9. A *Petrological Note on the Granitic Rocks near the Cape Ashizuri, Shikoku Island, Japan* (I).

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I. INTRODUCTION.

During his journey to Kōchi Prefecture for investigating the damages of the Nankai Great Earthquake that occurred Dec. 21, 1946, the writer caught his opportunity of observing the granitic rocks exposed near the Cape Ashizuri (Fig. 1), that had been described by SUZUKI in the geologic map "Sukumo" (Scale 1:75,000) of the Geological Survey of Japan as follows:[1)]

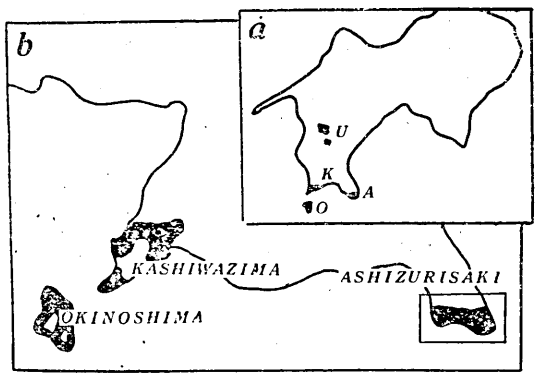

Fig. 1. Distribution of the granitic rocks in the southwestern part of Shikoku Island.
U=Uwajima, K=Kashiwajima, A=Ashizurisaki, O=Okinoshima.

"Biotite-granite exposed near Ashizurisaki afforded contact metamorphic effects to the Ōhama rocks. *The granite* found in the southwest of the sheet area occurs as stocks or bosses which may be protrusions from batholithic granite mass beneath

1) T. SUZUKI, *Explanatory Text of the Geological Map of Japan*, Scale 1:75,000. Sukumo (1938), 6.

the surface. The rock exposed near Kashiratsudo in Oku uchimura contains minute tourmaline needles besides essential constituents; quartz, orthoclase, plagioclase and biotite, the last being much abundant in quantity. Similar biotite-granite observed in the Uwajima sheet map area[2] intrudes the upper Cretaceous strata and is generally accepted as probably being of Tertiary age in eruption. This may be true with the granite occurring in the present Sukumo area."

Strictly saying, however, owing to no palaeontological data reported about the Ōhama beds, it is only afforded for this igneous mass to be pointed out that geologically it brought about the slight contact metamorphism of Ōhama beds, an unknown Mesozoic formation, and is covered with the Pleistocene gravel. But for the above description and the brief note by Jun SUZUKI in his paper summarizing the granitic rocks developing in the outer zone of Southwestern Japan and Ryūkyū Island,[3] there had been no report, especially a petrological one, about the granitic rocks until the writer's observation, the results of which will preliminarily be noted in the present paper from the following two points: 1) occurrence of the alkaline rock and 2) occurrence of the interesting xenoliths in the syenite. The granitic rocks containing alkali mafic minerals have been reported in Japan from Iwakijima as aegirine-eyenite[4] from Syodoshima as aegirine-augite-quartz-monozonite[5], and from the base of Nijo volcano near Osaka as the granitic rock containing green monoclinic pyroxene[6], and they occur exclusively as dike-like small mass in the granitic rocks belonging to so-called "Ryoke-zone" of Southwestern Japan. The similar rock was found from the sea-shore south of the tribe of Isa, and the xenoliths of interesting feature were remarkably observed in the quartz-syenite exposed along the highway from Ōto to Isa (Fig. 3 and 4.). The geology of this area was not sufficiently investigated owing to his short time staying, and the chemical investigation on these rocks and minerals is not carried out in the present state. He wants, however, to write down here something about these rocks in order to narrow the hiatus in our petrological knowledge about the granitic rocks distributed in the "outer zone" of Shikoku.

In performing this study, the writer is indebted to Kōchi Prefectural

2) T. SUZUKI, *Explanatory Text of the Geological Map of Japan*, Scale 1 : 75,000. Uwajima (1936).

3) J. SUZUKI, *Jour. Geol. Soc. Japan*, 44 (1937), 641, (in Japanese).

(4 J. SUZUKI, and T. NEMOTO, *Jour. Jap. Assoc. of Petrologists, Minsralongists, and Economic Geologists*. 8 (1933), 60.

5) M. SATO, *Explanatory Text of the Geological Map of Japan*, Scale 1 : 75,000 "Takamatsu" (1936), 32.

6) S. TSUBOI, H. KOIDE, and R. MORIMOTO, *Jour. Geol. Soc. Japan*, 49 (1942). (in Japanese).

Government in his field works, and to a grant from the Japan Society for the Promotion of the Scientific Research in his laboratory works, and he also owes much to Mr. Yamazaki's and Mr. Nagasaki's who kindly afforded him the field stations during his stay there.

II. Geology and General Petrography.

Geologically and petrographically, the rocks distributed in this area are grouped into (1) the hornfels derived from the shally rock belonging to Ōhama bed, (2) the biotite-quartz-monzonite consisting the main body of this igneous mass, (3) quartz-syenite locally developing in the monzonite (4) basic inclusions derived from pre-existing diabase or gabbro, a contaminated facies of the granitic rock, (5) the xenoliths in the quartz-syenite, (6) the quartz-syenite containing alkali mafic mineral, and (7) the dike rocks cutting the above-mentioned rocks.

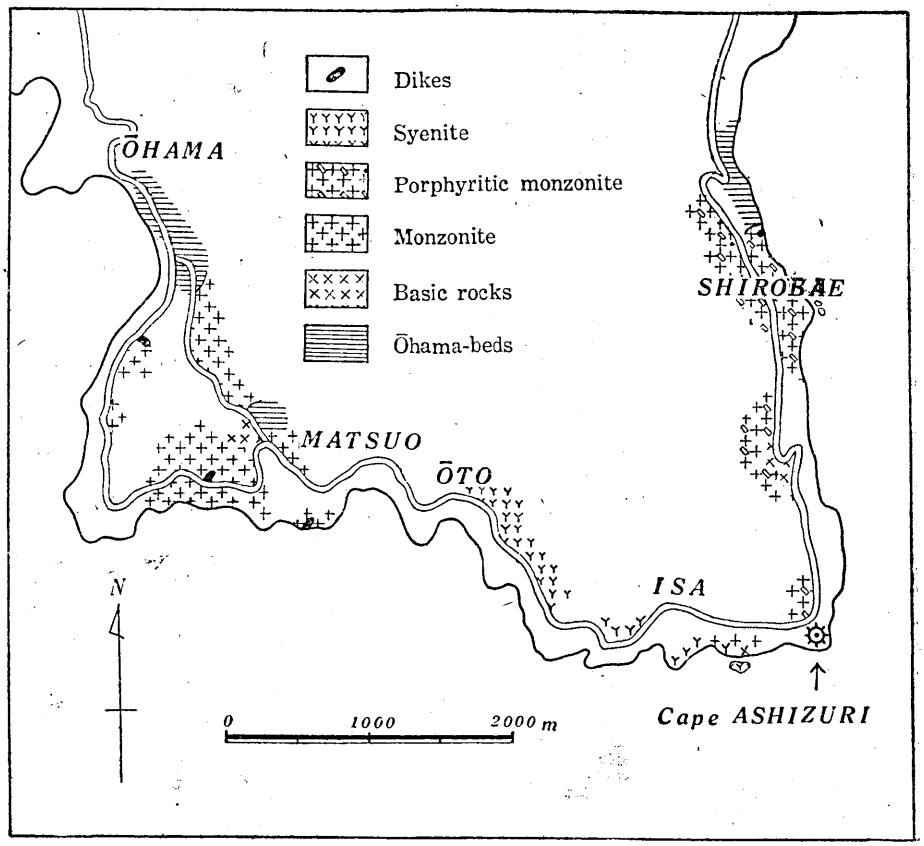

Fig. 2. Geologic route-map along the Cape Ashizuri.

(1) ŌHAMA-BEDS:

The rock is hard compact black shale or slate with remarkable fissility imbanding massive sandstone, and forms the monoclinic structure dipping to the northwestern direction. Near the contact with the monzonite, the shale or sandy shale change into hard hornfels with about 500m in width. But the contact effect on the Ōhama-beds by the granitic rock is quite simple and slight, and the grade of metamorphism does not attain to bringing about compicuous recrystallization of the hornfels even at the very contact with the igneous mass. The rock quite recrystallized into the mosaic aggregate of reddish biotite, quartz, orthoclase, and accessorily of microscopical dirty carbonaceous matter is only observable at the masses of biotite-hornfels reserved in the porphyritic quartz-monozonite as the roof pendants whose structure is quite parallel to that of Ōhama beds. No other hornfelses in the aureole indicate any remarkable reformation. The reddish flaky biotite are formed among the hydrous mica in the slate or shale and in the cementing matrix of the sandy shale. Mineralization is comparatively remarkable. Especially, silicification is one of the most conspicuous facts observed in this aureole, and the matrix of the original sediments is quite occupied by the interlocking fine grains of quartz. Chlorite-albite-quartz-veins intruding into the hornfels are exposed at the road-cutting along the seashore north of Ōhama, where pyrite-mineralization associated with these veins makes the hornfels have greyish appearance.

These hornfels have no more genetical relation to the petrology of this igneous mass than it contacts geologically with the granitic rocks described in the succeeding sections.

(2) BIOTITE-QUARTZ-MONZONITE:

The main portion of this igneous mass now in question consists of the medium– or coarse-grained biotite-quartz-monzonite which intruded, as a whole, concordantly into the Ōhama-beds. Porphyritic microperthite are predominant in the monzonite, so it sometimes gives a typical porphyritic appearance to its country rock. Such a porphyritic rock is exposed on the abrasion platform named "Shiro-bae" (a dialect which means white rock) developed along the eastern side of the peninsula. The coarse-grained leucocratic Shiro-bae monzonite is composed mainly of the large crystals of microcline-perthite and oligoclase, subordinately of biotite, quartz, and negligible amounts of apatite, sphene, zircon, and iron ore.

(To be continued.)

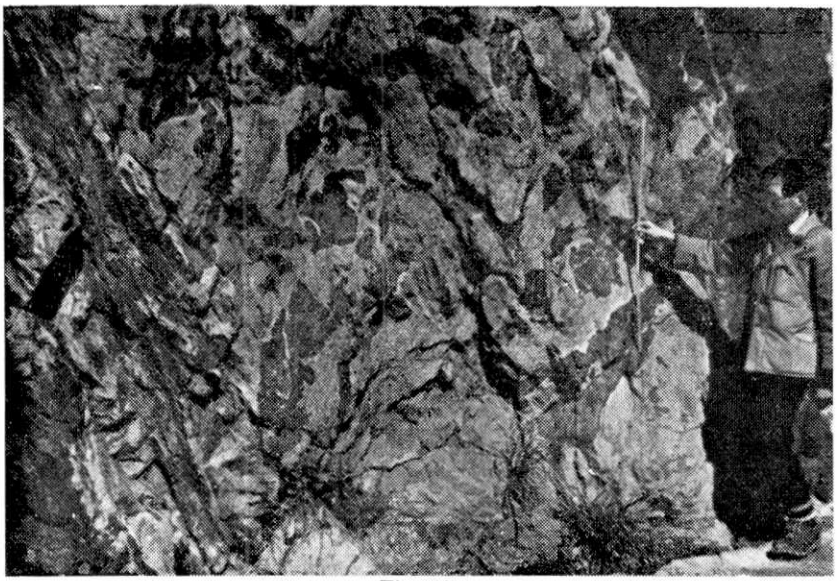

Fig. 3.

Fig. 4.