THE FRASER COMPLEX—A MAJOR LAYERED INTRUSION IN WESTERN AUSTRALIA

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ABSTRACT

A survey of the Fraser Complex shows that most of the pyroxene granulites are derived from basic igneous rocks and form part of a major layered intrusion. No evidence was found to substantiate the interpretation of Wilson (1969a), supported by Tyrwhitt and Orridge (1975), and Bunting and others (1976), that most of the pyroxene granulites represent metamorphosed volcanic rocks.

The Fraser Complex is redefined to include only the layered basic plutonic rocks, and is divided into five tectonostratigraphic units. Contacts of the units are zones of intense deformation, and the basic plutonic rocks are tectonically interleaved with metasedimentary rocks mainly quartzite and gneiss. All these rocks have been intruded by sheets of porphyritic granite and pegmatite, strongly deformed, and metamorphosed to granulite facies. Deformation was heterogeneous, and parts of the Fraser Complex preserve undeformed igneous textures and igneous cumulate mineral assemblages.

INTRODUCTION

The Fraser Complex is part of the Albany-Fraser Province (Doepel, 1975; Gee, 1979), a Proterozoic mobile belt, over 1 100 km long and 200 km wide, which extends along the southern and southeastern margin of the Archaean Yilgarn Block (Fig. 1). The mobile belt consists of strongly deformed ortho- and paragneisses of amphibolite or granulite facies, mafic dykes, and granite intrusions. The structures and intrusions of the mobile belt cut sharply across structures of the Yilgarn Block and, in the region west of Hopetoun, high-grade metasedimentary rocks are thrust northwestwards from the mobile belt over lower grade metasedimentary rocks on the edge of the Yilgarn Block.

Rocks from the Albany-Fraser Province have given Rb-Sr ages in the range 1.8-1.1 Ga (Turek and Stephenson, 1966; Arriens and Lambert, 1969; Doepel, 1975; Bunting and others, 1976; Thom and others, 1981). Most of these ages fall into 3 groups which appear to be related to the following sequence of events:

(a) An early metamorphic and tectonic episode 1.8-1.6 Ga ago involving gneisses, granitoid rocks, metasedimentary rocks, and the Fraser complex. This is the first metamorphic and tectonic episode recognized in the Mount Barren metasedimentary rocks (Thom and others, 1981), and appears to be associated with tectonic interleaving, at a deep crustal level, of stratigraphic units within the Fraser Complex and Mount Barren Group.

(b) A high-grade (granulite facies) metamorphic and tectonic episode 1.3-1.2 Ga ago associated with the emplacement of porphyritic granite sheets, and the folding of foliation and layering of the Fraser Complex.

(c) An episode of granite intrusion, low-grade metamorphism, and high-level deformation about 1.1 Ga ago.

The name Fraser Complex was proposed by Doepel (1973) for the belt of pyroxene granulites, about 32 km wide and over 185 km long, which extends from the Fraser Range, east of Norseman, to Zanthus (Fig. 1). The outcrop of these rocks is shown on the 1:250 000 maps, Zanthus (Doepel and Lowry, 1970a), Balladonia (Doepel and Lowry, 1970b), Norseman (Doepel, 1973), and Widgiemooltha (Sofoulis, 1966). The northeastern extent of these rocks, which is mainly below younger cover, was outlined by Bunting and others (1976). The Fraser Complex, defined by Doepel (1973), consists of basic pyroxene granulites which contain veins and bands of acid granulite.

Doepel (1973) and Wilson (1969a, 1969b) recognized "remnants of gabbro" within the pyroxene granulites. Wilson (1969b) mapped some of these gabbro remnants as a flat-lying sheet, which he called the "East Fraser Gabbro" and considered to be intrusive into the more widespread pyroxene granulites. He described the petrology of the "East Fraser Gabbro" from outcrops along the Eyre Highway; he also observed that the marginal zones of this gabbro were metamorphosed to granulite facies, and speculated that some of the homogeneous pyroxene

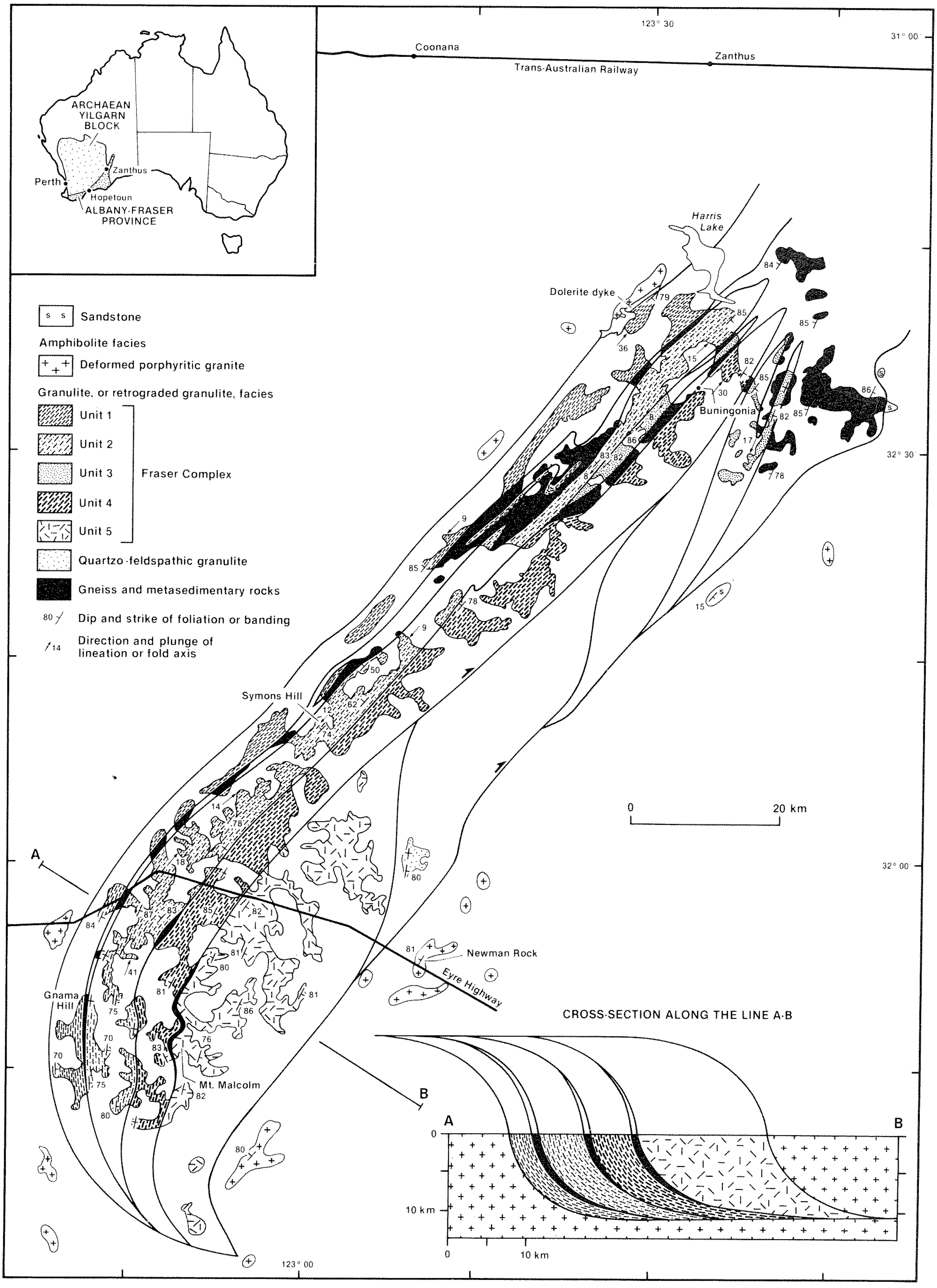


Figure 1. Simplified geological outcrop map and schematic cross-section of the Fraser Complex.

granulites could represent metamorphic equivalents of similar intrusive gabbroic rocks. However, he considered that most of the granulites were derived from metamorphosed volcanic rocks, a view supported by Bunting and others (1976), but contested by Doepel (1973). Wilson (1969b) interpreted pyroxenite layers as the "decayed tops of basalt flows"; concentric jointing as pillow-lava structures; ellipsoids of quartz and feldspar as relic amygdules; and thin quartzo-feldspathic layers as either sandy intercalations in a mafic volcanic pile, acid volcanic rocks, minor intrusions, or metasomatized basic rocks.

Newmont Pty Ltd explored the Fraser Complex for nickel between 1965-70 but no significant mineral deposits were found (Tyrwhitt and Orridge, 1975). The work included an aeromagnetic survey, geological mapping, regional soil sampling, and shallow reconnaissance drilling.

The following account and map (Fig. 1) are based on 21 days of reconnaissance mapping of the Fraser Complex during 1982-83. The Fraser Complex is here redefined to include only the metamorphosed basic igneous rocks, and to exclude intercalated quartzo-feldspathic gneisses, metasedimentary rocks, and deformed porphyritic granites and pegmatites, which, together with the basic igneous rocks, are part of the Albany-Fraser province (Doepel, 1975).

FRASER COMPLEX

The Fraser Complex outcrops in a belt 30 km wide and 200 km long, and can be traced as large positive gravity and magnetic anomalies for a further 250 km to the northeast. It lies within, and is parallel to, the regional trend of the Albany-Fraser Province (Bunting and others, 1976, Fig. 63). The structure is superficially simple: The complex, and all layers and foliations within it, strike northeast and are vertical or dip steeply to the northwest or southeast. Lineations and fold axes plunge northeast or southwest.

The Fraser Complex can be divided into five major tectonostratigraphic units (Fig. 1), which are described below from northwest to southeast.

Unit 1

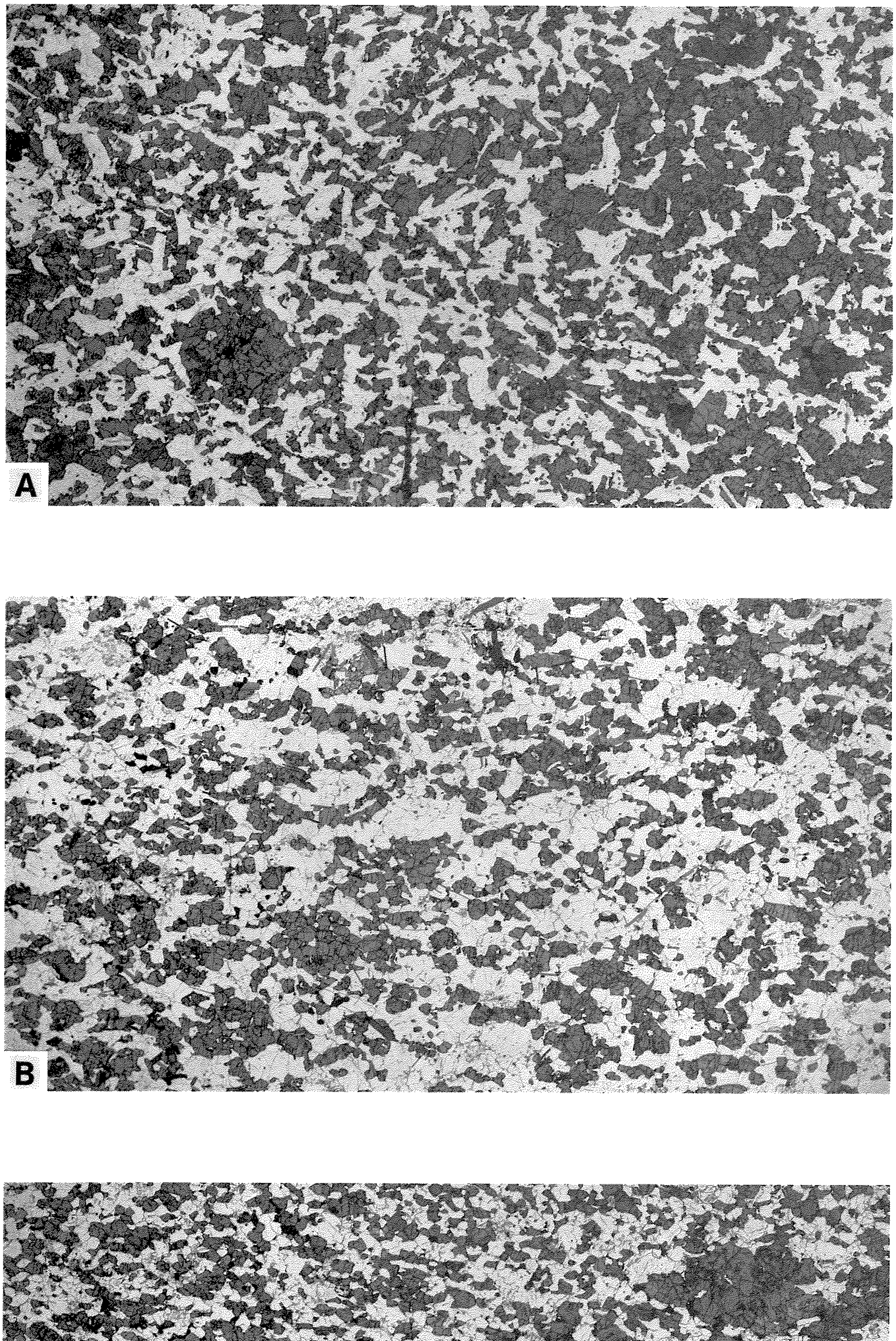
Unit 1 forms the western part of the Fraser Complex and is a steeply east-dipping sheet between 3 and 6 km thick (Fig. 1). It consists mainly of garnet amphibolite (interpreted as garnet metagabbro) and thin layers of metamorphosed ultramafic rocks, melanogabbro, and anorthosite. All these rocks are strongly deformed and show macroscopic foliation and (locally) minor folds, but they generally have coarse-grained, post-tectonic metamorphic textures. Most of the garnet amphibolites consist of plagioclase, green hornblende, garnet, and epidote. Relic igneous textures are only locally preserved, but show that the amphibolite is derived from metagabbro (probably olivine, pyroxene, plagioclase cumulate). The leucogabbro and anorthosite layers consist mainly of plagioclase, clinopyroxene, and orthopyroxene (with or without garnet), which form post-tectonic, granoblastic textures and may represent mainly plagioclase cumulate igneous layers. Ultramafic layers consist mainly of metamorphic-textured orthopyroxene and green spinel, and may be derived from orthopyroxene(-olivine) cululates. Newmont Pty Ltd discovered a sheet of pyroxenite and serpentinized dunite (2 500 m long and up to 250 m wide) by drilling within this unit (Tyrwhitt and Orridge, 1975).

Unit 2

Unit 2 forms a sub-vertical sheet between 2 and 6 km thick, east of unit 1, and mainly comprises basic pyroxene granulite—the rock type previously mapped as forming most of the Fraser Complex. It is generally medium grained, has a granoblastic texture, and contains about 60% plagioclase, 20% orthopyroxene, 15% clinopyroxene, 3% biotite, and 2% magnetite. Some of the minerals are elongate and are aligned parallel to the macroscopic foliation. Relic igneous texture is locally preserved and shows that most of these rocks are derived from gabbros or norites. Many outcrops show relic igneous layering, and two kinds occur: compositional layering ranging from metamorphosed melanogabbro to gabbro and leucogabbro; and size-controlled layering marked by variations in the grain sizes of relic cumulus pyroxenes. No relic, size- or mineral-graded layering was observed; each layer is generally uniform and has symmetrical boundaries, which may be either gradational or sharp. The rocks are generally strongly deformed, and relic igneous layering forms tight or isoclinal folds (such as on Symons Hill). The main macroscopic fabric is axial planar to these folds and is sub-parallel to the long limbs of the folds. Most relic igneous layering is therefore locally transposed into the main tectonic fabric.

Unit 3

Unit 3 occurs to the south and southeast of Harris Lake as a tightly folded, steeply dipping slab between 1 and 2 km thick, (Fig. 1). It is enclosed by quartzite and gneiss except in the southwest where it appears to be in contact with unit 2. It consists mainly of metamorphosed leucogabbro, layers of anorthosite, and minor layers of gabbro and melanogabbro. The contacts between the layers are either sharp or gradational, but no asymmetric graded layering was observed. Most rocks are strongly deformed and show macroscopic foliation parallel to compositional layering; but recrystallization outlasted deformation, and the rocks generally show medium-grained equigranular metamorphic textures.



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Unit 4

Unit 4 occurs as a sub-vertical sheet between 5 and 6 km thick. Along most of its outcrop, it lies adjacent to, or is separated by a thin layer of quartzite from, unit 2 to the west (Fig. 1). South of Harris Lake, it is separated from unit 2 by unit 3 and a thick layer of quartzite. The main rock type and features of unit 4 are similar to those of unit 2.

Unit 5

Unit 5 forms the eastern part of the Fraser Complex and outcrops as a steeply east-dipping sheet up to 16 km thick. Its eastern margin is not exposed. It consists mainly of gabbro and metagabbro with a little-deformed relic igneous texture. Igneous minerals are widely preserved and consist of cumulus orthopyroxene, plagioclase, green spinel, and clinopyroxene; and intercumulus plagioclase. Olivine occurs as remnants within cumulus orthopyroxene, and green spinel also occurs as an exsolution product within orthopyroxene. Biotite generally occurs as an alteration product of orthopyroxene. In many cases, the igneous minerals are clouded. The "eucrite" described by Wilson (1969b) is part of this unit; but it is mainly an orthopyroxene cumulate with intercumulus plagioclase and not a typical rock type.

Gradational sequences can locally be seen between these rocks and strongly deformed metagabbros, similar to those which comprise most of unit 2, in which igneous textures are extensively obliterated (Figs 2A, B, C). These local zones of strong deformation are parallel to the strike of the whole unit and the main foliation of the other units; and some of them enclose lenticular bodies of little-deformed or undeformed metagabbro.

Geochemistry

Thirty-two whole rock samples were analyzed for major and trace elements by XRF to determine the composition of the main rock types and any igneous differentiation trends which might provide evidence of the original "way-up" of the major stratigraphic units. Representative analyses are given in Table 1, and igneous differentiation trends of stratigraphic units are outlined on an AFM diagram (Fig. 3). The whole suite of analyzed samples shows a clearly defined trend towards iron enrichment, which is broadly similar to that shown by other major layered intrusions that crystallized from basaltic magma (Fig. 3).

The rocks of unit 5 plot as a group and have generally lower FeO/MgO ratios than those from other units, and they therefore appear to be derived from a less evolved magma. If the five main stratigraphic units represent parts of a single-layered intrusion derived from one body of magma, then unit 5 would be interpreted as the lowest structural unit. Rocks from unit 3 plot in a group and show the highest FeO/MgO ratios; these rocks appear, therefore, to be derived from the most evolved magma. Rocks from units 1, 2 and 4 plot as a group with an intermediate position between, and partly overlapping with, units 3 and 5.

The different tectonostratigraphic units could have been derived from different magmas, but if all five units are assumed to be the crystallization products of a single body of magma, then the FeO/MgO ratios suggest that the original order of crystallization and deposition was firstly unit 5, then 4, units 1 and 2, and lastly unit 3.

ASSOCIATED ROCKS

Gneiss

Gneiss occurs interlayered with quartzite and metamorphosed leucogabbro in the northeastern part of the Fraser Complex (Fig. 1). It shows banding defined by variations in concentrations of mafic minerals (mainly biotite) and by alternations of quartzofeldspathic and amphibolite layers. It is strongly deformed, fine to medium grained, and shows a greater variety of rock types and a more complicated geological history than the recrystallized granites described later.

Metasedimentary rocks

Metasedimentary rocks are interlayered with metamorphosed basic igneous rocks within the Fraser Complex (Fig. 1). They occur as thin layers of great

Figure 2. Progressive stages in the deformation and recrystallization of gabbro of unit 5 on Mount Malcolm. The sections shown are 25 mm wide.

A. Undeformed, partly recrystallized gabbro with laths of igneous plagioclase (An_{75}) set in large poikilitic orthopyroxene and clinopyroxene crystals. Olivine is partly altered to iddingsite. (GSWA sample 74644).

B. Weakly deformed, mainly recrystallized gabbro with relic plagioclase laths recrystallized to granular mosaics (An_{65}), and mainly metamorphic orthopyroxene, clinopyroxene and biotite. (GSWA sample 74641).

C. Strongly deformed and completely recrystallized gabbro with granoblastic polygonal texture of plagioclase (An_{55}), orthopyroxene and clinopyroxene. The upper portion is less deformed than the lower portion and shows aggregates of granoblastic plagioclase defining relic igneous laths, tectonically rotated into parallelism (GSWA sample 74643).

TABLE 1. MODAL AND CHEMICAL ANALYSES OF METAGABBRO SAMPLES FROM THE FRASER COMPLEX

GSWA Sample No.	Unit 1 74626	Unit 2 74615	Unit 3 74704	Unit 4 74665	Unit 5 74652
		Minerals (%)			
K-feldspar	2	7	2	2	
Plagioclase	60	58	62	62	65
Olivine					3
Orthopyroxene	19	17	17	17	12
Clinopyroxene	16	13	17	17	11
Hornblende	1				4
Biotite		1			3
Opaques	2	4	2	2	2
		Major oxides (wt%)			
SiO_2	50.09	50.00	53.77	50.95	49.21
TiO_2	1.35	1.50	1.63	1.04	0.99
Al_2O_3	15.75	15.83	14.00	16.16	17.72
Fe_2O_3	1.41	1.63	2.05	1.83	1.37
FeO	10.00	9.34	10.30	8.67	8.59
MnO	0.30	0.25	0.28	0.21	0.18
MgO	7.17	7.68	4.58	7.78	8.78
CaO	9.54	9.67	7.95	9.87	9.86
Na_2O	2.45	2.37	2.71	2.49	2.40
K_2O	0.53	0.69	1.35	0.39	0.46
P_2O_5	0.16	0.30	0.40	0.11	0.10
H_2O	0.60	0.59	0.49	0.46	0.59
H_2O^+	0.23	0.16	0.12	0.16	0.14
CO_2	0.07	0.05	0.03	0.18	0.15
Total	**99.65**	**100.06**	**99.66**	**100.16**	**100.53**
		Trace elements (ppm)			
Li	17	18	16	10	5
Rb	11	10	33	5	12
Sr	182	232	158	192	181
Ba	157	299	508	204	199
Zr	84	120	155	69	84
La	26	39	27	10	15
Ce	42	61	85	25	27
Sc	38	32	34	37	30
V	211	187	185	207	181
Cr	285	271	48	297	254
Co	55	65	55	75	70
Ni	40	85	20	75	150
Cu	100	120	110	140	130
Zn	94	105	155	96	81
Ga	15	14	17	15	13

lateral extent, and are especially prominent between the five major units of the Fraser Complex. They also form a thicker sequence to the east and southeast of Harris Lake. Most of these metasedimentary rocks are coarse-grained quartzites, with minor amounts of pelitic and semi-pelitic rocks comprising quartz, sillimanite, mica, feldspar, garnet, and amphibole, and thinly banded quartz-magnetite rocks. They are strongly deformed and show mainly post-tectonic mineral assemblages of granulite or amphibolite facies.

Recrystallized granite and pegmatite

Recrystallized granite and pegmatite occur throughout the Fraser Complex as thin sheets parallel or sub-parallel to the main foliation of the complex. Most granites are coarse grained, porphyritic, and contain hypersthene and biotite. Some granites and most pegmatites contain garnet, and some pegmatites are zoned and have aplitic margins.

The granite and pegmatite cut across relic igneous layering of the Fraser Complex and post-date an episode of strong deformation of the Fraser Complex, metasedimentary rocks, and gneisses. They were subsequently strongly deformed together with these rocks and now possess the same main tectonic fabrics as the Fraser Complex. The zoned margins of some pegmatites and the discordant contacts of some granites suggest that these granitic rocks were intruded as sheets into the other rocks before or during the deformation which formed the main tectonic fabrics of the Fraser Complex.

Quartzo-feldspathic granulite

A fine-grained, uniform, hypersthene-bearing quartzo-feldspathic granulite occurs to the southeast of the Fraser Complex (Fig. 1). The rock shows a mineral lineation and a pronounced foliation parallel to the main fabrics of the Fraser Complex. The origin of the rock is not clear, but it may have been a granitoid plutonic rock.

Sandstone

Sandstone, which is undeformed and not obviously metamorphosed, occurs to the northeast of the Fraser Complex (Fig. 1). It shows a greater variety of composition and grain size than the deformed and

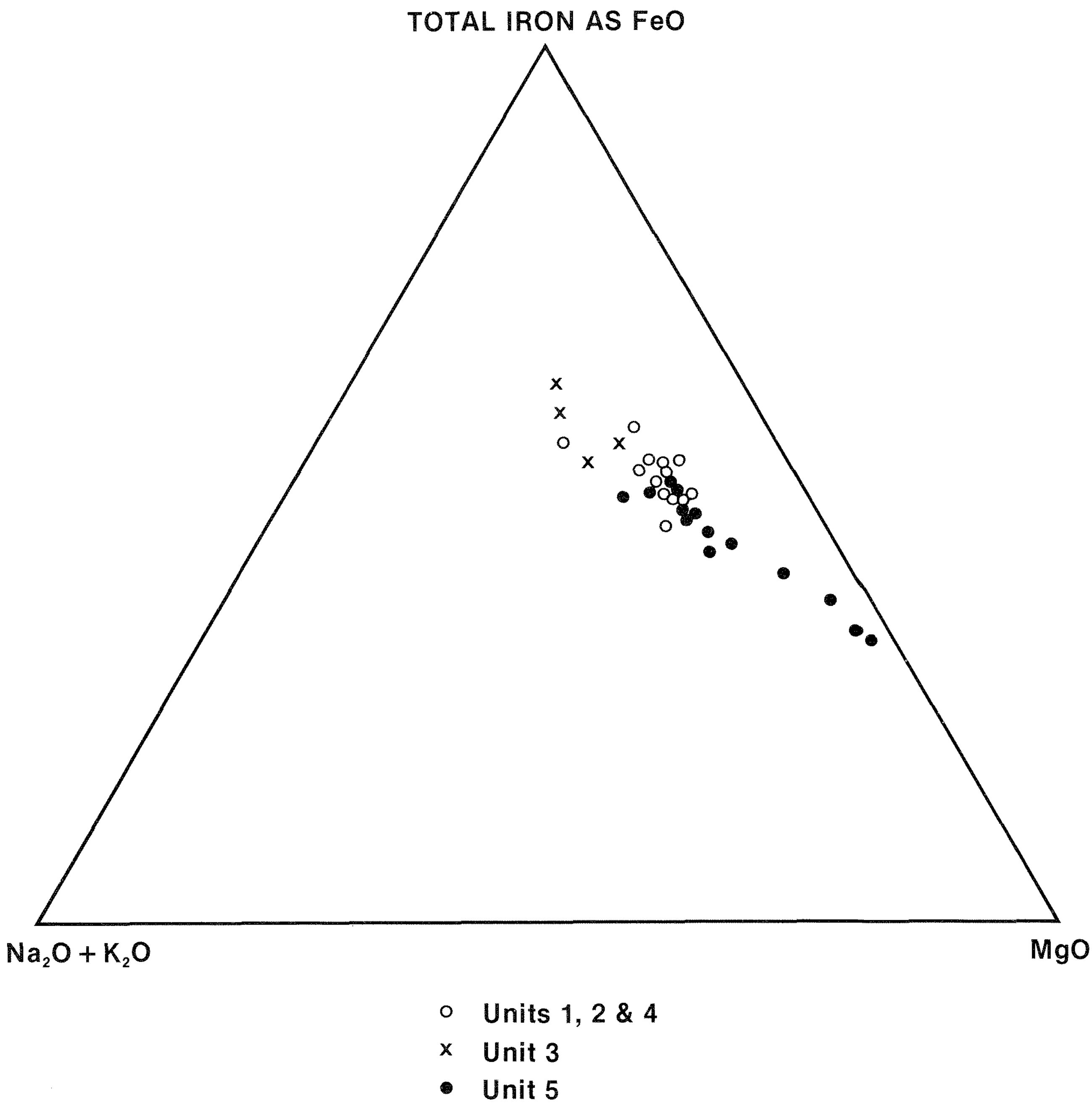

Figure 3. A-F-M diagram showing a linear trend towards iron enrichment.

metamorphosed quartzite (which is mainly orthoquartzite), and it generally contains feldspar and is arkosic. It appears to post-date the main deformation and metamorphism of the Fraser Complex.

TECTONIZED BOUNDARIES OF THE FRASER COMPLEX

The boundaries of the Fraser Complex are concordant with the main regional foliations and are zones of intense deformation.

The northwest margin of the Fraser Complex was only seen exposed to the southwest of Harris Lake (Fig. 1). There, rocks of the Fraser Complex occur as lenses and pods of gabbro in flaggy quartzo-feldspathic gneiss and as thin layers of amphibolite tectonically interleaved with quartzo-feldspathic rocks forming amphibolite-banded gneiss or schist. All the rocks are intensely deformed in a zone 2 km wide; they are finely banded, fine-grained, schistose or mylonitic, and have been recrystallized in the epidote-amphibolite or garnet-amphibolite facies. They show complex deformation, and the schistosity is locally folded into small folds which plunge at moderate angles to the northeast.

These rocks are cut by an undeformed, vertical dolerite dyke, 500 m wide (Fig. 1), which lies along strike from mapped outcrops of the Binneringie dyke on the Widgiemooltha sheet to the southwest (Sofoulis, 1966). The dyke cuts—and encloses xenoliths of—strongly deformed flaggy gneiss, amphibolite, and augen granite. It is cut by sheets of muscovite-bearing granite, pegmatite, and aplite, which show a lineation plunging moderately to the northeast, similar in orientation to late lineations and fold axes in the flaggy gneiss. To the northwest, the flaggy gneiss is suceeded by strongly deformed porphyritic granite with a pronounced foliation parallel to that of the flaggy gneiss, then by less-deformed porphyritic granite and coarse, even-grained, granite.

The westernmost outcrops of the Fraser Complex along the Eyre Highway also show intense deformation of strips of garnet amphibolite in quartzo-feldspathic gneiss, and the intensity of this deformation may reflect the proximity of these outcrops to the northwestern margin of the Fraser Complex. Much of the quartzo-feldspathic gneiss at this locality appears to be derived from rocks intrusive into the garnet amphibolite, which occurs as agmatite. The rocks were strongly deformed together and are locally fine grained and mylonitic. The deformation was associated with retrogression from granulite to garnet-amphibolite facies, and recrystallization generally outlasted the deformation.

The northwestern margin of the Fraser Complex was thus a zone of intense ductile deformation and retrogression from granulite to amphibolite facies, but the name Fraser Fault introduced for this boundary by Wilson (1958) is misleading. Most of the deformation was ductile and occurred at a deep crustal level.

The southeastern margin of the Fraser Complex is not exposed. The fine-grained quartzo-feldspathic granulites to the east of unit 5 show similar tectonic and metamorphic fabrics to those in the Fraser Complex and appear to have shared the same episode of deformation and granulite-facies metamorphism. However, in contrast, the adjacent rocks further to the southeast, which are best exposed at Newman Rock (Fig. 1), do not appear to have been metamorphosed to granulite facies. They consist of metasedimentary rocks intruded by a moderately deformed porphyritic granite, all metamorphosed to amphibolite facies. Xenoliths of metasedimentary rocks within the granite are aligned parallel to a weakly developed foliation at a high angle to the trend of the Fraser Complex. This foliation is cut by sinistral ductile shear zones in which mylonites formed in amphibolite facies parallel to the main (granulite facies) foliation of the Fraser Complex. Therefore all the rocks appear to have shared the same episode of deformation but at different metamorphic grades. The porphyritic granite at Newman Rock does not appear to have been metamorphosed above amphibolite facies, and yet its oldest tectonic fabrics pre-date the main foliation and associated granulite—facies metamorphism of the Fraser Complex. There may therefore be a major tectonic dislocation between the rocks in the vicinity of Newman Rock and the quartzo-feldspathic granulites to the northwest.

DISCUSSION AND CONCLUSIONS

The igneous composition of the Fraser Complex; the widespread presentation of relic igneous textures and, in unit 5, of igneous minerals with cumulus textures; and the layering of metamorphosed anorthosite, leucogabbro, gabbro, melanogabbro, and ultramafic rocks indicate that the Fraser Complex is part of a major layered basic intrusion.

The absence of basic volcanic rocks and sheeted-dyke complexes suggests that the intrusion was not the lower part of a slice of oceanic crust, unless it was detached from such crust.

The intimate association of gneiss and metasedimentary rocks suggests that the Fraser Complex was either intruded into, or tectonically interleaved with sialic crust

The great extent of the relatively very thin layers of metasedimentary rocks and their occurrence only between, and not within, the major tectonostratigraphic units of the Fraser Complex, suggest that the metasedimentary rocks are not thin rafts of host rocks spalled off during the intrusion of the Fraser Complex (unless the Complex was intruded as a number of sill-like bodies). Rather, the relative size, shape, and position of the metasedimentary layers, combined with the locally intense heterogeneous deformation concentrated along these layers and the immediately adjacent igneous rocks suggest that the Fraser Complex was disrupted by sub-horizontal movements, and was tectonically interleaved with metasedimentary rocks and associated quartzo-feldspathic gneiss by thrusting. The total apparent thickness of the Fraser Complex is unusually great, and so zones of dislocation may also occur within the major units, by which originally thinner units may be stacked as thrust slices.

The ductile nature of the deformation along the boundaries of rock units suggests that tectonic interleaving occurred at depth in the crust (Fig. 4). At the surface, these thrust contacts are now steeply dipping, but the interpretation of gravity data by Everingham (1964) that the pyroxene granulites extend to a depth of only 10 km, suggests that at depth the thrusts are listric (Fig. 1, Section A-B). The overall structure of the Fraser Complex and associated rocks shown by the map (Fig. 1) does not support its interpretation by Gee (1979) as a large synform.

The lenticular bodies of ultramafic rocks and associated norites discovered by Newmont Pty Ltd within and along the southeastern margin of unit 1

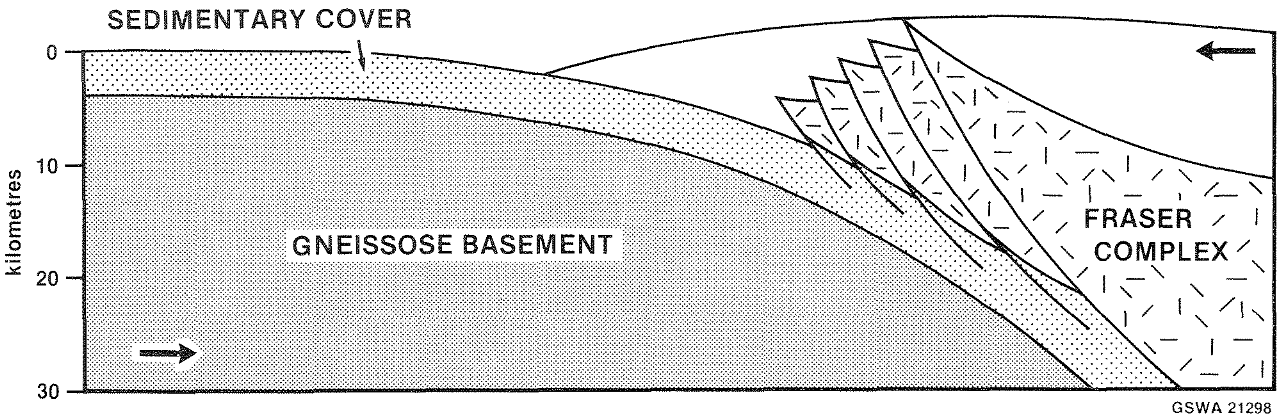

Figure 4. Diagrammatic section showing a mechanism for the tectonic interleaving of the Fraser Complex with metasedimentary rocks and gneisses (?1.8-1.6 Ga ago).

could be tectonically emplaced slivers rather than *in situ* intrusions or cumulate layers. The mapped example presented by Tyrhwitt and Orridge (1975, Fig. 2) shows that these ultramafic bodies and associated norite occur in a complex zone of interleaved quartzites and basic pyroxene granulites.

The Fraser Complex and interleaved gneiss and metasedimentary rocks were subsequently intruded by sheets of porphyritic granite and pegmatite and were all strongly deformed together. They developed tectonic fabrics in granulite facies which indicate that the deformation occurred at a deep crustal level. Metamorphism outlasted the deformation, but post-tectonic mineral assemblages are also mainly in granulite facies.

The northwestern margin of the Fraser Complex continued to be a zone of tectonic activity; intense deformation in this zone was accompanied by retrogression to amphibolite facies and led to the formation of flaggy gneiss, schist, and mylonite, probably associated with movement of these rocks to a higher crustal level. The adjacent, older, granite complexes both to the northwest, west of Harris Lake, and to the southeast, at Newman Rock, do not appear to have been metamorphosed above granulite facies. This suggests that the Fraser Complex, together with the interleaved gneiss, metasedimentary rocks, and quartzo-feldspathic granulite, was emplaced as a large, composite, tectonic slice from a deep crustal level, where granulite assemblages were stable, into amphibolite facies rocks at a higher crustal level.

The exposed Fraser Complex may represent only part of a major layered intrusion. It has been severely disrupted and distorted by deformation, and its original location and thickness are unknown. The maximum age of the Fraser Complex is also unknown. A Rb-Sr whole-rock isochron of 1 328 ± 12 Ma determined by Arriens and Lambert (1969) from granulite-facies rocks of the Fraser Range is mainly influenced by granitoid rocks which are intrusive into the basic igneous rocks of the Fraser Complex.

Although the outcrops of the Fraser Complex may represent only part of the layered sequence of a major intrusion, they are an important suite of rocks. They are a major component of the Albany-Fraser Province, and the interpretation of their geological history is therefore of considerable importance in understanding the tectonic evolution of this mobile belt. In additon, the Fraser Complex presents a sizeable exploration target for chromite and platinum.

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