-arc sequences in the Canadian Appalachians.

Coincident with the felsic volcanic belts of the Victoria Lake Group are a number of linear quartz monzonite intrusions, which have been generally considered to be comagmatic with the volcanic rocks. To test this hypothesis, and attempt to relate major intrusions to particular volcanic sequences, three of these plutons were dated (the Roebucks, the Valentine Lake and Crippleback Lake quartz monzonites). A sample of the Roebucks quartz monzonite, which intrudes the Tulks Hill volcanics, yielded high-quality euhedral zircon prisms and one analysis is concordant at 495 $\pm$ 2 Ma. This intrusion is, therefore, coeval with the dated rhyolite in this belt.

Zircons from the Valentine Lake quartz monzonite represent a simple euhedral igneous population. Two abraded fractions are concordant and 1 percent discordant with $^{207}Pb-^{206}Pb$ ages of 563 Ma, and yielded a crystallization age of 563 $\pm$ 2 Ma. Monazite in the same sample is concordant at 545 $\pm$ 3 Ma, which is interpreted to record an early Cambrian metamorphism.

The Crippleback Lake monzonite, along strike to the northeast, yielded clear to pale brown euhedral zircons and high-quality, angular brown titanite. Abraded titanite overlaps concordia with a $^{207}Pb-^{206}Pb$ age of 561 Ma. Two zircon fractions, co-linear with the titanite, are 1.5 and 7 percent discordant and yield an upper intercept age of crystallization of 565 $^{+4}_{-3}$ Ma.

The Valentine Lake and Crippleback Lake bodies are, therefore, latest Precambrian, coeval intrusions. The isotopic systematics in the zircons and titanite have not been significantly disturbed by a Paleozoic event. Furthermore,

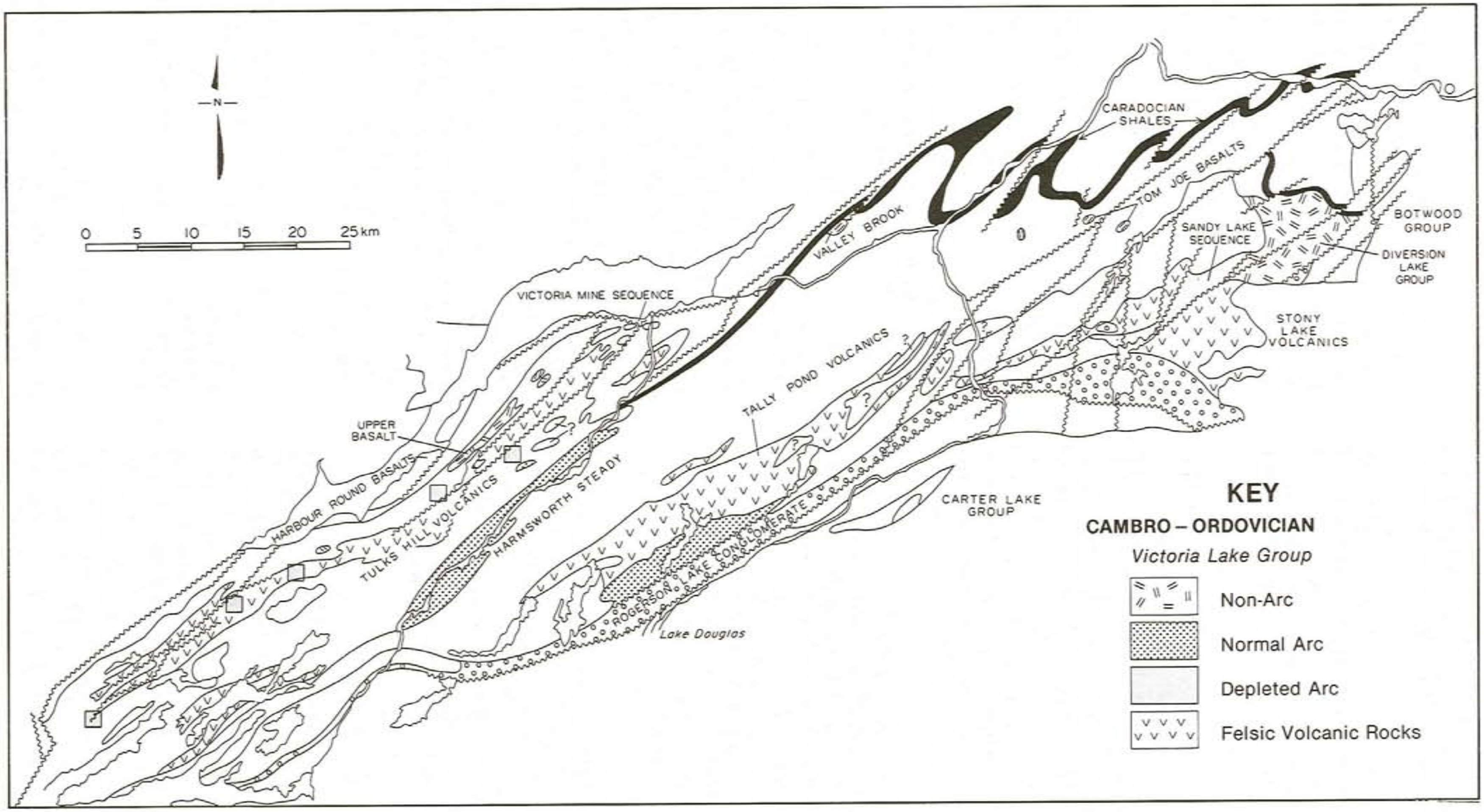

Figure 3. *Geology map showing geochemical affiliation of volcanic rocks within the Tulks Hill and Tally Pond volcanics of the Victoria Lake Group (modified after Swinden* et al.*, 1989). Solid squares are pillow lava outcrops too small to show at this scale.*

the metamorphism of the Valentine Lake intrusion predates all known ages of nearby rocks. These findings indicate that these Upper Precambrian rocks must have been emplaced along a major structural break or breaks within or near the southeast margin of the Victoria Lake Group. The surface expression of one of these breaks is marked by the linear outcrop pattern of the Rogerson Lake Conglomerate.

STRUCTURES AND LINEARS

Rocks of the Victoria Lake Group have previously been interpreted to occupy a regional, northeast-trending anticlinorium called the Victoria Anticlinorium (Kean, 1985). Regionally, the group dips steeply and faces northwesterly on the north limb and dips gently and faces southeasterly on the south limb; however, there are many second-order and third-order folds resulting in variable facing directions. A paucity of outcrop generally precludes detailed structural interpretations.

Regional studies of colour infrared aerial photography, gradiometer data (Geological Survey of Canada, 1985a,b,c,d,e; Kean and Evans, 1988) and Synthetic Aperture Radar (C-SAR) imagery have defined a series of northeast-, north- northeast- and northwest-trending linear structures, a number of which are coincident with known faults. The northeast-trending linears (Figure 4) appear to be the oldest structures, and locally form boundaries between the various rock types and age groupings of the Victoria Lake Group. These structures probably represent thrusts, which have emplaced packages of rocks southeastward, producing the regional anticlinal folding (antiformal stack ?) observed within the group (Figure 5).

New exposures of middle Ordovician black shales and cherts have been discovered within sediments along Victoria River, south of the Lower Ordovician Tulks Hill volcanics. This suggests that the Tulks Hill volcanics represent a package of rocks that have been thrust southeastward over the sedimentary sequence. Furthermore, the Tulks Hill volcanics themselves probably represent a structurally composite package. This is suggested by structural linears developed within the Tulks Hill volcanics, repetition of mafic volcanic units (suggested by geochemical data) and the presence of middle Ordovician-looking black shales and cherts exposed along Tulks Valley.

Small, narrow lenses of black shale are exposed at numerous localities throughout the sedimentary belt. These shales may be interpreted to be part of a once regionally extensive shale sequence that blanketed the sedimentary rocks of the Victoria Lake Group. The narrow, sub-parallel, linear traces of these shales are interpreted to be preserved along thrust faults (Figure 5). One such lensoidal belt of black graphitic shale occurs along the contact between the sedimentary sequence and the Tally Pond volcanics. Along this contact, the sediments are interpreted as having been thrust southeastward over the volcanics, with the Tally Pond volcanics now exposed as a tectonic window through the sediments (Figure 5). An outcrop of polymictic conglomerate, which is similar to the post-middle Ordovician conglomerates (e.g., Goldson Conglomerate), and occurs throughout the northern Dunnage Zone and is exposed on Noel Pauls Brook, may be a further example of repetition due to thrust faulting.

The Precambrian Valentine Lake and Crippleback Lake quartz monzonites, occur along a major northeast-trending linear developed along the southeast margin of the Victoria Lake Group. The mode or time of emplacement of these rocks is unknown. However, they were probably in place by Silurian time as they are nonconformably overlain by the Rogerson Lake Conglomerate. These large plutons were either thrust into place (in which case they may represent basement) to the arc sequences or emplaced along transform fault systems. Metamorphic minerals, monazite and titanite, obtained from the monzonite bodies, provide evidence of Precambrian metamorphism only. This suggests that neither of the monzonite bodies underwent extensive Taconic or Acadian metamorphism. If these Precambrian rocks represent basement to the arc sequences, they were never buried beyond shallow crustal levels.

Reactivation of the northeast-trending, southeast-directed thrusts as transform faults apparently occurred in response to regional sinistral movement along the major boundary fault systems (Cape Ray–Cabot Fault and the Hermitage Bay–Dover Fault; Blackwood, 1985) This model relates the formation of the Hermitage Flexure and other flexures mirrored throughout the Central Mobile Belt to clockwise rotation of the structural elements within the bounding fault system. This flexuring is manifested within the Victoria Lake Group as regional variations in the trend of major geological units and by the shape and orientation of major lakes and river systems (e.g., Red Indian Lake).

Sinistral movement along the major northeast-trending fault systems bounding the Victoria Lake Group (Lloyds Valley fault and the fault defined by the Rogerson Lake Conglomerate) resulted in clockwise rotation of the geological units within the group (Figure 6). Conjugate brittle fault systems (north-northeast and northwest structural linears) developed in response to this rotation, particularly within the sedimentary belt and the Tally Pond volcanics where deformation was less intense and of a more brittle nature. Deformation within the Tulks Hill volcanics was much more intense than in the rest of the Victoria Lake Group with more of the deformation being taken up in northeast-trending ductile shears.

The north-northeast trending structures exhibit a dextral sense of offset, as is portrayed by the mapped offsets on the middle Ordovician shales along the Exploits River (Figure 6). This sense of movement is identical to the sense of movement exhibited by the broken trace of the graphitic shales along the northern edge of the Tally Pond volcanics.

The northwest-trending structures are brittle structures, which appear to exhibit little displacement (Figure 6). The Bonne Bay–Buchans–Tally Pond–Great Burnt Lake linear (Scott, 1980) is an example of one of these structures.

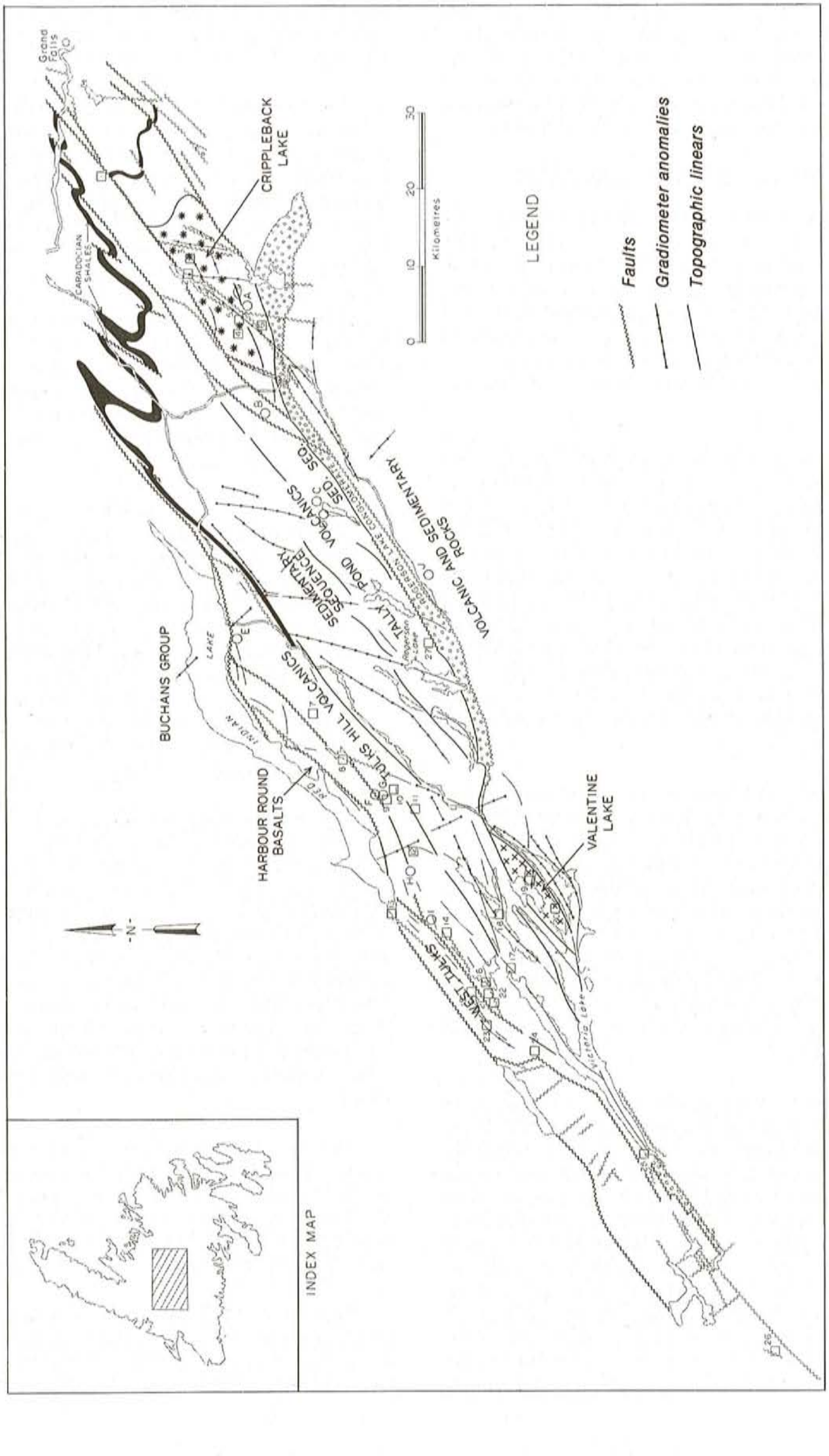

Figure 4. *Major northeast-trending structural linears (heavy lines) and the rock packages they define.*

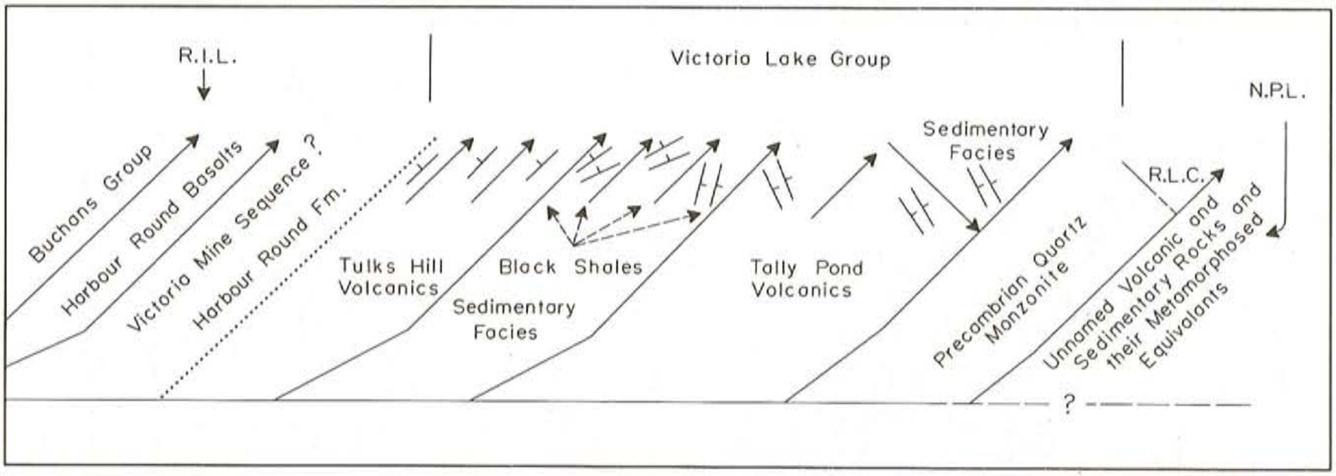

Figure 5. *Schematic cross-section showing southeast-directed thrusting within the Victoria Lake Group.*

$^{40}Ar-^{39}Ar$ dating of sericite from alteration zones associated with massive sulphide and gold mineralization (Kean and Evans, 1988) provided age dates ranging from 395 to 380 Ma. These dates indicate either the age of metamorphism or the last movement along the northeast-trending linears.

MINERALIZATION

Mineralization within the Victoria Lake Group was divided by Evans and Kean (1987) into two main types: (1) volcanogenic massive sulphide, and (2) epigenetic gold mineralization. The former mineralization comprises disseminated and massive stockwork, and exhalative and transported sulphides associated with variably altered felsic volcanic rocks. The mineralization is the same age as the enclosing felsic volcanic rocks and hence, there are at least three ages of volcanogenic mineralization within the group; Upper Cambrian mineralization within the Tally Pond volcanics, lower Ordovician mineralization within the Tulks Hill volcanics and middle Ordovician mineralization within the Victoria Mine sequence of the Tulks Hill volcanics.

Volcanogenic massive sulphide mineralization within the Tulks Hill volcanics appears to be confined to a single time-stratigraphic, locally thickened, horizon of extensive felsic volcanic activity and associated highly depleted mafic volcanic rocks of possible arc-rifting origin. This rifting event might have promoted volcanogenic massive sulphide formation due to a combination of high-heat flow and enhanced permeability, which would promote hydrothermal activity (Cathles, 1983).

The gold mineralization occurs in a number of different geological environments, and may vary in age from Ordovician to Devonian. Epithermal-style alteration is developed within a shear zone at Bobbys Pond. Shear-zone hosted lode gold mineralization and accompanying alteration occurs in a variety of rock types in a number of settings. Lode-gold mineralization having aluminous alteration is developed within sheared felsic and mafic volcanic rocks at Midas Pond. Similar mineralization, hosted by quartz veins, is developed along a deformed nonconformity between the Silurian(?) Rogerson Lake Conglomerate and the Valentine Lake quartz monzonite.

Gold mineralization appears to be restricted to the more deformed sections of the Victoria Lake Group. There appears to be a spatial relationship between the gold mineralization–alteration and structural linears (Figure 6), particularly in the Tulks Hill volcanics and along the southeast margin (major structural break) of the Victoria Lake Group. Narrow, northeast-trending shears with associated carbonate alteration, developed within a gabbro phase of the Valentine Lake quartz monzonite along Victoria River, contain anomalous gold values (585 ppb). Deformation within the Tulks Hill volcanics and along the southern margin of the group is more intense and is of a brittle–ductile nature. The major northeast-trending, deep-seated, ductile shears may have focused fluid-flow upward (Figure 7) into the secondary and tertiary brittle–ductile shears where the mineralization–alteration occurred. Similar styles and settings of mesothermal gold mineralization are well documented elsewhere, particulary from the Archean greenstone belts, a good overview of which is given by Kerrich (1989).

If the gold mineralization is related to movement along these structures and the last movement along these is in the 395 to 380 Ma range, then this provides an upper age limit on the gold mineralizing processes.

CONCLUSIONS

The Victoria Lake Group is a composite sequence consisting of at least three age groupings of volcanic rocks; a Cambrian arc sequence (Tally Pond volcanics), a Lower Ordovician arc sequence (Tulks Hill volcanics) and a Middle Ordovican sequence (Victoria Mine sequence). Mafic volcanic rocks within the Tulks Hill, and possible Tally Pond, volcanics appear to record the transition from arc through rifted arc to back arc. Volcanogenic massive sulphide mineralization is related to the arc-rifting process.

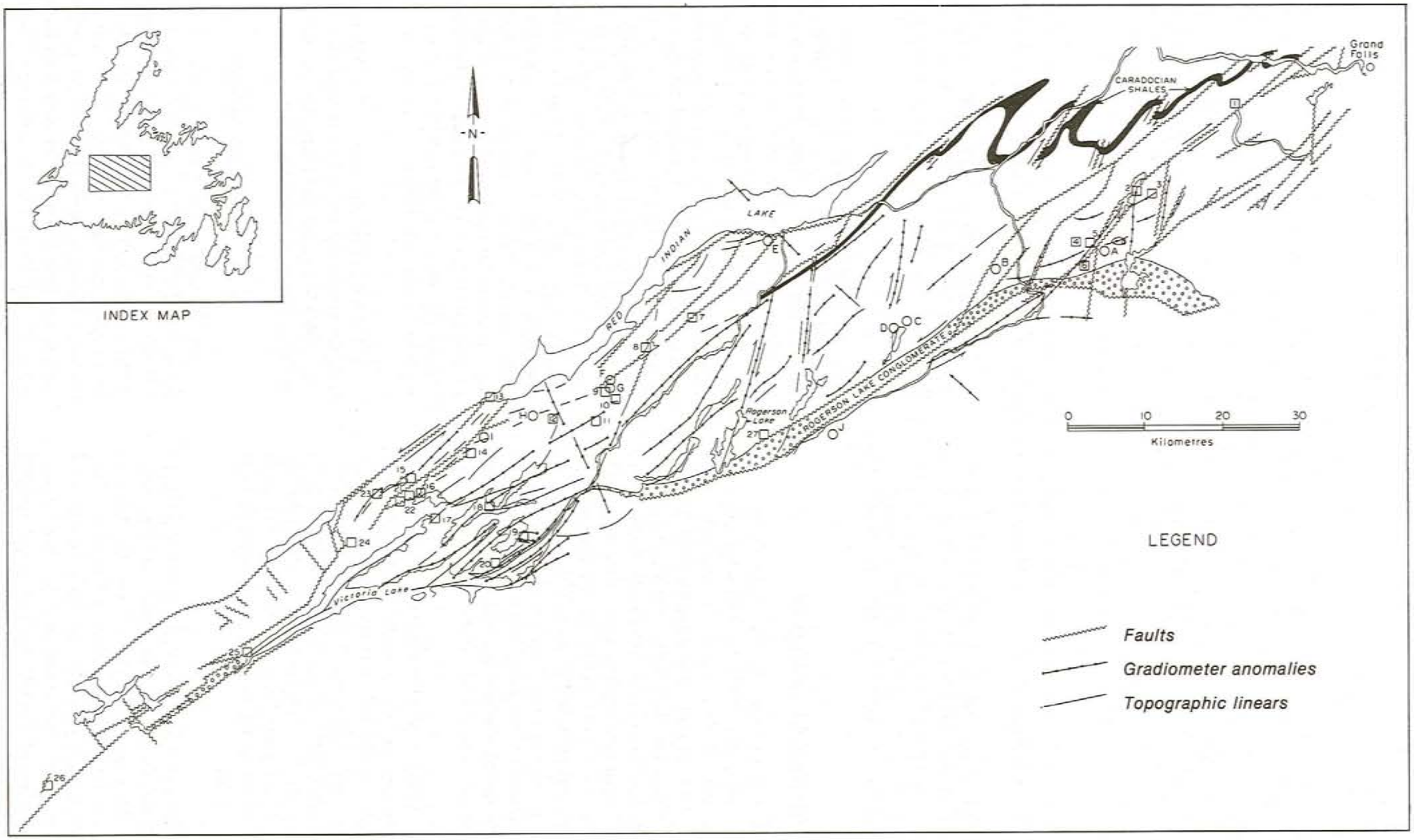

Figure 6. *North-northeast and northwest structural linears. Arrows show the direction of movement along the fault systems.* □ *represents gold mineralization or alteration;* ○ *volcanogenic massive sulphide mineralization (modified from Kean and Evans, 1988).*

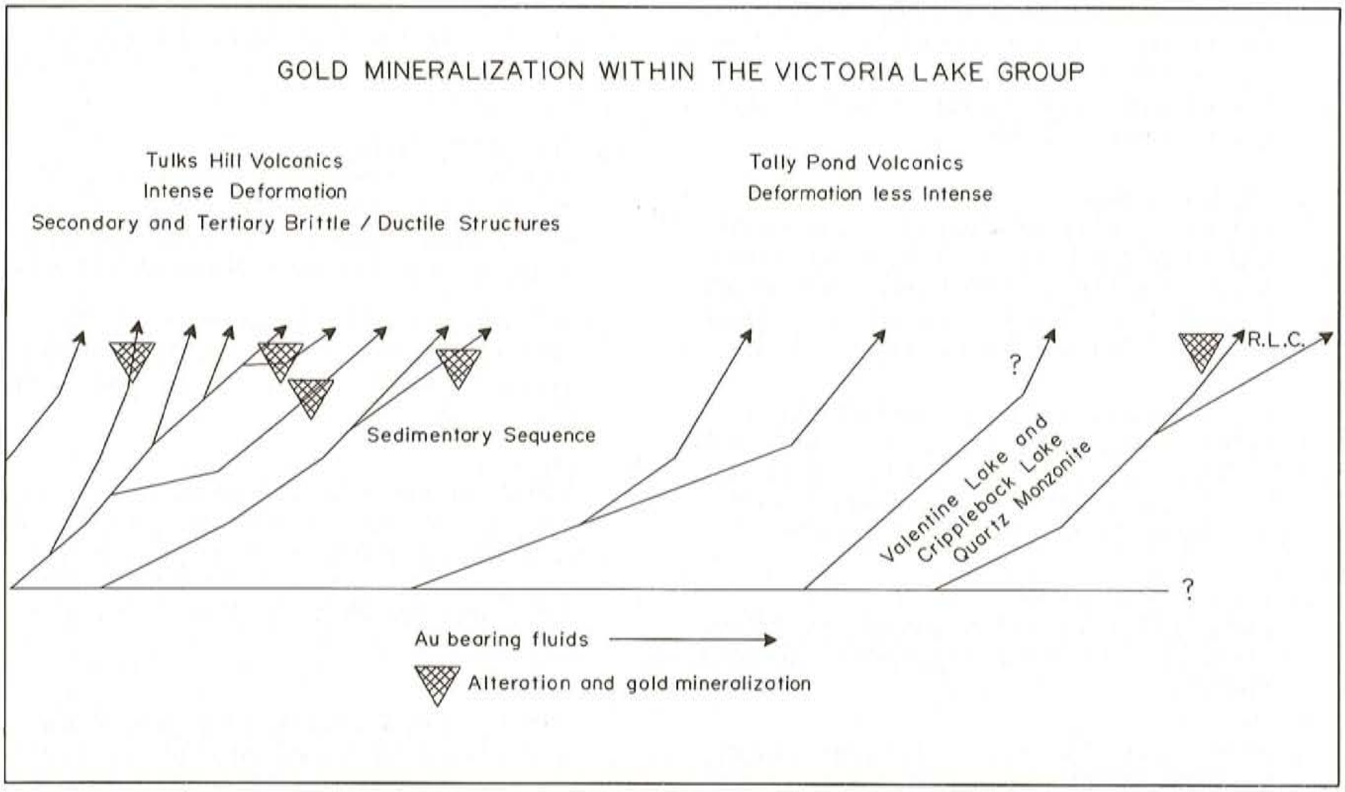

Figure 7. *Gold mineralization model within Victoria Lake Group. Au bearing fluids passed upwards through the ductile shears and were focused into the secondary and tertiary brittle-ductile structures where the alteration and mineralization developed.*

The present distribution of the geological elements within the group can be explained in terms of the southeastward-directed thrusting of packages of rocks along northeast-trending linears. Later reactivation of a number of these structures as sinistral, transcurrent faults produced the flexuring and a conjugate fault pattern observed within the Victoria Lake Group. Gold mineralization is spatially related to the linears, particularly in the Tulks Hill volcanics and along the trace of the Rogerson Lake Conglomerate where deformation is more intense. Secondary and tertiary brittle–ductile structures provided the pathways and acted as the loci for the deposition of gold mineralization and accompanying alteration.

In light of these revisions to the geology of the Victoria Lake Group, it may be necessary to elevate the group to supergroup status. Informal subdivisions, such as the Tulks Hill and Tally Pond volcanics, may be defined as having group status.

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