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K-AR DATES FROM THE STEVENS RIDGE FORMATION, CASCADE RANGE, CENTRAL WASHINGTON

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The Stevens Ridge Formation was first defined by Fiske *et al.* (1963). Prior to this separation, these rocks were included in the Keechelus Volcanics of Smith and Calkins (1906). The unit is most easily recognized by quartz-bearing ash-flow tuffs, although the tuffs are not ubiquitous in the formation.

The Ohanapecosh Formation underlies the Stevens Ridge, with an angular unconformity between them. Puget Group arkosic sandstones, which underlie the Ohanapecosh in the study area, but probably interfinger with it in other places, have been placed in the late Eocene to early Oligocene by Wolfe (1968); "andesitic volcanic rocks" overlying the arkosic rocks studied by Wolfe were placed in the Oligocene, as was the Ohanapecosh Formation south of Mount Ranier.

The Stevens Ridge Formation appears to be filling canyons eroded into the Ohanapecosh-covered terrain (Fiske *et al.*, 1963; Fischer, 1970). This obvious time gap suggests a distinct difference in the age of the formations. The hornblende age of 34 ± 1.2 m.y., however, is early Oligocene; the separation in time between the two formations is thus a few million years at most. Moreover, it does not appear likely that the hornblende has lost appreciable radiogenic argon, and thus should be a reliable measure of the age of the formation.

The biotite date of 23.3 ± 0.9 m.y. is from the same rock, and therefore indicates a reheating event. Most of the formation is characterized by zeolite-facies metamorphism, and thus it seems probable that the biotite records the age of that metamorphism. The nearest intrusive body is the Tatoosh complex underlying Mount Ranier, ten miles to the south. Activity there has been dated from 26.1 to 14.4 m.y. by Mattinson (1973); the activity nearest the Stevens Ridge rock was dated at 22.4 m.y., essentially equivalent to the 23.3 ± 0.9 m.y. of the biotite. Thus it appears that the Tatoosh intrusive activity has re-equilibrated the biotite, but not affected the hornblende. The distribution of the zeolite-facies metamorphism likewise suggests a heat source to the south (Fischer, 1970).

SAMPLE DESCRIPTIONS

1. CRS-413-H (Geochron #A-0989) K-Ar (hornblende) 34.0 ± 1.2 m.y.

Devitrified ash flow tuff (SW¼NW¼SE¼ sec. 7, T. 19 N., R. 9 E.; Greenwater 15′ quad.; Pierce Co., WA). Analytical data: K = 0.508%, K^{40} = 0.620 ppm, $*Ar^{40}$ = 0.00124 ppm, $*Ar^{40}/K^{40}$ = .00200; collected by: J. F. Fischer; dated by: Geochron Laboratories, Inc.; mineral separate by J. F. Fischer.

2. CRS-413-B (Geochron #A-0988) K-Ar (biotite) 23.3 ± 0.9 m.y.

Same devitrified ash flow tuff as 1 (SW¼NW¼SE¼ sec. 7, T. 19 N., R. 9 E.; Greenwater 15′ quad.; Pierce Co., WA). Analytical data: K = 6.2%, K^{40} = 7.64 ppm, $*Ar^{40}$ = 0.0105 ppm, $*Ar^{40}/K^{40}$ = .00138; collected by: J. F. Fischer; dated by: Geochron Laboratories, Inc.; mineral separate by J. F. Fischer.

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