NOTES AND NEWS

A PECULIAR TYPE OF ZONING IN FELDSPAR

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INTRODUCTION

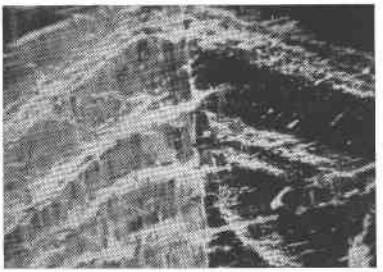
In connection with petrographic studies of the Lincoln Sill, southeastern Maine, a peculiar type of zoning was discovered, which, so far as the author is aware, has not been described in the literature. It is the purpose of this paper to describe and illustrate this peculiar zonal structure.

LINCOLN SILL

The rock from which the zoned feldspars were obtained is a peculiar syenite porphyritic which extends inland in a northerly direction for some fifty miles from Squirrel Island. Squirrel Island lies just off shore from Boothbay Peninsula and about forty miles east of Portland, Maine. The sill stands nearly vertical and is concordant, for the most part, with the regional structural trends. The sill is intruded throughout most of its length by granite and associated pegmatite. The average width of the zone of outcrops is probably close to half a mile. The prevalent type of syenite has a foliated structure due to parallelism of the biotite, which is the principal constituent of the groundmass, and to a lesser extent, hornblende. The zoned feldspars, varying in size, but averaging close to an inch in length, are for the most part aligned parallel to the foliation.

ZONING

The zoned feldspars are dark colored, varying from a dark gray to dark bluish tint, with alternating zones of lighter feldspar. The dark color seems to be due chiefly to minute inclusions which tend to be localized along certain of the zones. The identity of these minute inclusions is uncertain, but in part they appear to be rutile and hornblende. They vary from minute brownish globules, arranged in lines and frequently coalescing to form tiny rods, to well defined rods of a faintly pleochroic greenish tinted mineral with slightly inclined extinction, probably hornblende. The feldspars are for the most part orthoclase and microcline with considerable intergrowth of albite. The zoning of the more massive phases of the syenite appears to be the not uncommon oscillatory type. It is the author's interpretation that the minute inclusions just described may be replacements of the feldspar, localized along certain of the zones, perhaps because of slightly more favorable composition, possibly a slightly greater soda content.



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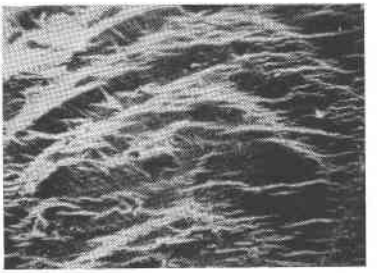

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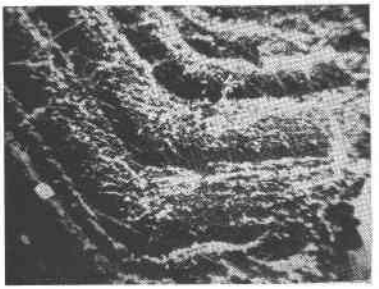

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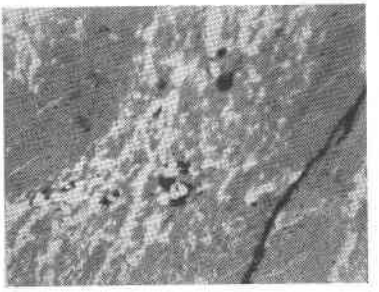

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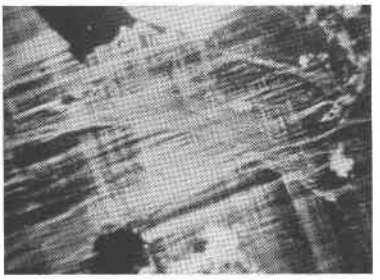

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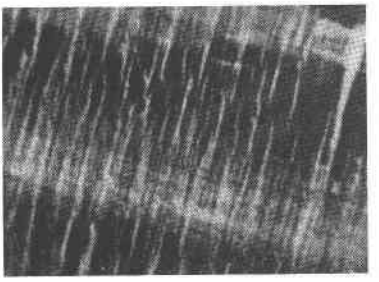

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FIG. 1. Perthitic intergrowth showing zonal structure. ×15.
FIG. 2. Perthitic intergrowth showing zonal structure less perfectly developed. ×15.
FIG. 3. Perthitic intergrowth showing zonal structure. ×15.
FIG. 4. Detail of FIG. 3. ×45.
FIG. 5. Perthitic intergrowth showing zonal structure. ×15.
FIG. 6. Detail of FIG. 5. ×45.

Besides the type of zoning just described, which is not unusual, a type of zoning was noted in the more foliated types, dependent upon the localization of perthitic intergrowths. This was observed particularly in the feldspars from the sill rock close to granitic intrusions. This type varies from clearly defined zones to much more irregular intergrowths, which, nevertheless, maintain a general zonal relationship within the crystals. This type is shown in various degrees of development in the accompanying figures.

Origin of Perthitic Zoning

The author is frankly at a loss to account for the localization of the intergrowths along zones. It might be suggested, however, that the later intrusion of the granite, which probably followed closely after the intrusion of the syenite, either maintained the initial heat of the syenite or added new heat, so that the later cooling was delayed, with the resultant unmixing of the albite from solid solution forming the perthitic intergrowths along those zones particularly rich in the albite molecule. This suggestion is analogous to the suggestions of Harker[1] concerning the formation of perthitic intergrowths during retrograde metamorphism; and if the intrusion of the later granite was accompanied by differential stresses, as appears to be the case, this might favor the separation of the perthitic intergrowths.

Acknowledgement.—The author wishes to thank Professor A. N. Winchell for criticizing the manuscript.

[1] Harker, Alfred, *Metamorphism*, p. 351, 1932.

AMYGDALOIDAL DIKES

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Although amygdules are much less common in dikes than in lava flows, amygdaloidal dikes have been described from various localities.[1] The Colorado occurrence here described is unusual in that plagioclase feldspar is present in some of the amygdules.

The San Juan mountains of southwestern Colorado are composed principally of Miocene volcanic rocks.[2] Seven miles west of the town of Ouray is the Stony Mountain-Sneffels Peak stock of gabbro-diorite. Associated with the stock are andesitic dikes one to fifty feet wide, intruding the volcanic rocks. Microscopic examination shows the dominant constituent of the dikes to be plagioclase feldspar in the andesine

[1] Morris, F. K., Amygdules and pseudo-amygdules: *Bull. Geol. Soc. Am.*, vol. **41**, pp. 383–404, 1930.

[2] Cross, W., and Larsen, E. S., *U.S. Geol. Survey*, Bull. **843**, pp. 50–53, 1935.