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A NEW KLIPPE OF
«II ZONA DIORITO-KINZIGITICA»
IN THE SESIA-LANZO ZONE

In the Orco-valley immediately north of the village Sparone, east of the Ribordone-valley (fig. 1), there are garnet rich gneisses. A short description of these rocks and the mylonitic contacts with the adjacent gneisses follows.

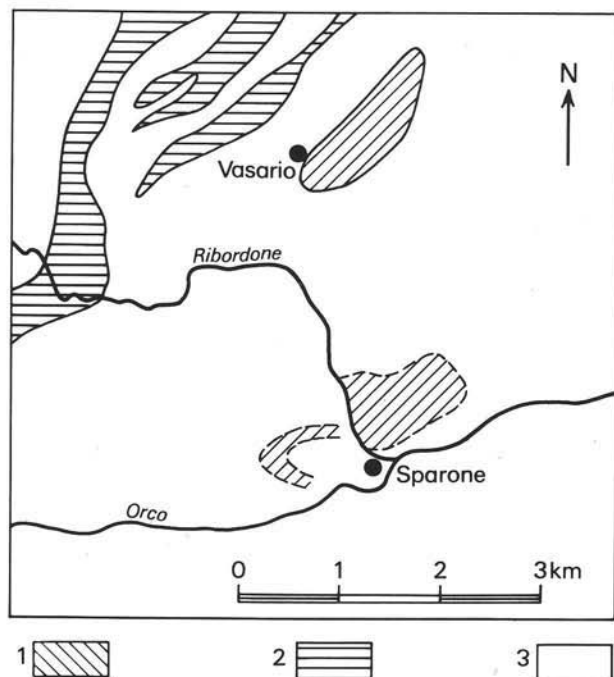


Fig. 1. — Sketchmap with the position of the garnet rich gneisses (II zona diorito-kinzingitica).
1) II zona diorito-kinzingitica; 2) Schistes lustrés; 3) Sesia-Lanzo zone.

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The garnet rich gneisses have a weakly developed foliation and garnet, blue-grey quartz and feldspar can be recognized with a handlens. The rocks are weathered to a reddish colour and a broad layering is visible.

Amphibolite layers and meta-pegmatoid veins occur in these compact gneisses. The foliation is sporadically folded in open folds.

Contacts between the garnet rich gneisses and the underlying rocks are mylonitic. The thickness of the mylonites is variable, but is often several tens of meters. Locally they are rich in chloritoid and glaucophane.

Similar rocks occur locally west of the Ribordone-valley, but due to lack of outcrop it is impossible to say whether they are continuous with the body described above.

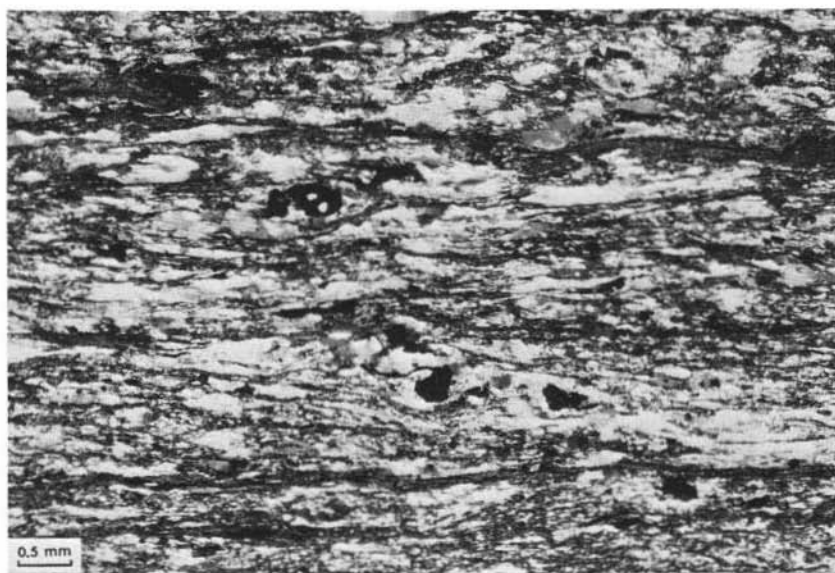


Fig. 2. — Mylonitic garnet bearing gneiss. The quartz is concentrated in ribbons.

The following micro-textural observations are made.

The main mineralogical elements are quartz, some white mica, clinozoisite, garnet and some sphene, rutile, glaucophane or chloritoid. Fine grained quartz is concentrated in lenses or ribbons which give the rock a granulitic appearance (fig. 2). The numerous sutured quartz-subgrains have undulose extinction, while sometimes mortar textures are visible. The small white mica and prismatic clinozoisite give rise to a weakly developed foliation.

Garnet could be present in different habits and generations. The oldest xenoblastic garnets (I) are commonly intensively broken. Locally clusters of rounded garnet-fragments remain from an original porphyroblast. Garnet II is occasionally

present as small idiomorphic crystals, but more often this generation give rise to overgrowth or recrystallization of garnet I or its fragments (e.g. former rounded garnet I-grains become more idiomorphic). Local regular alignments of rutile are present within these garnets (fig. 3); this is probably an indication of former biotites (R. COMPAGNONI, 1977).

The main foliation (S_m) curves around the garnets. S_m is defined by clinozoisite, white mica or fine prismatic chloritoid. Sometimes an older foliation of very small white mica is seen. This foliation is crenulated and transposed into S_m .

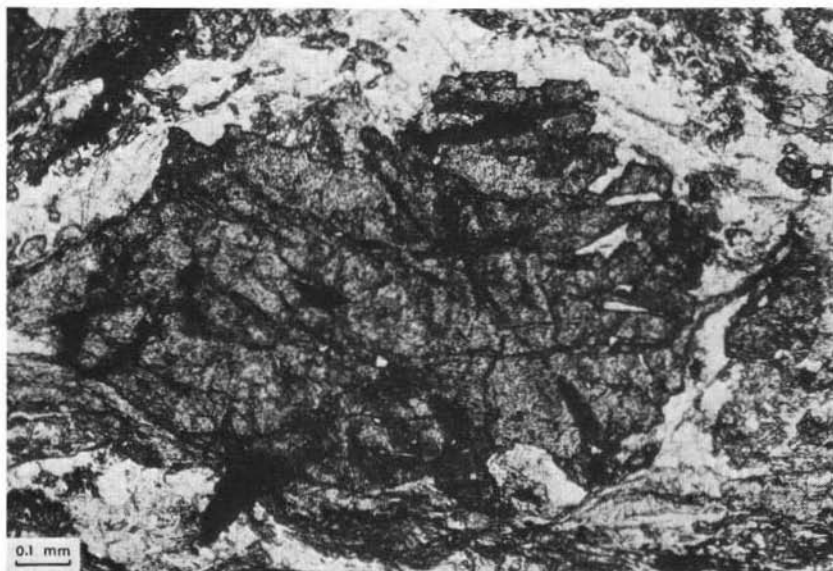


Fig. 3. — Garnet porphyroblast, with remnants of biotite now present as regular alignments of rutile.

In the mylonitic rocks S_m bends around large chloritoid- and glaucophane-porphyroblasts, both of which may include the broken garnet. In a few cases chloritoid includes glaucophane.

Some albite and epidote overgrows S_m . This foliation is sometimes crenulated, but no new schistosity is formed.

From micro-structural patterns the following (tentative) conclusions are drawn. They are presented in schematic form.

The abundance of garnet, meta-pegmatoid veins, amphibolite layers, blue-grey quartz and the tectonic contacts with the underlying rocks fits well with the characters of the « II Zona Diorito-Kinzingitica » (II D.K.) as are mentioned by F. CARRARO et al. (1970) (for further references on II D.K.-rocks see R. COMPAGNONI et al., 1977). The mylonitic textures post-date high-pressure minerals, which is in

agreement with the characteristics of II D.K.-rocks (G. V. DAL PIAZ et al., 1971). Therefore it is proposed that the garnet-rich gneisses north of Sparone are a new occurrence of the II D.K.. The II D.K.-knappe of Vasario (described by CARRARO

	D ₁	D ₂	D ₃	D ₄
(biotite)	sagenite			
garnet I	garnet II			
(sillimanite) x)				
(plagioclase)	white-mica	wh.-mica		albite
rutile				sphene
	coarse chld	fine chld		
	coarse glauc	fine glauc		
				chlorite
	breaking of garnets	vague foliation	crenulation S _m	crenulation of S _m

x) White mica-pseudomorphs after sillimanite have been found by R. Compagnoni (written communication).

et al., 1970) which is indicated on the 1:100.000 geological map nr. 42 (sheet Ivrea) of the Italian Geological Survey (see also fig. 1) is distinct from the present body, but lies in the same tectonic position.

REFERENCES

- CARRARO F., DAL PIAZ G. V., SACCHI R. (1970) - *Serie di Valpelline e II Zona Diorito-Kinzingitica sono i relitti di un ricoprimento proveniente dalla Zona Ivrea-Verbanò*. Mem. Soc. Geol. It., 9, pp. 197-224.
- COMPAGNONI R. (1977) - *The Sesia-Lanzo Zone: high pressure-low temperature metamorphism in the Austro-alpine continental margin*. This volume.
- COMPAGNONI R., DAL PIAZ G. V., HUNZIKER J. C., GOSSO G., LOMBARDO B., WILLIAMS P. F. (1977) - *The Sesia-Lanzo Zone, a slice of continental crust with Alpine high pressure-low temperature assemblages in the western Italian Alps*. This volume.
- DAL PIAZ G. V., GOSSO G., MARTINOTTI G. (1971) - *La II Zona Diorito-Kinzingitica tra la Valsesia e la Valle d' Ayas (Alpi occidentali)*. Mem. Soc. Geol. It., 10, pp. 257-276.