AN ABSTRACT OF THE THESIS OF Richard Charles Marty
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Title: Formation and Zonation of Ferruginous Bauxite
Deposits in the Chapman Quadrangle, Oregon.

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Two major theories have been advanced to account
for the scattered distribution of ferruginous bauxite
deposits. Original workers proposed that ferruginous
bauxite originally developed over all exposed Columbia
River Basalt in western Oregon and was subsequently
removed by erosion. Studies which followed have suggested
that it may be locally favorable conditions, especially
of drainage, which are responsible for deposit distri-
bution. Field mapping in the Chapman Quadrangle shows a possible correlation between a series of sheared zones, which may have improved drainage, and the distribution of ferruginous bauxite deposits. Examination of the pisolithic zone ferruginous bauxite of the Chapman Quadrangle failed to show any evidence supporting the theory that this zone was produced by fluvial action. It appears, instead that the pisolithic zone of the deposits studied developed in place and that the structures seen in this zone are the result of authigenic processes. Mineralogical study of samples from the Chapman Quadrangle suggests that the ferruginous bauxite of the area probably developed under slightly acidic pH conditions and that the assemblage quartz, kaolinite, gibbsite may exist in ferruginous bauxite deposits because of the presence of iron oxide and hydroxide coatings on the quartz which may cut off contact between quartz and gibbsite. Chemical study shows that the lateral variation in elemental concentrations is much less than the vertical variation in concentrations seen by some previous workers, and that lateral variation appears to be randomly distributed for most elements. The behavior of elements during weathering can best be modeled by taking into account the various sorptive reactions between ions formed during weathering and clays and hydroxides.