Rec'd Jan 9/20

801453
MANEX
THOEN MTN.

T1.

Hand specimen

This is a greenish grey feldspar porphyry presumably of andesitic composition. The groundmass is extremely fine grained. Pyrite is scattered through the rock and limonite lines fractures and cracks.

Thin section

Mode

Altered feldspar phenocrysts	23%
Quartzo-feldspathic groundmass (v.f.g.)	60%
Chlorite in groundmass	10%
Opaque minerals	2%
Stilbite ?	2%
Epidote	2%
Biotite	Tr
Hornblende	1%

Texture

The rock has an extremely fine grained groundmass of altered (sericitized and saussuritzed) feldspar and fresh quartz in which subhedral, equant phenocrysts of strongly sericitized plagioclase (and K feldspar ?) occur. The phenocrysts are in most cases distinguishable only by their relatively unaltered cores. Chlorite occurs in blebs and aggregates of tiny flakes throughout the altered groundmass as do the opaque minerals. Stilbite? is a cavity filling and occurs as subhedral bladed crystals. Hornblende and biotite, both pleochroic in browns, are rare and relatively fresh. Epidote is an alteration product of the feldspars.

Name: Amygdaloidal intermediate feldspar porphyry (Andesitic composition ?)

Origin: This rock is of volcanic or subvolcanic origin and is strongly saussuritized.

T2

Hand specimen

This is a fine grained medium grey hornfelsed sandstone with scattered pyrite throughout. Films of finely divided molybdenite are evident on broken surfaces.

Thin section

Mode

Biotite	8%
Zircon	Tr
Quartz	54%
Opaque minerals	2%
Apatite	1%
Altered rock fragments	15%
Altered fragments of feldspar	20%

Texture

The rock is a fine grained arenite ranging in grain size from 0.5 to 0.02 mm with grains of 0.05 mm predominant. Most fragments are of monocrystalline unstrained quartz with scattered sharp boundaries.. Rock fragments are altered to a variety of clay and mica minerals and their original nature is difficult to ascertain. Feldspar fragments, both orthoclase and plagioclase, are altered slightly to kaolin minerals and are generally the coarsest grains in the rock. One or two grains of detrital zircon are scattered throughout. Apatite is apparently hydrothermally introduced. Biotite is in small flakes, pleochroic in browns, and is grown as a replacement of parts of most of the rock fragments.

Name: Thermally metamorphosed (hornfelsed ?) immature arkosic arenite.

Origin: This is a chemically and texturally immature fine grained arenite that has been thermally metamorphosed. Its constituent fragments are of sedimentary and volcanic derivation.

Handspecimen

The rock is a fine grained hornfelsed sandstone with pyrite and chalcopyrite scattered throughout.

Thin section

Mode

Biotite	10%
Quartz	37%
Chlorite	2%
Opaques	1%
Lithic material (f.g. clay minerals etc.)	50%

Texture

This specimen is a lithic arenite made up of rock and quartz fragments of various sizes (from 0.5 mm to 0.01 mm). Quartz grains are monocrystalline and unstrained; they have sharp boundaries and most coarser grains are fairly well rounded though of low sphericity. Biotite is a metamorphic mineral that has grown at the expense of prexisting clay and other minerals in the fine grained fraction. It now occurs as tiny flakes scattered throughout the rock. The rock is cut by narrow regular veinlets of regenerated quartz.

Name: Thermally metamorphosed greywacke or lithic arenite.

Origin: This is a poorly sorted chemically and texturally immature sandstone derived from a sedimentary and volcanic source area. The rock is metamorphosed (thermally ?) so that some lithic fragments are now replaced partially by newly formed biotite.

Rec'd Jan. 9/70

T3

Hand specimen ~~Gray~~

Equigranular biotite hornblende quartz monzonite or quartz diorite.

Thin section

Mode

Plagioclase	40%
K feldspar	20%
Quartz	15%
Biotite	5%
Hornblende	8%
Apatite	1%
Opaque minerals	1%

Texture

This is a medium grained, equigranular hypidiomorphic rock. Grain size is about 1.2 mm on the average. Plagioclase (An_{38}) forms large subhedral thick tabular crystals that are fresh and zoned and beautifully twinned according to the Carlsbad-Albite law. Orthoclase forms equant subhedral crystals commonly slightly sericitized. Hornblende, pleochroic in green colours is fresh and forms subhedral, short prismatic grains commonly intergrown with biotite. Biotite is pleochroic in brown and quite fresh; some biotite replaces hornblende. Quartz occurs interstitially as anhedral ~~monocrystals in~~ microcrystalline patches. Apatite occurs as euhedral, hexagonal prismatic grains commonly associated with biotite. Opaque minerals are scattered throughout.

Name: Mineral proportions indicate the rock is gradational between ~~trace~~ true granite and quartz monzonite, but the plagioclase is more characteristic of the latter. Equigranular biotite hornblende quartz monzonite.

Alteration: The rock is extremely fresh and unaltered.