

The Healey Lake area lies across part of the boundary as presently mapped between the Slave Structural Province and the Queen Maud Block (Heywood and Schau, 1978) of the Churchill Structural Province. Within the area there is a transition from typical Slave Province geology with low to intermediate grade Archean metavolcanics and sedimentary rocks with curvilinear structural trends intruded by massive granitoid rocks through to Archean higher grade gneisses, foliated granitoids and linear structural patterns of the adjacent Queen Maud Block. An Archean low pressure metamorphic gradient increases from greenschist in the northwest to granulite grade in the southwest across the area. Superimposed on the Archean geology is an intermediate pressure Proterozoic metamorphism that was accompanied or preceded by cataclastic to mylonitic deformation that is most evident in the north northeasterly trending straight zone in

The following notes are taken mainly from a series of reports on fieldwork in the area (Henderson, 1979; Henderson and Thompson 1980, 1981; Henderson, Thompson and James, 1982). Recent additional sources of information on the region include Frith (1981) Frith (1982) (area north of the Healey Lake area) and Lambert (1982) (Back River volcanic complex).

YELLOWKNIFE SUPERGROUP The Yellowknife Supergroup has been defined as "any Archean volcanic and sedimentary

assemblage within the Slave Province" (Henderson, 1970). The eastward extension of the Yellowknife rocks, as defined, in the Healey Lake area depends on the location of the Slave Province boundary which is a postdepositional structural marker: the Thelon Front. Because the precise location is uncertain, all metasedimentary and metavolcanic rocks that occur throughout the area are considered part of the Yellowknife Supergroup. This is reasonable as the rocks are similar to Yellowknife rocks elsewhere in the Slave Province. As is typical of most of the Slave Province, sedimentary rocks (unit 6) of the Yellowknife Supergroup are more abundant than volcanic rocks (units 2-5). The sediments consist almost

entirely of metamorphosed greywacke-mudstone turbidites and vary only in the proportion of pelitic to psammitic components. In the western part of the area where the rocks are at relatively low grade, primary structures are locally preserved. To the east, with increasing grade of metamorphism and degree of deformation, all primary features other than compositional layering are lost as the rocks become migmatitic. Metasedimentary units mostly occur in large continuous areas as are present northwest of Tourgis Lake and west of Healey Lake. On the other hand in the terrane east of 'Lake 1180' in the north central part of the area the metasediments are extensively intruded by granodioritic

phases and the surrounding granodiorite contains abundant inclusions of metasediment. The migmatitic metasediments west of the contact with the intermediate metavolcanics near Tourgis Lake contain abundant layers of coarse garnet amphibolite generally less than one meter thick that have been tightly folded with the metasediments and are thought to be metamorphosed In the north northeasterly trending cataclastic straight zone west of Moraine Lake, the Yellowknife metasediments are recognizable as the milled equivalents of the metasedimentary

probable metasedimentary origin. Yellowknife Supergroup volcanic rocks (units 1-5) occur in four main centres or zones in the map area. With minor exceptions the volcanics are of andesitic or more felsic composition. The lowest grade, least deformed Yellowknife rocks occur in the northwest corner where part of the Back River volcanic complex, composed mainly of intermediate to felsic tuffs, breccias, lava flows, and domes, occurs north and west of the Back River. It has been mapped in detail by Lambert (1976, 1977, 1978, 1982), who has recognized both subaerial and subaqueous environments in the evolution of the complex that culminated in the collapse of a large cauldron.

A major volcanic center occurs at and about Healey Lake. The most mafic rocks occur on the large peninsula in the center of the lake and consist of both pillowed and massive flows and fragmental units of probable basalt-andesite composition. Most of the complex to the north, south and west is compositionally heterogeneous, ranging from andesite through dacite to rhyolite. The rocks are dominantly moderately foliated, fine grained, grey-green to dark green, plagioclase amphibole rocks that are texturally and compositionally layered on a 10 to 30 cm scale. The volcanics are mainly fine grained fragmental units with coarser breccia units locally preserved. Layering is accentuated by centimeter scale units of darker, more mafic material separating the slightly coarser, thicker, more feldspathic layers. White units of fine grained rhyolite are locally present. Carbonate occurs in thin laminae to layers locally up to several meters thick and is commonly associated with the more felsic units. Although present to some degree in most volcanic successions, carbonate units are most abundant in the volcanics northwest of Healey Lake. South southeast of Healey Lake two thick sequences of dominantly

dacitic metavolcanics are separated by a thin septum of metasediments. scontinuous units of similar, mainly if the margin of the block of granitoid gneisses (unit 1) thought to be older than the Yellowknife

east. The northwestern part of the complex consists, in large part, of well layered, somewhat more felsic fragmental rocks while to the southeast, more mafic, locally pillowed flows, are Along the east margin of the area volcanic rocks are at the highest grade and are the most deformed of any in the area. North of Tourgis Lake these metavolcanics are now gently to moderately eastward dipping migmatitic rocks that were probably originally of andesitic to dacitic composition. These migmatites consist of layers one centimeter to a few decimenters thick that are defined by variations in texture and proportion of plagioclase, amphibole, biotite and garnet. Interlayered with them are discontinuous centimeter scale lenses to layers of white, coarser grained, quartz plagioclase leucosome. Minor sedimentary units are present within the mafic migmatites. To the south the rocks are involved in the north northeasterly trending steeply dipping straight zone. The metavolcanics are locally migmatitic but are more commonly deformed to a featureless fine grained pinkish grey to greenish grey quartz-feldspar-hornblende-

at least in part basement to the Yellowknife Supergroup. It is a highly complex hetergeneous unit that has not been subdivided but could be with more detailed mapping. Composition ranges from metadiorite to granite and the rocks are texturally diverse. Within the unit are massive granitoid bodies, complexly folded, compositionally layered gneisses and granitoid migmatites. Much of the unit is extensively recrystallized as, for example, near the west end of the complex where an originally coarse augen granodiorite now occurs as a medium grained equigranular rock, its original coarse texture evident only by the distribution of biotite. The unit differs from the typically massive granitoids in the western part of the area in that complexly deformed gneisses and granitoid migmatites occur in the western as well as eastern parts of the area. At Healey Lake and to the east, massive phases are no longer present and all facies of the unit are foliated with a pronounced northerly to north northeasterly trend. Granitoid units within and east of the straight zone are included in this unit. They are highly heterogeneous, commonly intruded by mafic bodies and locally contain granulite grade metamorphic mineral assemblages. Very high grade remnants of supracrustal rocks occur in this unit and may be equivalent to the Yellowknife supracrustal rocks to the west. The correlation remains uncertain due to the very high grade and the degree of deformation of these rocks. Throughout the area contacts between this unit and the Yellowknife

Parts of this unit may be older than the Yellowknife Supergroup as suggested by the lithological and structural complexity of the unit, particularly in the west where it contrasts strongly with the relatively simple structural style and intermediate metamorphic grade of the Yellowknife rocks. Although no unconformities have been recognized, narrow discontinuous metavolcanic units of intermediate composition occur along it's margins. In this respect it is similar to the somewhat larger basement block east of Yellowknife in the southern Slave Province (Henderson, 1976), and the Hanimor complex 100 km to the northwest (Frith, 1981). POST YELLOWKNIFE INTRUSIVE ROCKS

Some ten units of intruive plutonic rocks (units 7-16) have been defined on the basis of compositional and textural criteria. Three Proterozoic mafic dyke sets are defined by their trend. In general the granitoid units are dominated by intermediate to mafic compositions. In the west part of the area a suite of mainly tonalitic to dioritic plutonic bodies (unit 11) intrudes the sediments. They are mainly massive, medium grained dark pinkish grey, equigranular and hornblende and biotite rich. Locally they are as felsic as granodiorite and as mafic as gabbro. Rarely a weak foliation is developed. Their contacts with the sediments are sharp, they form few or no cykes in the sediments and the contact zones contain only minor inclusions of country rock. These intrusions are part of the Regan Lake Intrusive Suite (Hill and Frith, in press). The large body southwest of Healey Lake is included with this unit on compositional grounds although texturally it is more varied (i.e. locally megacrystic). In the north central part of the area is a northerly trending quartz tonalite (unit 8). It is a massive to locally weakly foliated grey, coarse grained, biotite rich pluton which is quite homogeneous throughout most of its outcrop area. It is characterized by abundant coarse masses

of typically iridescent quartz up to one centimeter or more in size. This pluton contains only minor inclusions near its comact with the metasediments. Its relationship with the tonalitediorite (unit 11) to the west is unknown, but it is intruded by the large granodiorite (unit 15) on its southeastern side, as shown by abundant dykes in the contact area. The diorite (unit 7) that occurs east of the quartz-tonalite is a rather heterogeneous massive but more commonly foliated, dark grey, hornblende and biotite rich, equigranular, medium grained body whose contact with the quartz-tonalite was not observed but which may be gradational. It also is intruded by the two mica granite to the south and is, at least in part, in

fault contact with the rocks to the east. To the east is a large unit of undivided granodiorite, tonalite, and locally diorite (unit 13). These rocks are almost everywhere strongly foliated and locally contain abundant small inclusions to mappable units of Yellowknife rocks. East of Lake 1180 the unit consists of a heterogeneous assemblage of small, deformed, inclusion-free plutons with intervening, more foliated, granodioritic rocks with abundant metasedimentary inclusions. The plutons are, for the most part, white, medium grained, equigranular, mafic-moderate to -poor granodiorites and tonalites. North of the lake, a well foliated, biotite rich, augen granodiorite body (unit 12) lies within the granodiorite.

West of Tourgis Lake, the largest intrusive unit in the area is a dark grey tonalite (unit 9) that is medium grained, inequigranular to equigranular, and contains abundant biotite and/or hornblende. The unit is remarkably uniform considering its size. In general it has a weak to moderately developed foliation and rarely, deformed gneissic layering. In places, well exposed more massive, several kilometre scale lobes of the tonalite are outlined by foliated zones of generally more mafic tonalite with inclusions of possible metasediment. Two mica granite-granodiorite (unit 15) underlies a large part of the area between Tarantula and Clinton-Colden Lakes. Several irregularly shaped bodies occur in a generally northwest trending zone that conforms to the regional northwesterly structural trend in the northeast Slave Province that is evident on small scale maps (Fig. 1). It occurs as a leucocratic, massive, medium coarse grained, equigranular to rarely megacrystic rock with highly variable amounts and proportions of biotite and muscovite. Associated pegmatites occur locally including

one spodumene bearing pegmatite that occurs in metasediments near a pluton of two mica granite west of Clinton-Colden Lake (UTM zone 13 362100 701800). Somewhat similar two mica granites occur southwest of Healey Lake where they are generally foliated and contain abundant inclusions to screens of metasediment. Between Healey Lake and the major areas of the unit to the west are abundant small stocks intruding the metasediments. A circular pluton of similar, fairly homogeneous, massive to weakly foliated granite occurs in the north central part of the area where it intrudes all surrounding units. In the southwest part of the area are several small plutons and one large body of biotite

granite to granodiorite (unit 14). In general the rocks is massive although commonly has a marginal foliation, is pink to buff to grey to grey-green, and medium grained although locally coarse grained. Most bodies are inequigranular with megacrysts up to 3 cm although size and proportion is varied in the various bodies. Biotite content is also varied from moderate to poor. An east-west line of small massive coarse grained black altered ultramafic stocks occurs north of Clinton-Colden Lake (unit 10). Only one was observed in outcrop. The others were recognized from their distinctive aeromagnetic pattern while the eastern most one was recognized from a concentration of coarse, rather altered blocks and does not have a magnetic

a distinctive pink, medium grained massive granite (unit 16) with few or no mafics but containing epidote. Although these granites outcrop poorly they contrast markedly with the strongly deformed rocks they intrude. They may be post-Archean in age. Three Proterozoic dyke sets occur within the area. The north northwesterly trending Mackenzie dykes (unit 18) occur throughtout the area and are everywhere unaltered. They have a distinctive aeromagnetic pattern. The other two sets (unit 17) are older than the Mackenzie dykes although their mutual age relations are unknown. One set has an east-west trend and has been recognized as far west as Point Lake in the central part of the Slave Province. These dykes are relatively unaltered in the western part of the area but in the eastern half they are metamorphosed and, although the trend of the dykes is not seriously distorted, they develop a distinct northerly trending foliation. The second set has a northesterly trend and is common in the areas to the north where it has been named the Malley diabase (Frith, 1981, 1982). In the Healey Lake area it is not as abundant as the east-west set but like it, is relatively unaltered in the west and becomes metamorphosed and foliated in the east half. With one exception no dykes have been recognized within or east of the straight zone although in this area there are abundant mafic intrusions, generally parallel to the regional foliation.

STRUCTURAL GEOLOGY There is a striking change in structural style across the map area. The orientation of the principal foliation and major lithologic contacts change from a complex curvilinear pattern in the west to a northerly trending linear pattern in the east half of the area. In the northwest corner the main part of the large structurally competent volcanic complex is essentially flat lying (Lambert, 1982) but the adjacent metasediments are complexly deformed with the foliation in the metasedimentary rocks wrapping around the tonalitic/dioritic masses and the volcanic complex. Near the Back River the principal foliation, or dominant schistosity, foliation or gneissosity in outcrop, is the second phase of deformation in that the foliation is axial planar to isoclinal folds that deform an older foliation and bedding. To the east and at higher metamorphic grade, the principal foliation has generally a northerly to north northeasterly trend and in general dips steeply to moderately (in the northeast) east. The transition zone from one to the other is shaped like an open S with the curvilinear pattern persisting farther east in the south (Fig. 2). In the eastern half scattered M shaped minor folds involving the principal foliation and local changes in attitude indicate this surface has been folded into the present attitude during a later deformation. The steep to moderate, mainly easterly dip of the principal foliation may indicate that the northerly trending structures are overturned to the west. Both

older than the time of dyke emplacement. The age of the dykes is not known but as most mafic dyke sets in the Slave Province are older than 2 Ga, the age of the northerly trending deformation is probably Archean or at most, early Proterozoic. A later Proterozoic deformation has also affected the eastern part of the area. The two older dyke sets within this part of the area are metamorphosed to amphibolite (see below) with the metamorphic amphibe forming a foliation parallel to the principal foliation in the rocks they intrude. Southeastern-most dykes are commonly broken into segments along surfaces parallel to the regional foliation. Individual segments maintain their original orientation. Reactivation by shearing could account for the foliation and displacement. A striking feature on the southeastern part of the area is a north northeasterly trending 'straight zone' up to 5 km wide. This prominent feature has a pronounced topographic expression with lakes within it being very long and narrow. It corresponds closely to a magnetic 'trough' on the much higher and very irregular magnetic topography to the east (Fig. 2). The inflection zone between a prominant negative Bouguer gravity anomaly to the west and a positive anomaly to the east (60 milligals over 100 km) also coincides in part with the straight zone. The rocks within the zone are predominantly cataclastically deformed and metamorphosed members of the Yellowknife Supergroup whose trend differs significantly from the more northerly trend of the 'ellowknife rocks to the west. However, if the principal foliations in the granitoid as well as supracrustal rocks are considered, there is a gradual convergence of the foliations inside and outside the zone. The belt of foliated supracrustal rocks involved in the straight zone diverges away from it to the north at about Tourgis Lake while, on the basis of the continuation of the magnetic trough, the straight zone continues to the north northeast beyond the map area to the Bathurst fault. The straight zone formed after the main Archean metamorphism as Yellowknife migmatites are crushed during the deformation. A medium grade metamorphic assemblage (kyanite-biotite-muscovite) in the shear zone implies deformation was older than or synchronous

In addition to the straight zone, several other shear zones have been recognized. The largest of these is a north trending structure up to several hundred meters wide 10 km west of Tourgis Lake. The zone is a ductile shear that in the north contains the highly crushed equivalents of migmatized metasediments, garnet amphibolite sills that are strongly and steeply lineated and severely mylonitized granitoid sills. Migmatitic metasediments occur on both sides of the structure but the proportion of leucosome is higher to the east and kyanite is absent to the west. This structure continues another 30 km to the north of the area (Frith, 1982). To the south, in the large tonalite body, the exposure is rather poor but there is a consistent topographic expression of the structure and scattered outcrops and felsenmeer blocks are strongly foliated. It merges with the north northeasterly trending straight zone to the south. At this point the inflection contour between the major positive and negative gravity anomalies that is coincident with most of the straight zone within the area to the south swings away and becomes essentially coincident with the northerly trending shear zone (Fig. 2). A series of wide mylonite zones occurs in the eastern part of the granitoid gneisses east of Clinton-Colden Lake and south of Healey Lake. Like the previously discussed structure, the

trend of these zones is northerly. In the granulite terrane east of the straight zone are a series of relatively narrow shear zones that are parallel to both the major straight zone and the high relief aeromagnetic grain characteristic of this terrane. Another major shear zone has a northwesterly trend and occurs north of the block of granitoid gneiss northwest of Healey Lake and south of but partially within the quartz tonalite body to the north. In the northwest this structure is a narrow brittle fault but to the southeast, within the quartz tonalite, it broadens to a ductile shear zone several kilometres wide before disappearing east of 107°.

They have a similar trend and sense of displacement to the McDonald fault 90 km to the south of

NOTES

REGIONAL METAMORPHISM Two phases of regional metamorphism have altered the rocks of the Yellowknife Supergroup and some of the granitoid rocks within the map area. The predominant early phase, Archean in age, is represented by isograds in metasedimentary rocks (Fig. 1), indicating the metamorphic grade increases southeastward. Superimposed on the early phase is a second metamorphic gradient (Fig. 2) that is most easily recognized in the field by metamorphism of Proterozoic diabase dykes.

Several northeasterly trending faults have been mapped in the eastern part of the area.

The early metamorphism is mainly the low pressure type characteristic of the 2600 Ma event in the Slave Province (Thompson, 1978). Cordierite, sillimanite and migmatite (greater than 10% leucosome) isograds are mapped in the metasediments. In pelitic schist and metagreywacke, chlorite-biotite occurs at lowest grade and cordierite-biotite, cordieritebiotite-andalusite and staurolite-biotite-andalusite at medium grade, with sillimanite appearing as grade increases. Ultimately these rocks become biotite-garnet-sillimanite migmatites locally containing kyanite in both the neosome and paleosome. The orthopyroxene isograd is mapped in the granitoid rocks east of the straight zone. With the granulite terrane, orthopyroxenes are deformed in the shear zones that post date the Archean metamorphism. This supports the suggestion that the granulite terrane is a continuation of the Archean metamorphic gradient rather than a product of the later Proterozoic metamorphism. While it seems unlikely that the granulites are Proterozoic in age, the possibility that the granulites are pre-Yellowknife Supergroup remains.

Commonly, textural relations between porphyroblasts and microstructures indicate porphyroblastic growth outlasted the main phases of deformation but some rocks contain

evidence of significant deformation after growth ceased and leucosome in migmatitic rocks can

be intensely folded. In the metasedimentary rocks in the northcentral part of the map area in particular, but also elsewhere downgrade of the migmatite isograd, white mica and chlorite occur in the matrix and coarse white mica or white mica and chlorite have replaced the porphyroblasts. These retrograde textures and mineral assemblages may be related to cooling after the thermal maximum or to low grade conditions during the later metamorphism. The influence of the later metamorphism is most obvious in the older Proterozoic dykes which change eastward from brown-weathering dykes with diabasic textures to black weathering, foliated and lineated amphibolites (Proterozoic isograd on map) in which the amphibole in thin section is seen to change from blue-green to yellow or brown-green. Garnet poikiloblasts are present in the easternmost examples. Prograde clinopyroxene has not been observed. In pelitic rocks, later metamorphism is expressed as muscovite-rich seams containing chlorite and euhedral staurolite which cut across the leucosome of biotite-garnet migmatite and by chlorite-kyaniteeuhedral staurolite and kyanite-chloritoid-staurolite-chlorite assemblages superimposed on an older staurolite-biotite-andalusite-sillimanite assemblage. Mineral assemblages attributed to later metamorphism are typical of intermediate pressure, lower to middle amphibolite facies. Kyanite occurs in Yellowknife metasedimentary rocks (unit 6m) in a narrow zone east of the shear zone west of Tourgis Lake and in lower grade equivalents (unit 6s) of these rocks at and

east of Healey Lake. In several places field observations and petrography indicate that kyanite formed before or during Archean migmatization. metamorphism temperatures peaked during or after the main phases of deformation, the presence of kyanite in migmatite suggests maximum pressures may have been reached in the highest grade rocks before the temperature maximum (Henderson and Thompson, 1980). If the kyanite can be shown to be a product of a melting reaction rather than inherited from an earlier stage in the metamorphic history, pressure at which melting occurred in the estern part of the area would be 7 kilobars or higher, significantly greater than the pressures (3-5 kbar) normally associated with lower pressure type regional metamorphism as seen in most of the Slave Province. Kyanite in association with chloritoid and staurolite also occurs as small subedral grains within Archean andalusite porphyroblasts near Healey Lake. Although chloritoid and staurolite are readily attributable to the later metamorphism, textural relations of kyanite are sufficiently ambiguous that nucleation of andalusite on the high pressure polymorph is also a reasonable explanation. On the other hand, textures in a kyanite bearing rock from the straight zone imply that the kyanite is younger than the mylonitization of the Archean migmatites. The available evidence points to a complex P-T history for this eastern terrane with supracrustal rocks being taken down to depths compatable with the formation of kyanite and raised again

With the exception of the southwest quadrant and the plutons of unit 16, the granifold rocks in the area show varying degrees of metamorphic crystallization and deformation. For example, the granodioritic to quartz/dioritic plutons known to intrude the Yellowknife Supergroup east of the Back River exhibit textures and mineral assemblages compatable with the regional metamorphic grade of the adjacent metasediments suggesting they are older than the metamorphism. In the central part of the map area, leucocratic, muscovite-biotite granitegranodiorites have intruded regionally metamorphosed rocks and are themselves foliated and recrystallized. The basement granitoid gneiss unit is in part composed of isoclinally folded partially migmatized granitoid rocks that predate deposition of the Yellowknife Supergroup.

On the basis of 1:1 000 000 scale geological reconnaissance across the northwestern Precambrian Shield (Wright, 1957, Fraser, 1964) Wright (1967) described the Thelon Front as a feature which marked changes in lithology, metamorphic grade and structural style that reflected the farthest westward extent of the 'Hudsonian orogeny' and was thus the boundary between the Slave and Churchill Structural Provinces. He described the 700 km long boundary as "...gradational, probably over several miles..." but pointed out that "...on the present regional scale it appears as an abrupt, clearly defined feature...".

In the area between the Bathurst and McDonald faults, which includes the Healey Lake

area (Fig. 1), the term Thelon Front was applied to a transition eastward from a terrane where undeformed granitoid plutons intrude medium grade metasedimentary and metavolcanic rocks of the Yellowknife Supergroup to a gneissic terrane with abundant foliated granitoid rocks. The sinuous nature of the transition line as originally defined within the Healey Lake area (Fig. 2) appears to be related to variations in foliation trend which on the basis of scattered K-Ar mica ages were interpreted as Hudsonian features. Gibb and Thomas (1977) noting the proximity of the geological change with the steep gravity gradient suggested the feature is a suture formed during a Proterozoic collision between the Slave craton and the rocks of the Churchill Province. In Figure 2 various metamorphic, structural and geophysical boundaries are compared with the location of the Thelon Front as originally defined in the Healey Lake area. A complex scenario is indicated. None of the prominent geological or geophysical features of Archean age coincide with the front as presently defined. For example the Yellowknife Supergroup rocks extend completely across the area to the eastern boundary and the striking structural change across the area appears to be either Archean or early Proterozoic but almost certainly pre-Hudsonian (1.75 Ga). There is, however, the later cataclastic to mylonitic structures that predate or are synchronous with a younger Proterozoic event. The Proterozoic K-Ar ages (in the Healey Lake area 1630 ± 90 Ma K-Ar muscovite 10 km southeast of Healey Lake) may represent cooling ages

The straight zone in the southeast corner of the area is perhaps the best condidate for a single boundary feature if such a line must be selected. It would appear to be the most prominent of a series of mylonitic zones with similar trend that continue beyond the map area to the east. It is a feature that corresponds at least in part to two geophysical features. On the basis of its magnetic and geomorphological expression it would appear to be a mappable structure beyond the Healey Lake area to at least the Bathurst fault 75 km to the northeast and to the McDonald fault 100 km to the southwest.

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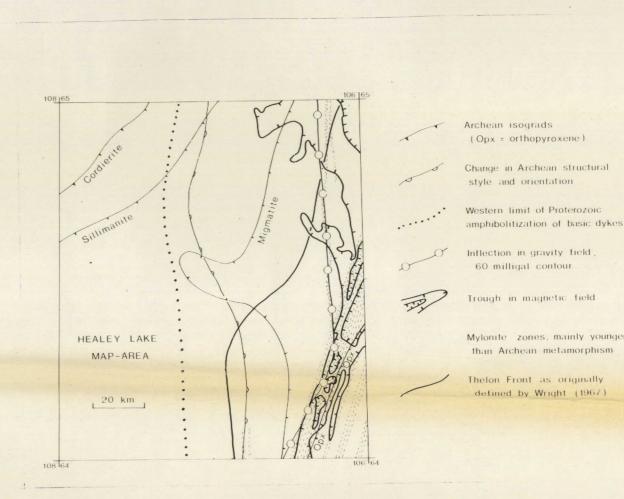


Figure 2 Distribution of various geological and geophysical features with respect to the position of the Thelon Front as originally defined by Wright (1967). The predominant metamorphic gradient is Archean and the regional change in structural style and orientation from west to east is also Archean or early Proterozoic. Following the intrusion of Proterozoic diabase dykes, a later phase of metamorphism and some reactivation of the pre-dyke structure occurred. Deformation in major mylonite zones is younger than Archean metamorphism but the same age or older than the later metamorphism. Both a large part of the inflection of the gravity field between major positive and negative gravity anomalies and a prominent linear negative magnetic anomaly are coincident with a major cataclastic straight zone. This feature is considered a good candidate for a revised position of the Thelon Front.