CHAPTER VII

DISCUSSION AND CONCLUSION

Relations of the volcanic successions strongly suggest that the Lam Narai volcanic field evolved in essentially four major volcanic episodes: beginning with eruptions of the intermediate-composition lavas, changed notably to the pyroclastic explosions of silicic rocks to generate the deposit successions of silicic tuffs, subsequently followed by the extrusions of silicic lavas, and ending with the effusions of olivine basalt. The result of petrochemistry evinces that volcanic rocks of the volcanic field consist of two distinct suites. The intermediate-composition rocks and the silicic rocks (including both silicic tuffs and silicic lavas) are calc-alkaline suite, while the last basaltic extrusion is alkali suite.

Although the intermediate-composition rocks and the silicic rocks belong to the same differentiation trend of calc-alkaline suite. However, field evidences, especially the inclusions of basaltic andesite emplaced in the rhyolitic lava host, strongly suggests that the intermediate-composition rocks and the silicic rocks are the bimodal association of basaltic and rhyolitic magmas.

Although the complete petrogenetic model of the Lam Narai volcanic field has yet to be developed, but the relations of the volcanic successions, petrography and petrochemistry of rocks in the volcanic field may be compatible with the model of bimodal basalt-

rhyolite association as the following scenario. Basaltic magma is emplaced into the crust. Fractional crystallization, assisted by assimilation and the selective fusion of crustal rocks, yield a rhyolitic magma that gradually accummulates to form a diapir. The diapir rises through the denser superincumbent rocks. Batches of basaltic magma rise up below the diapir; however, because of their greater density, they are unable to pass through it. Gradually an elongate cylinder of more basic material develops beneath the dipir. As the slow-moving diapir of viscous material rises upwards, part of the more fluid basaltic magma is emplaced into the fractures that develop around the margins of the diapir. When the diapir comes close to the surface, some batches of basaltic magma are diverted into cone sheet; and swarms of nested cone sheets develop, with the intrusion of younger cone sheets inside older ones. Eventually the upper extremity of the diapir ruptures the surface layer, and silicic tephra is extruded explosively. The silicic magma that remains in the diapir is now at least partly degassed, and it rapidly loses heat to the surrounding rocks. Basaltic volcanism continues to recur, and as the upper level of the diapir cool and contract, basaltic magma is injected to fill the potential voids. The silicic magma that remains in the diapir stay in contact with a pool of basaltic magma, together with the movements of any hybrid magmas that they may generate, produces the many intrusive and extrusive features characteristic of volcanic centres that contain rocks of the bimodal basalt-rhyolite association.

According to the stratigraphic position, silicic lavas are thought to be the terminal event or the last phase of silicic eruptive activity. A single rhyolite lava flow which commonly

overlies on the top of pumice cones indicates that the extrusions of rhyolite lavas commonly follows resurgence of magma after the climactic pyroclastic eruption. This characteristic is similar to many eruptions of rhyolite throughout the world. However, the extrusions of rhyolite lavas are not always restricted to be the last eruption of silicic explosive eruptions. The large amounts of obsidian ejected amongst the pyroclastic deposits suggest that even while the explosive eruption is growing, the extrusions of rhyolitic lavas may continue.

Late volcanic activity in the volcanic field produced a widespread but thin veneer of basaltic lavas. These youngest basalts consist of distinctive olivine crystals both as phenocryst and groundmass, and their petrochemistry, and volcanic successions suggest that the last basalt should be generated from different magmas of the early intermediat-composition rocks and silicic rocks. The extrusions of the last olivine basalt can also be related to the northwest-southeast major fault. Nikom Jungyusuk and Panya Suriyachai (1987) suggested that the extrusions of these basalt related to activity of the Mae Ping fault zone which extend from the northwest.

it is now possible to conclude that All of volcanic activities in the Lam Narai volcanic field occured in the middle to late Tertiary time. This time strongly accords with the still preserved rhyolitic obsidian (undevitrified glass), the isotope age dating from late basalt by Barr and Macdonald (1981), from andesite, biotite-rhyolite, and sanidine rhyolite by Suporn Intasopa et al. (1990, cited in Nikom Jungyusuk and Sonboon Khositanont,1992).