

PRELIMINARY SUMMARY REPORT OF GEOLOGY OF
SULPHURETS-MITCHELL CREEK RIDGE

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The Mitchell Creek-Sulphurets Creek property is structurally complex and consists of a number of thrust faults placing units of different lithology, alteration and mineralization in juxtaposition. The most prominent structure is the Sulphurets Thrust Fault, which carries a sill complex over hydrothermally altered sediments.

The upper thrust unit consists of a series of transgressive sills of monzonitic/syenitic aspect which are intrusive into a sequence of volcanics faulted against arenaceous sediments. The volcanic rocks are predominantly andesitic in character with subordinate dacitic flows, agglomerates and agglomeratic tuffs which are more frequent in the upper part of the volcanic unit. Metasomatic phenomena, particularly potash metasomatism, are widespread but minor, being prominent only along shears that are present in the unit and which are related to the Sulphurets Fault.

The Sulphurets Fault is a zone of movement rather than a discrete discontinuity and comprises a complex interdigitation of andesitic and monzonitic units with siliceous replacement units that are characteristic of the hydrothermal assemblages below the fault. In the movement zone, there is a strong, closely spaced cleavage developed.

By far the largest unit in the property is the regional hydrothermally altered assemblage which exhibits marked but regular variation in alteration type. The rock units are not clearly recognizable in many cases but, where found, comprise siltstones and greywackes with minor pre-alteration siliceous intrusives. There is considerable structural complexity in this unit. A large boss of a fine grained intrusive of syenitic aspect with associated satellitic dykes is cut by a silicified shear zone and is itself cut by a subsidiary thrust which carries part of this intrusive over hydrothermal assemblages. In addition, a wedge of agglomerates, flows and sediments is faulted into the hydrothermal assemblages and only altered along thin arcuate shears.

The regional alteration alluded to above, consists of a sericitic assemblage that is crudely zoned around a dome or core of intense silicification, centred in the vicinity of D. D. H. #68-5 and 6. This comprises a core of aphanitic, cherty material that passes outwards through a dense stockwork of quartz veins into a sparsely veined zone. The sericitic assemblages form a crude envelope to this siliceous dome, despite complications produced by faulting associated with the steepening of a westerly dipping thrust fault. The cleavage in the schists defines a fold structure plunging steeply to the northwest.

The sericitic alteration does not appear, on the scale of mapping, to be related to known intrusives and transects lithological boundaries. Away from the

sericitic alteration there is pervasive silicification but only subordinate chlorite and sericite. Pyrite is ubiquitous in this unit and will be referred to in a later section.

The third major structural unit present is one comprising sediments and markedly porphyritic intrusives. It is faulted against the hydrothermally altered assemblages but has itself escaped significant alteration except in the vicinity of the fault zone. The sediments are chiefly siltstones, sandy siltstones and argillites that are folded into inclined asymmetric folds. The porphyritic intrusives are varied in character and consist of an extensive sill of orthodase porphyry cut by later hornblende porphyry.

The three units described have different structural and alteration types. The upper thrust sheet is cut by a number of faults, interpreted as splays associated with the Sulphurets Fault. Potash metasomatism is related to some of these faults which also possess subordinate quartz-pyrite alteration. There is a low grade regional, isochemical, metamorphism present in this sheet.

Within the Sulphurets Fault zone, there is an interdigitation of lithological and alteration types of both the overlying thrust block and the underlying hydrothermal association with a pervasive and multi-directional fracture and cleavage pattern developed.

The hydrothermal assemblage is characterized by the inconsistent development of fractures and cleavage in the silicified replacement units. The exception to this is the sericitic assemblages where there is a pervasive set of cleavages present and some cross fracturing related to folding.

The third tectonic unit shows evidence of fracturing associated with fault patterns but there is little evidence of widespread deformation and metamorphism.

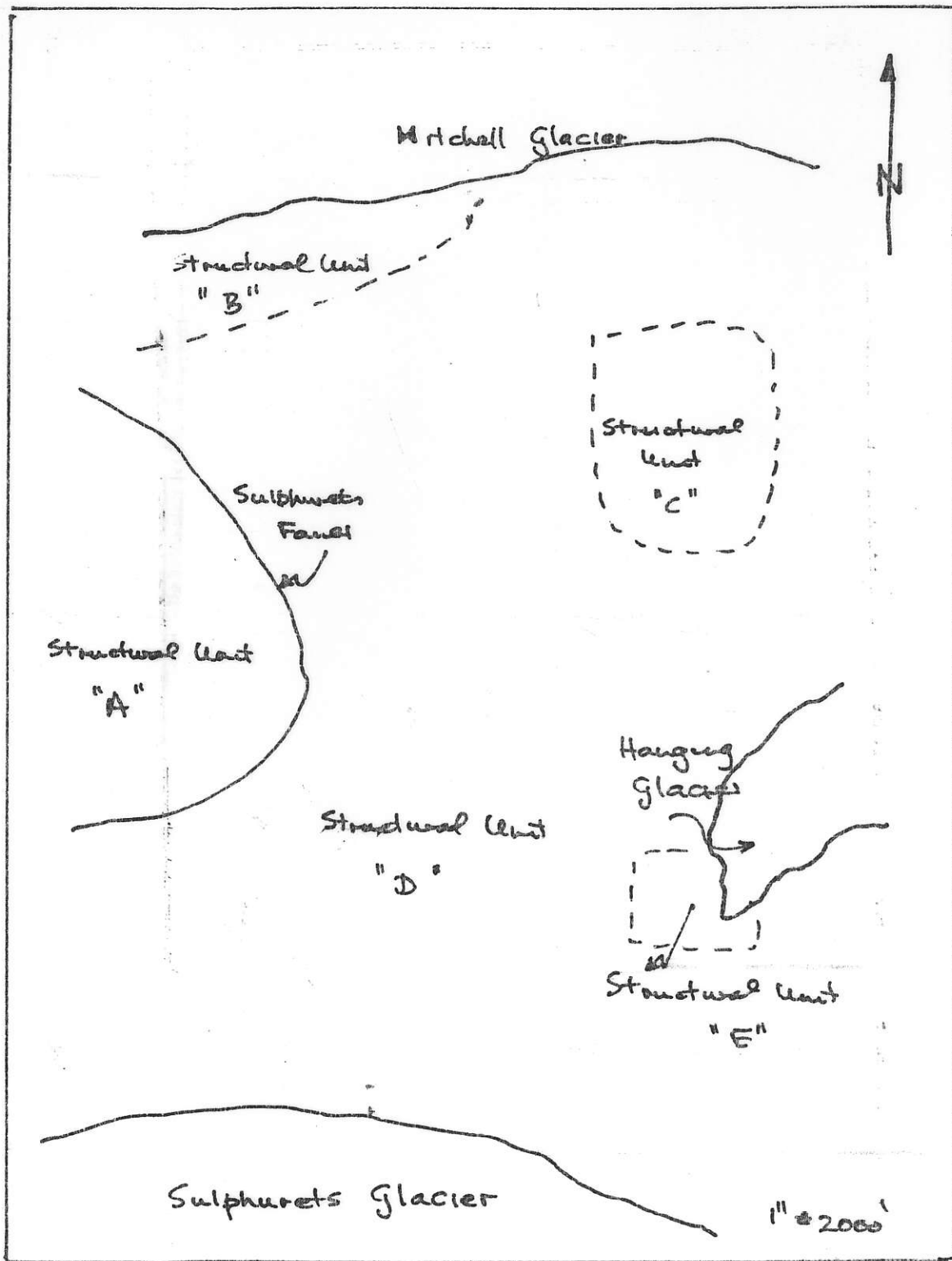
Sulphide mineralization is widespread in the property but over much of the area, it is barren of valuable metals. The upper thrust block carries low, but widespread amounts of copper mineralization averaging about 1/2% to 1% Cu. The area of mineralization is spatially associated with the monzonitic sills and shear zones transecting the sills, hybridised sills and andesites. The depth of the zone is limited by the Sulphurets Fault but the mineralization is sufficiently widespread to perhaps warrant further examination.

The Sulphurets Fault Zone which was drilled in part in 1962, 1968, is characterized by the same type of mineralization as the upper thrust block, though there may be some enrichment from the interdigitation of sills and replacement rocks. It is suggested that this enrichment occurred at elevated temperatures and pressures during the thrust movements.

Molybdenum mineralization rarely occurs in spatial association with copper mineralization. There is, however, a significant MoS_2 showing in the Ross claims. The molybdenite occurs in fractures and thin disseminations in the sericite schist "envelope" around a silicification "dome" or "core". The results of drilling and field mapping appear to indicate that though MoS_2 is widespread, it forms zones

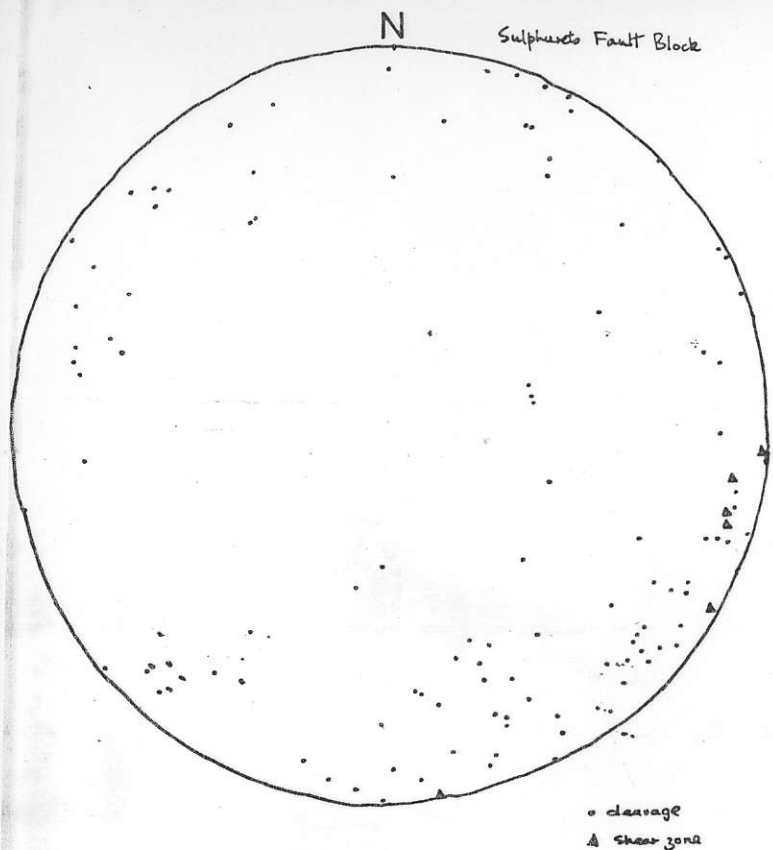
that do not possess significant length or breadth. The extensive, and spectacular pyritic zones (averaging 3% to 5% pyrite) in the hydrothermal zone that carry trace copper mineralization are of no economic significance. They are considered to be due to "sulphurization" of a regional unit in which iron was re-arranged and fixed with sulphur.

Thin fractures occasionally carry appreciable amounts of copper mineralization but are limited in extent and width. A zone of baryte-calcite-quartz veins found in the eastern part of the property is about 400' wide. The vein system is related to cross flexing of a westerly plunging asymmetric fold. Wide veins with significant amounts of mineralization are lacking, although previous investigators reported good gold/silver values over narrow widths.



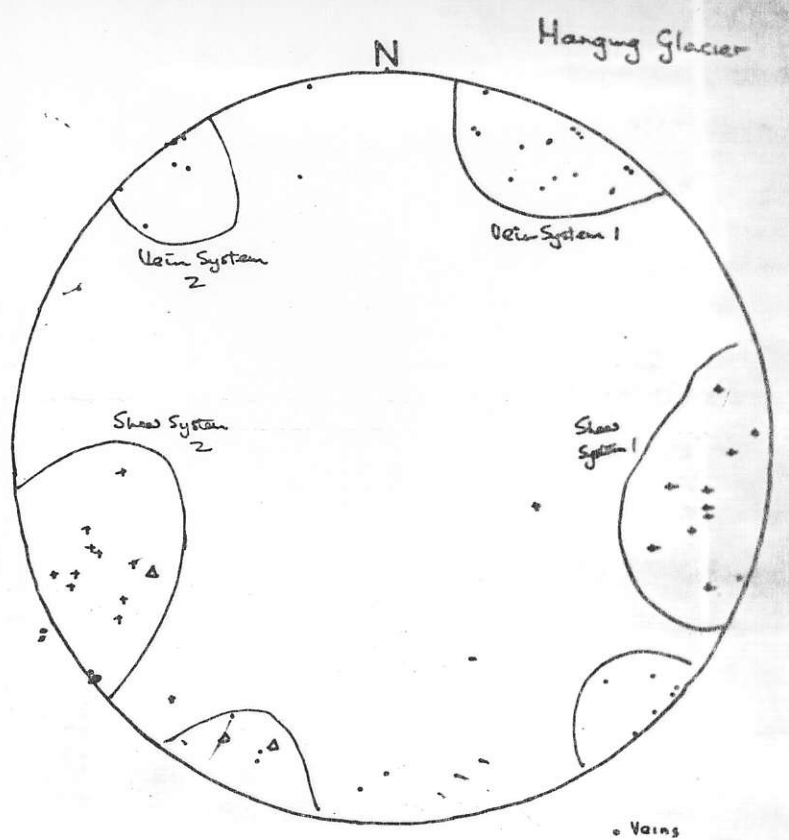
Key to Roy
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Plots

Structural Domains in the Sulphurets - Mitchell
Creek property.



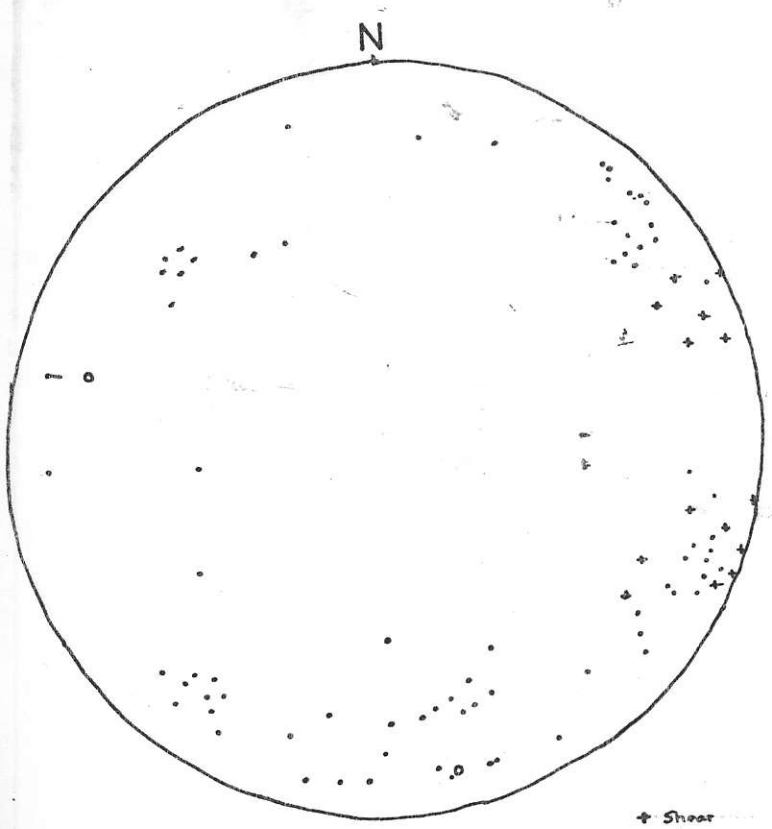
Poles to fractures plotted on lower hemisphere

- cleavage
- △ shear zone



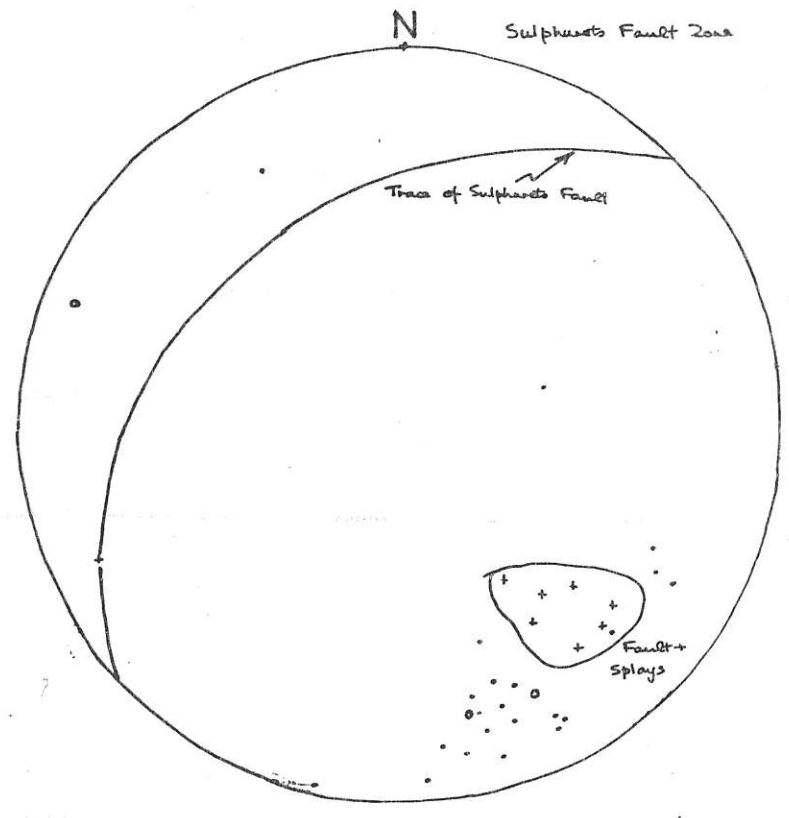
Plot of poles to veins, fractures, bedding plotted on lower hemisphere.

- Veins
- + fractures & Shears
- △ bedding



Poles to fractures plotted on lower hemisphere

- + Shear
- cleavage
- quartz vein

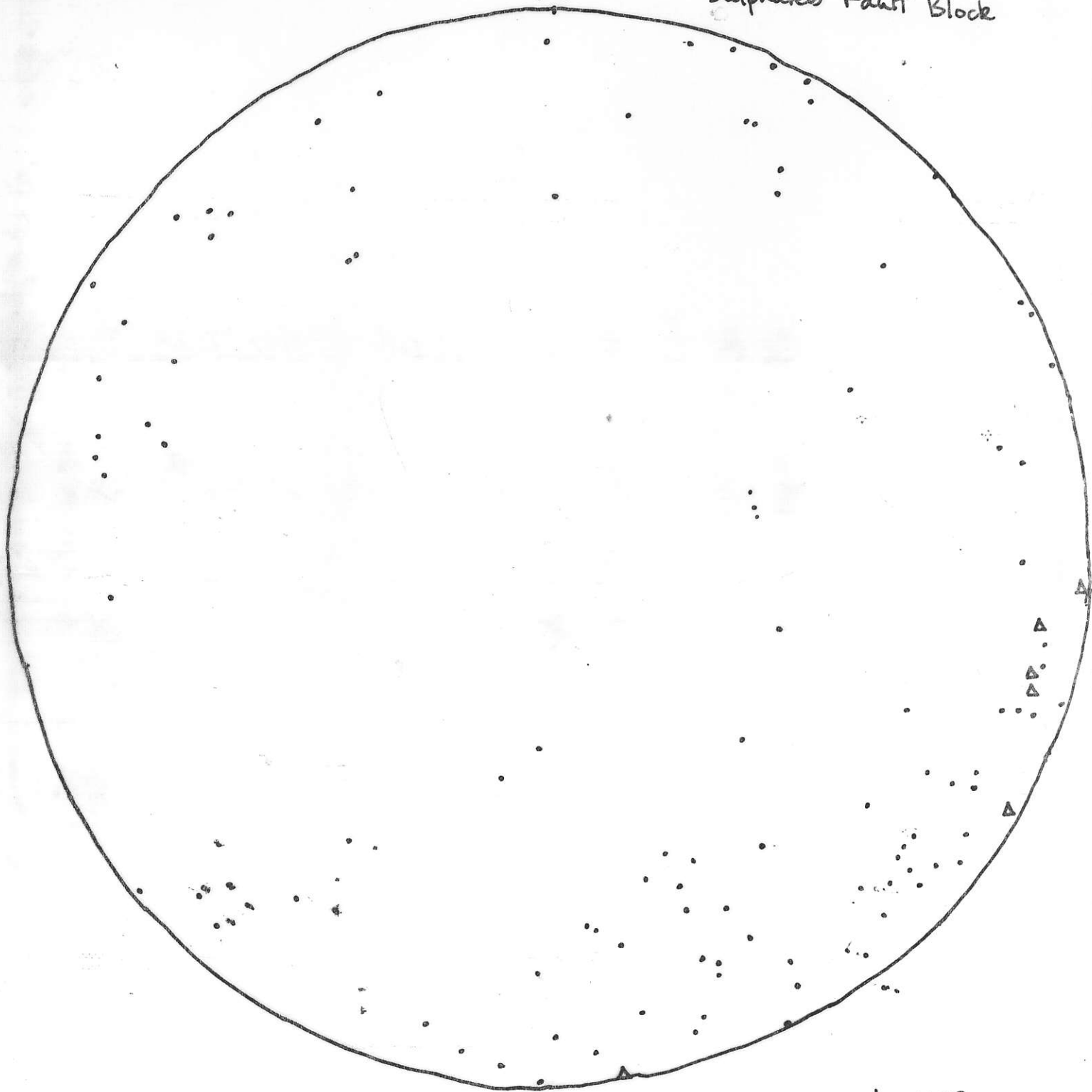


Poles to fractures plotted on lower hemisphere

- joint
- + shear
- cleavage & fracture
- △ cleavage

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Sulphurets Fault Block

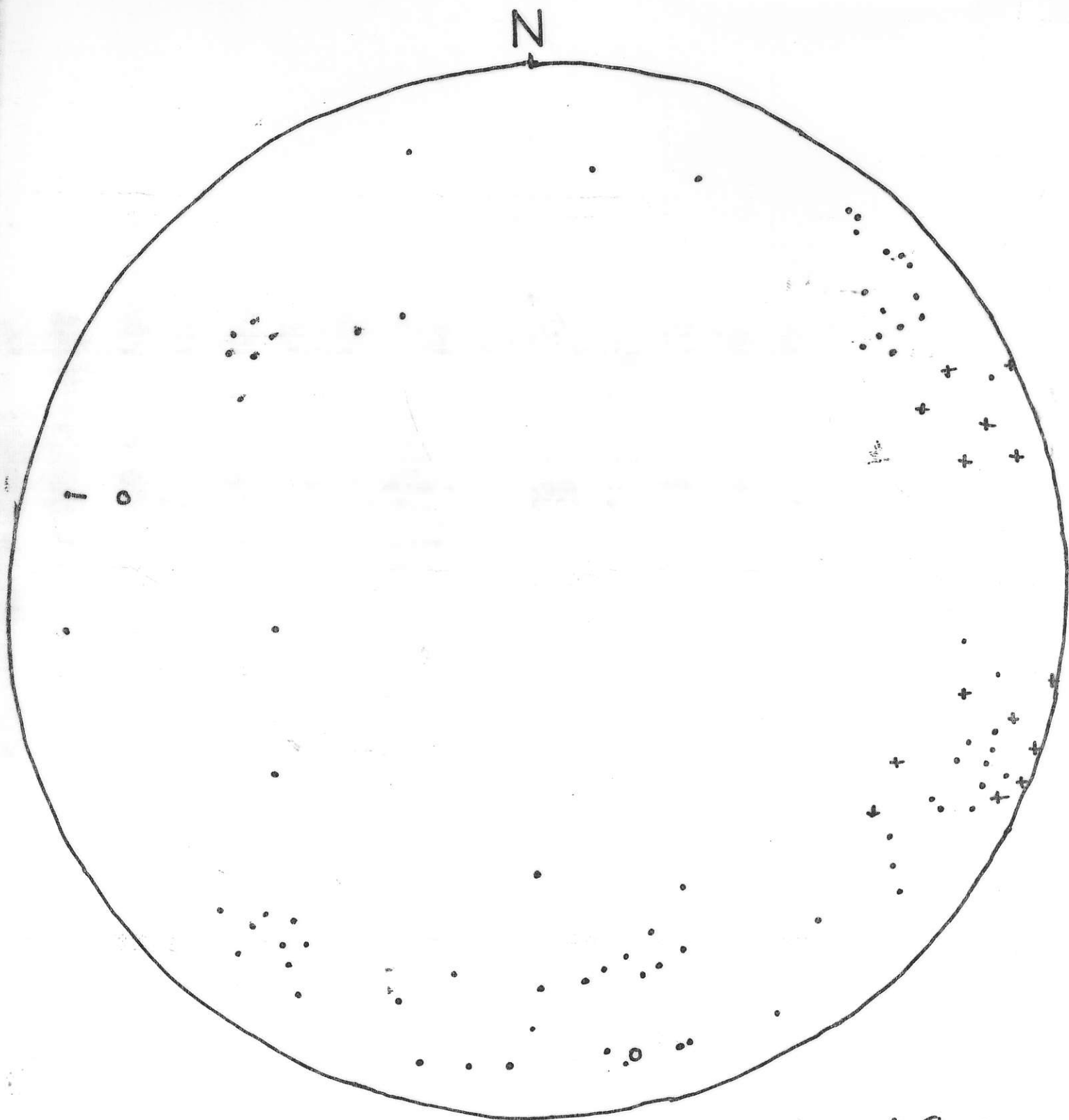


• cleavage

△ shear zone

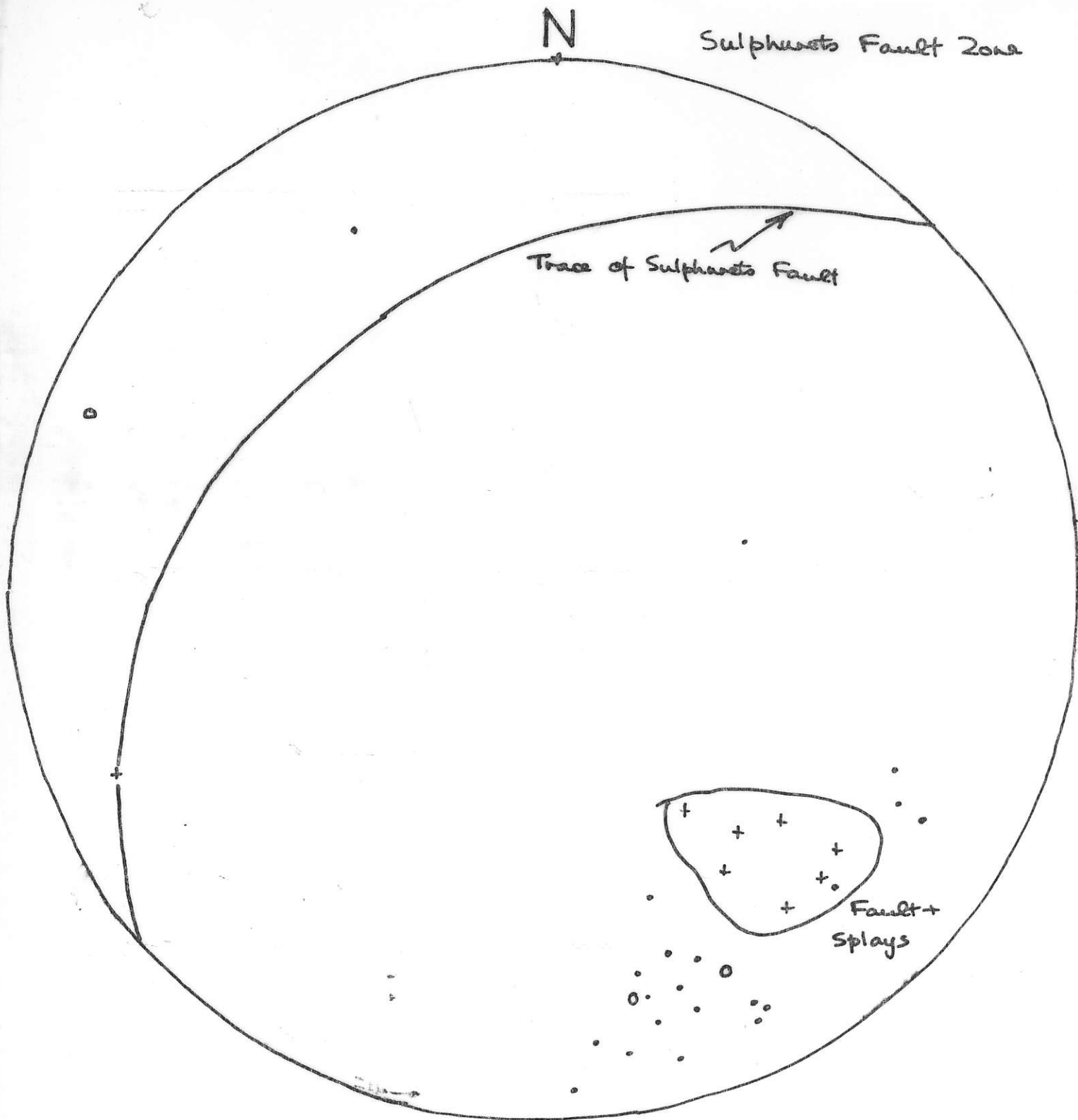
Poles to fractures plotted on lower hemisphere

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Poles to fractures plotted on lower hemisphere

- + Shear
- cleavage
- quartz vein

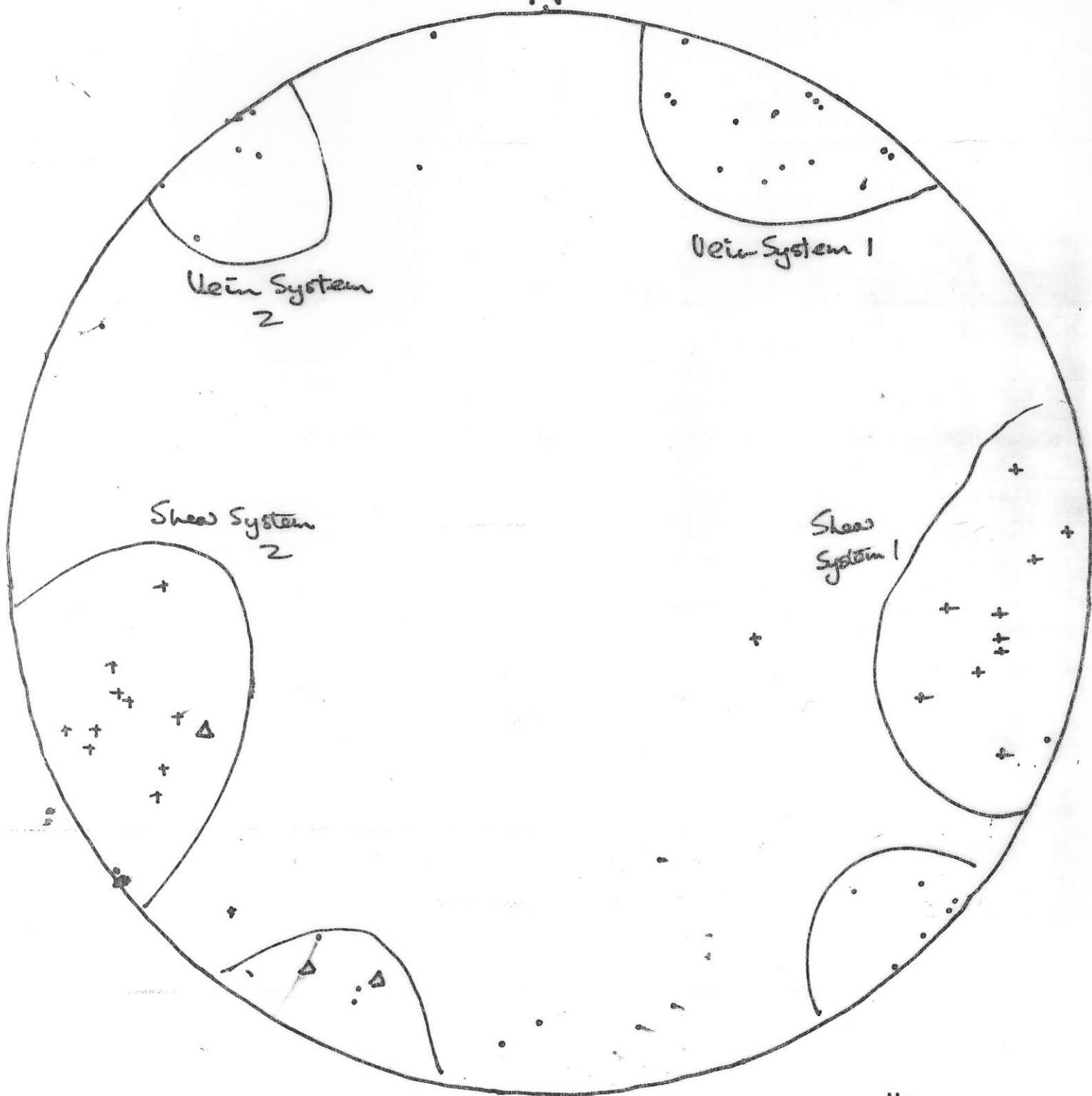


Poles to fractures plotted on lower hemisphere

- o joint
- + shear
- cleavage & fracture cleavage

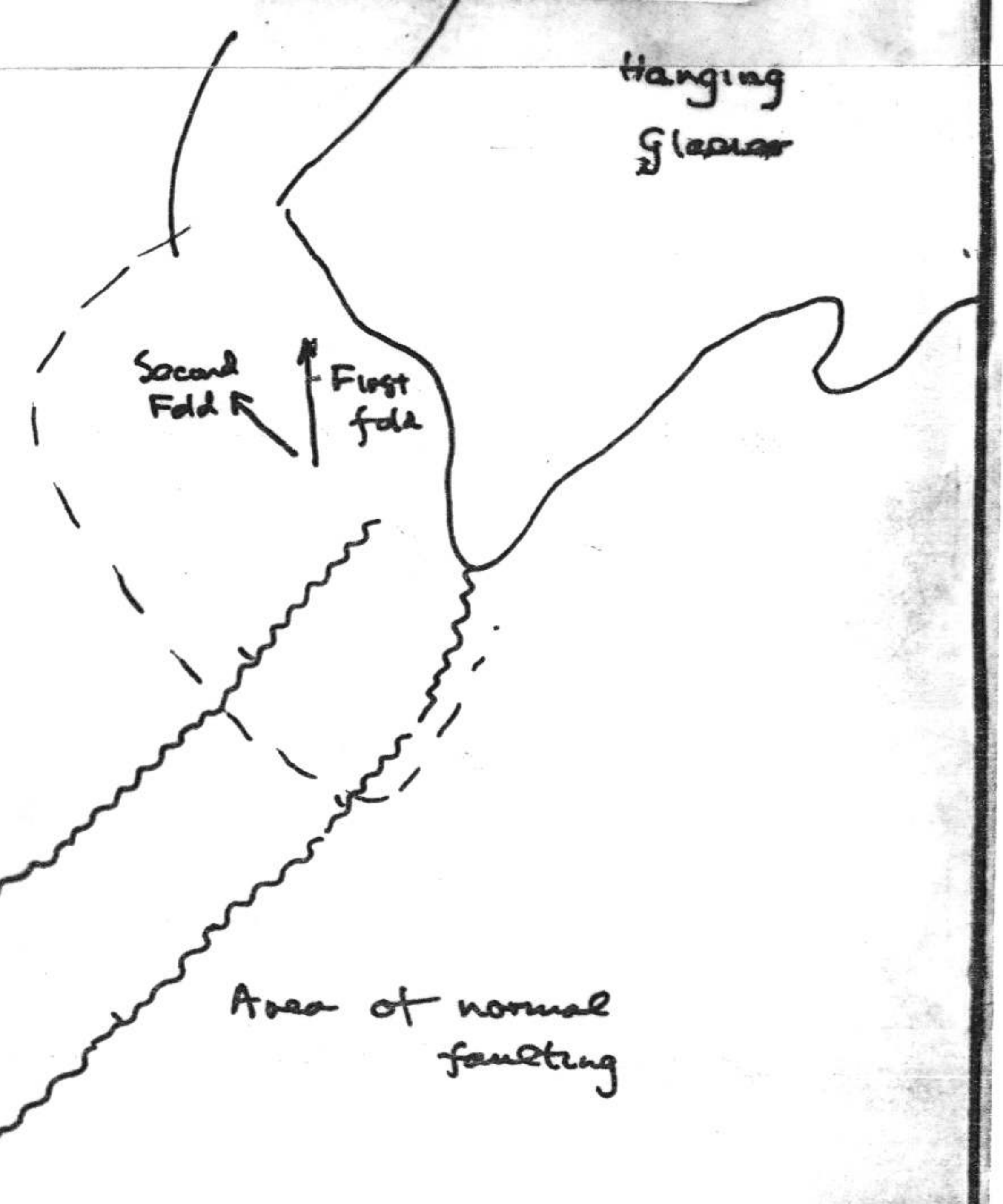
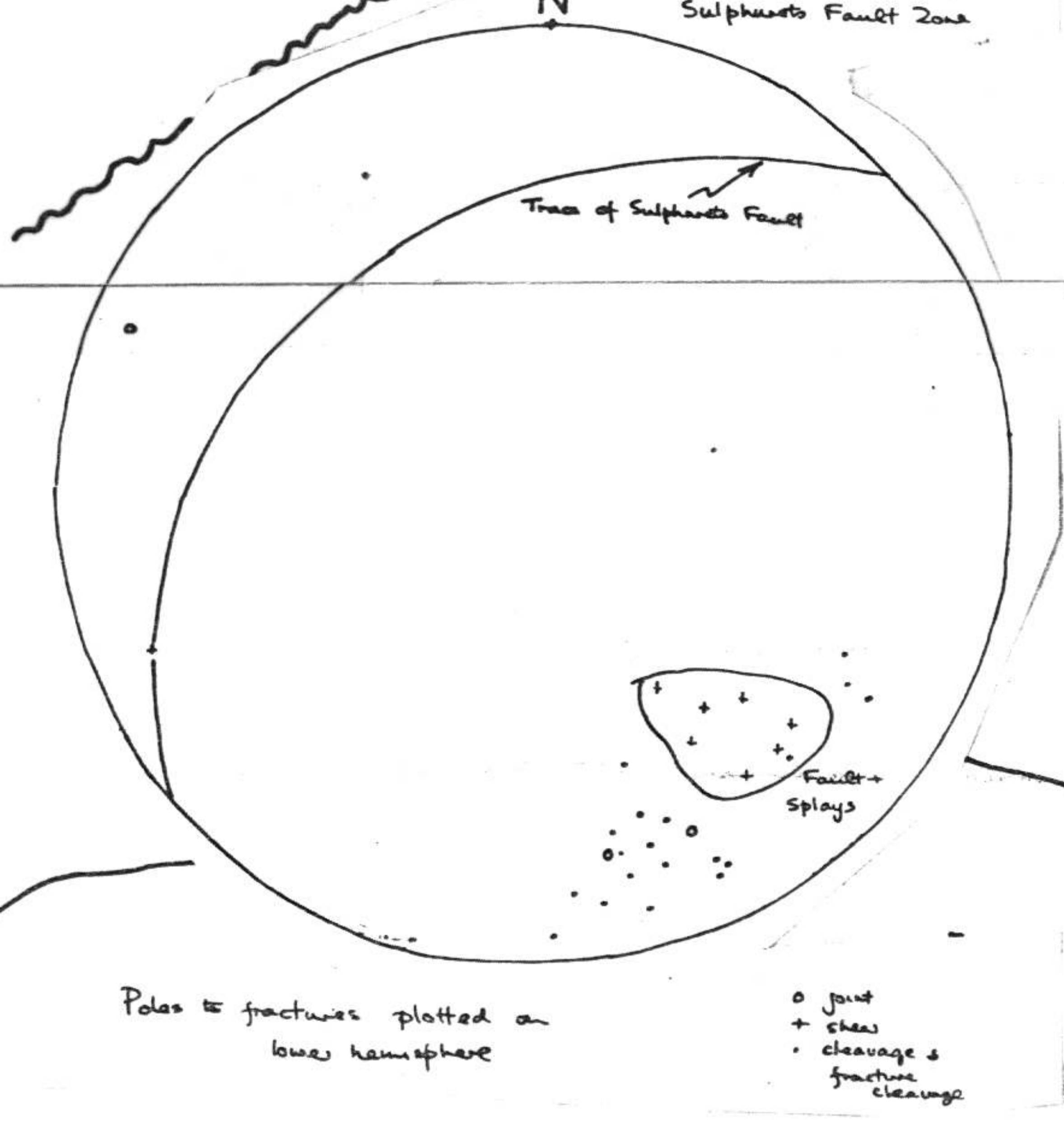
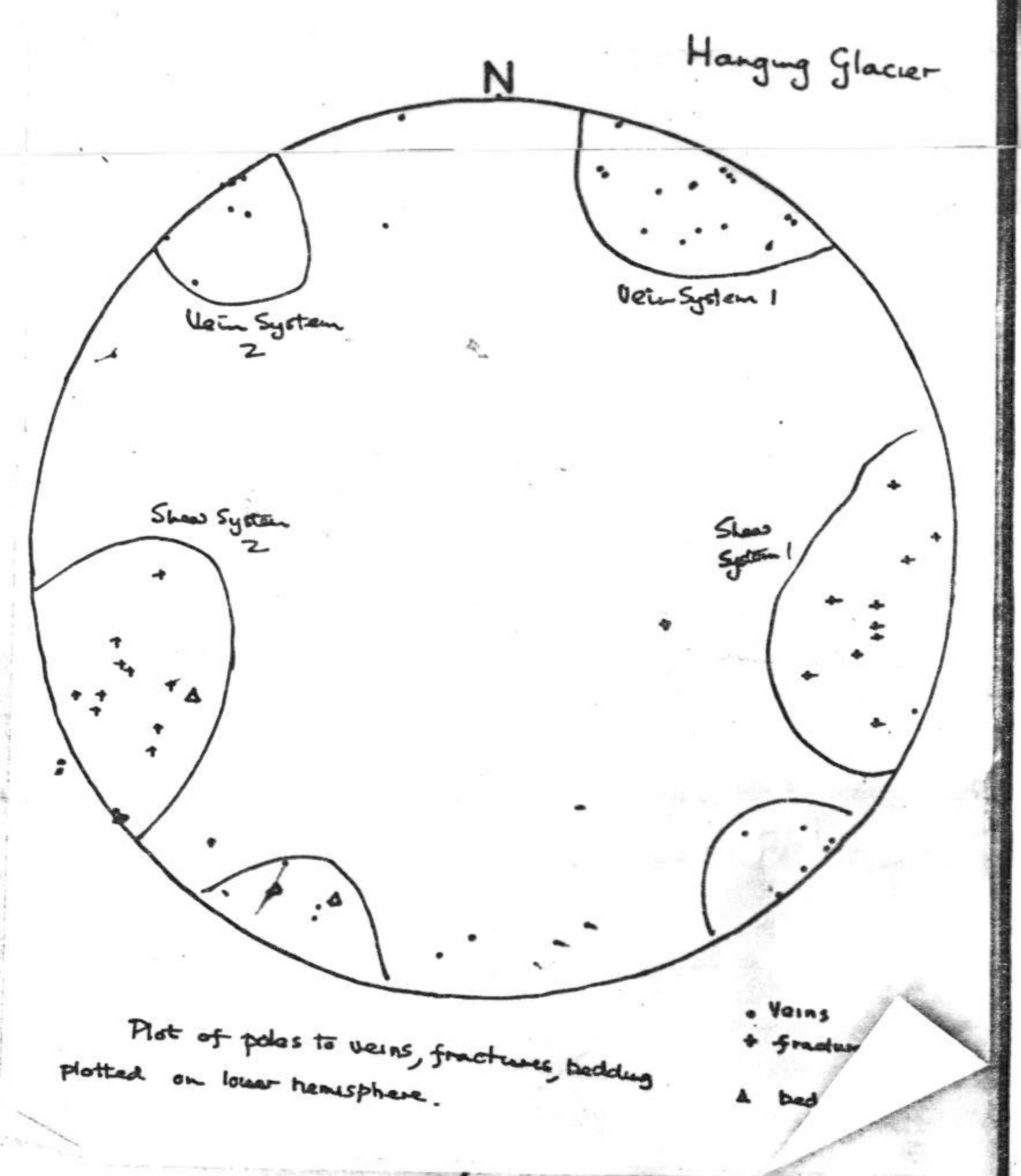
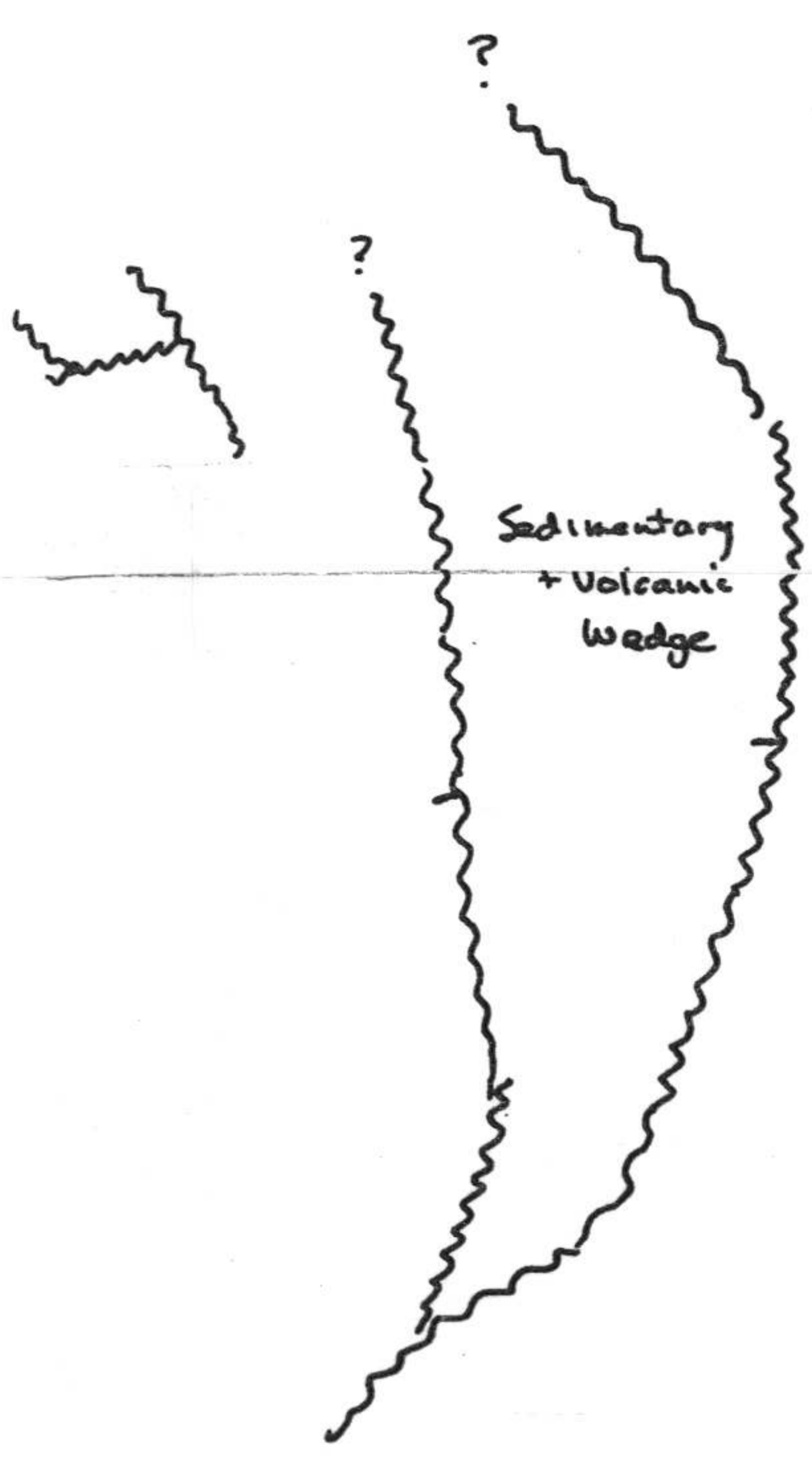
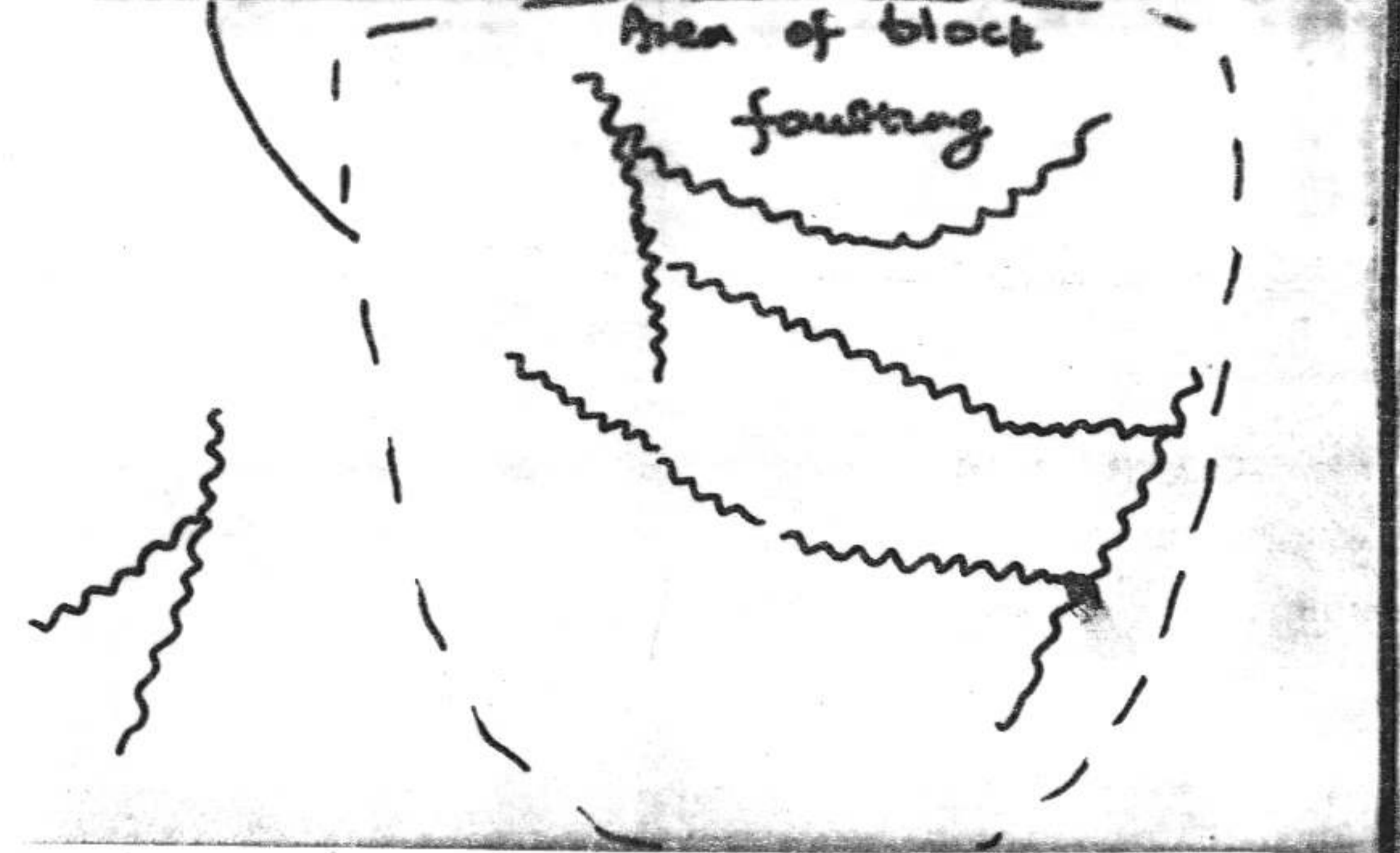
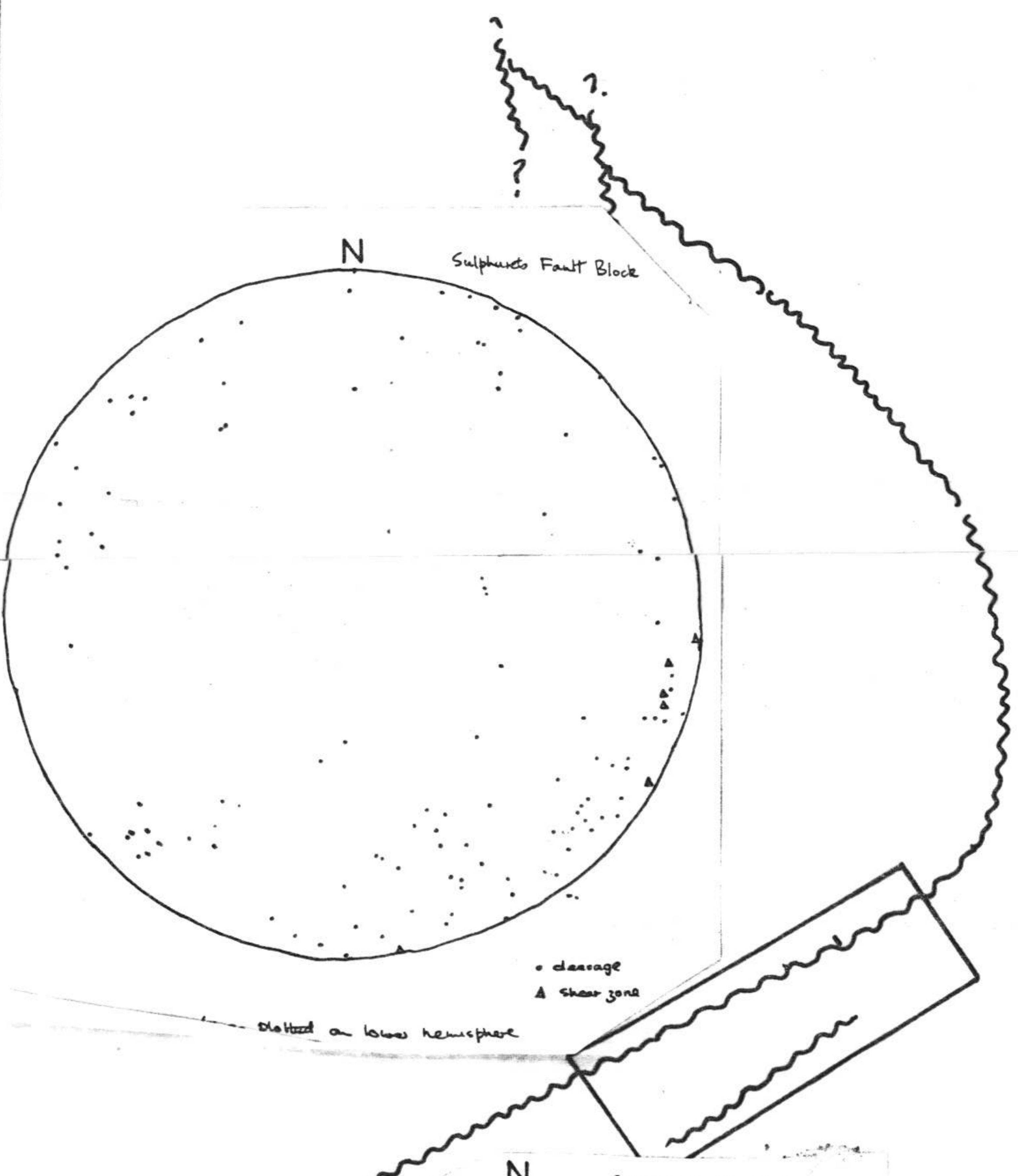
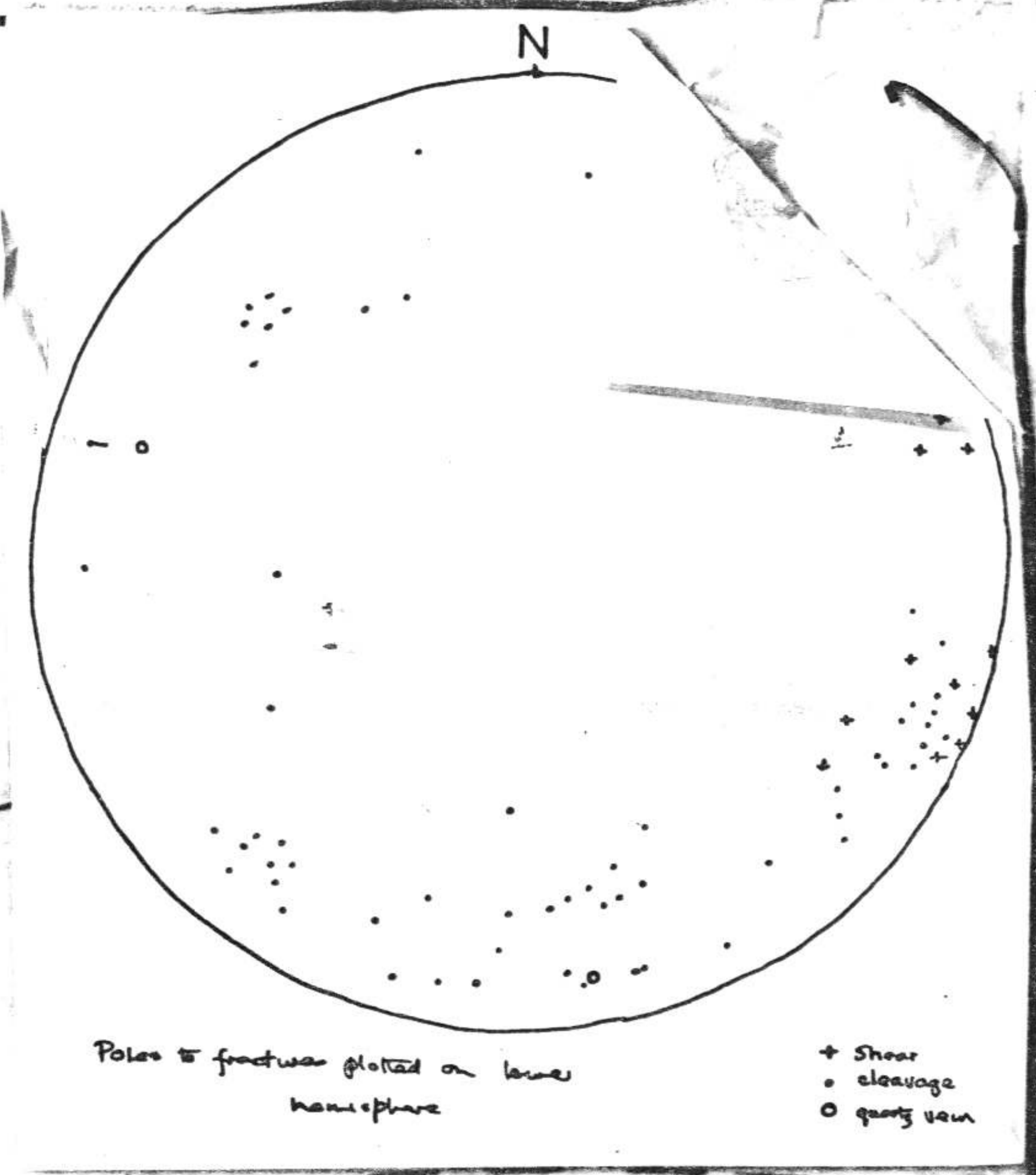
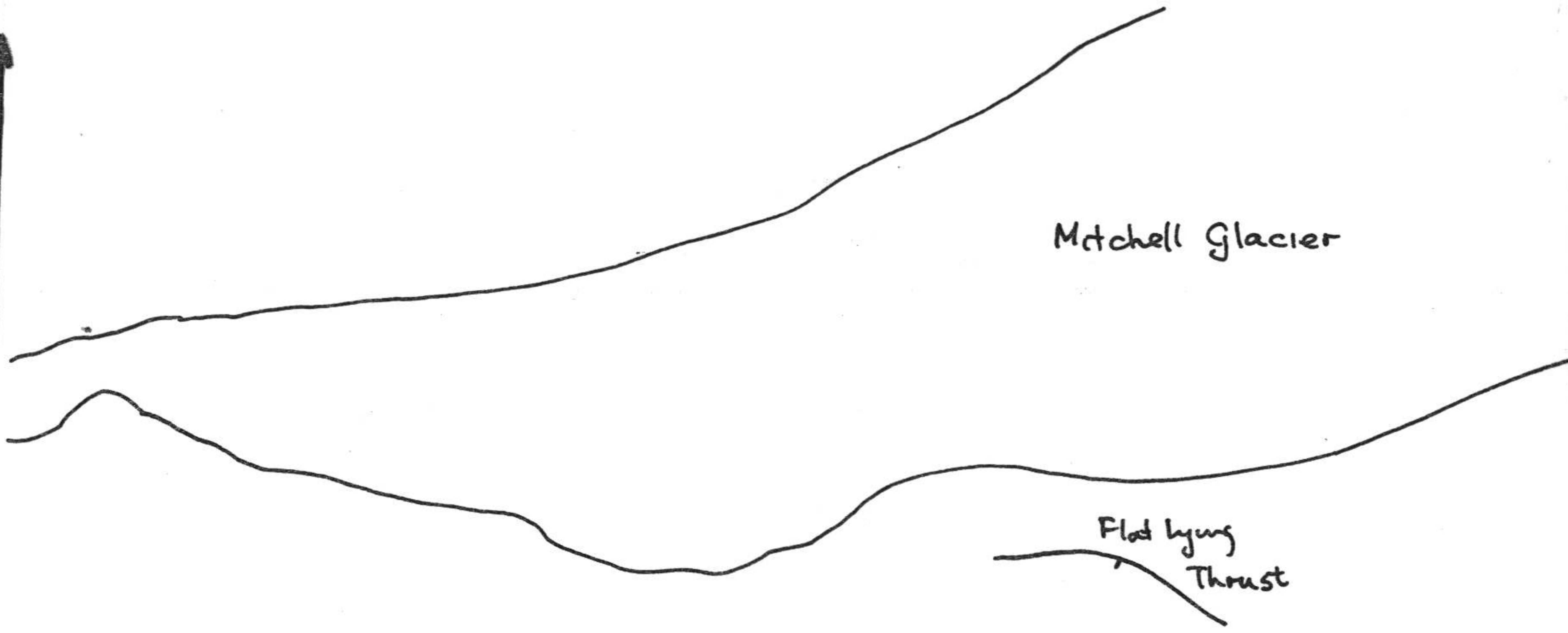
Hanging Glacier

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Plot of poles to veins, fractures, bedding
plotted on lower hemisphere.

- Veins
- + fractures & Shears
- △ bedding



Major Structural Features
Sulphurets - Mitchell Creek Property

Fig

