Abstract

ÉTUDE PÉTROGRAPHIQUE DES OPHIOLITES DE LA « ZONE DU VERSOYEN »

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ABSTRACT

The Versoyen zone is situated at the extreme front of the Pennic area of the Occidental Alps. It belongs to the subbriançonnais group of formations and the general structure consists of the alternate piling of layers of ophiolitic and sedimentary rocks throughout the length of the region. The degree of metamorphism is *sensu lato* that of greenschist facies.

Taking the region from the north-west to the south-east the layers of ophiolitic and sedimentary rocks vary fairly regularly. It can be roughly split into four sections, as follows:

1) In the west, north-west and northern border areas of the Versoyen very beautiful outcrops of pillow-lavas can be seen, together with calcschists of the " flysch " variety.
2) Adjacent in a south-easterly direction are layers several metres thick which are mainly constituted of massive greenstone—these layers sometimes contain pillow-lava structures at their edges. Black schists are alternately interspersed at this level and these often contain ophiolitic breccia.
3) Further south the massive layers of greenstone are even more thick. These layers are generally large and alternate equally with black schists containing no breccia. Along the junction between the greenstone and the black schist there is an important development of a kind of white ribbon, which is probably a variety of adinole.
4) Finally, at the south-eastern extremity of the region the ophiolitic masses become enormous. They are banded at the edge and are combined with a new type of sediment: a conglomerate with large blocks of limestone. " La Pointe du Clapey " belongs to this type of formation, but it also possesses exceptional petrographic characteristics which will be mentioned below.

It would seem that these different structures can be explained by a certain type of submarine volcanism. A certain quantity of lava could have risen to the bottom of the sea through different kinds of sediment which were still soaking wet. The largest mass of the intrusion solidified deeper down in the proximity of the conglomerate of limestone blocks. The other sills which are probably less dense, were formed at lesser depths in the argillaceous mud; in this latter case the formation of adinoles was favoured. The magma approaching closest to the bottom of the sea have given rise to explosions forming an ophiolitic breccia. Finally, on the bottom of the sea itself, pillow lavas have been formed.

" La Pointe du Clapey " is the most complex ophiolitic mass in this region. Various kinds of pyroxenite, chilled and banded edge, porphyric structures and intense copper and iron mineralisation

constitute its particular characteristics. Another special feature is the perfect preservation of the primary microscopic structures, which lack all lamination. It would appear that this last mountain was once a very large and complicated passage for volcanic lava.

Upon consideration of the metamorphism of this region it can be established that this consists of greenschist facies with a fairly large quantity of stilpnomelane and blue-green amphiboles, which are to be found in limited areas. Nevertheless, the appearance of a large quantity of blue amphiboles, garnets and stilpnomelane at " La Pointe du Clapey ", as well as the presence of blue amphiboles combined with adinoles, poses a problem which is rather hard to resolve. Considering the alteration of the primary rocks, structural microscopic considerations seem to indicate the important chemical role of different kinds of fluids, instead of the assumption of exclusive physical stress.

Taking only the zone studied here into consideration, the question arises as to whether the very localized appearance of these different parageneses cannot be partially attributed to deuteric phenomena (late-magnatic action). This assumption could, in certain cases, and above all in this case, explain the extremely localized variations in the metamorphic facies: greenschist—" glaucophane " schist.

From the tectonic point of view it follows from this schema that the central part of the volcanic system of the Versoyen is actually to be found in an inverted position.