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## SUPPLEMENT TO U. S. GEOLOGICAL SURVEY PROFESSIONAL PAPER 209

## THE AJO MINING DISTRICT, ARIZONA

by James Gilluly

In 1928 two diamond drill holes were put down on the Bluestone claims south of the New Cornelia pit at Ajo, Ariz. During the preparation of Professional Paper 209, "The Ajo mining district, Arizona," Mr. Hoval A. Smith offered to make available to the U. S. Geological Survey the records of these drill holes. Unfortunately the information did not reach the author. Again in 1948, after the publication of the Ajo professional paper, Mr. Smith renewed his offer to make the drill records available to the Survey. These holes furnish data that necessitate some modification of the inferred position of the erosion surface on which the Locomotive fanglomerate was deposited. Accordingly, this supplementary note has been prepared. In addition, the following revised sections are included: sections B-B' and C-C' on plate 20; sections through coordinates 9 to 14 on plate 22; and the section through coordinate B on plate 23. Also a new map, plate 21A, has been prepared to show structure contours on the base of the Locomotive fanglomerate and the location of the two drill holes on the Bluestone claims.

The cores of these drill holes were examined in October 1948 by C. A. Anderson and N. P. Peterson of the Geological Survey, and they report mineralized bedrock below the Locomotive fanglomerate. Hole No. 1 is 2,253 feet deep, and the upper 1,492 feet is in fanglomerate. Hole No. 2 is 2,050 feet deep, and the upper 1,668 feet is in fanglomerate. The rock beneath the fanglomerate is highly silicified and sericitized, and locally brecciated. The upper part of the bedrock is oxidized and contains some native copper, limonite, and a few seams of chalcocite. At depths 200 feet below the bedrock surface, primary pyrite and chalcopyrite show no signs of enrichment or oxidation.

Most of the bedrock resembles the Concentrator volcanics, and examination of representative thin sections of the cores confirms this identification. In hole No. 1, at a depth of 2,000 feet, specimens of core resemble diorite porphyry, and this rock may be related to the

monzonite intrusive bodies; however, this rock is so altered hydrothermally as to make specific determination impossible.

The bedrock at these depths, beneath the Locomotive fanglomerate, may be part of an upfaulted block or of a buried hill which, after the tilting of the fanglomerate, would now appear as a more gently sloping basal surface of that formation. Although faults have been mapped at intervals along the northern contact of the Locomotive fanglomerate, no evidence has been found for a continuous northern fault contact, and the continuity of geologic boundaries north of the fanglomerate shows that no large fault can there exist. Movement along a fault near the southwest corner of section 27 (pl. 20) has brought the Concentrator volcanics against the Locomotive fanglomerate, but this fault seems to swing southeastward where it can be traced last near the boundary between sections 27 and 34. Hence it would have no effect on the altitude of the base of the fanglomerate as intersected in holes 1 and 2. Overlap of fanglomerate on bedrock is very evident where the contact is exposed. This is shown by the wedging out of the lower beds of the fanglomerate westward along the contact. The combined evidence now available from the drill holes in fanglomerate in this area (see pl. 21A) suggests strongly that the erosion surface on which the fanglomerate was deposited not only has irregularities but also, locally, has a relatively gentle slope. The presence of the bedrock in holes 1 and 2 at a higher elevation than would be inferred from the projection of the erosion surface is evidence that the irregularities, so evident along the strike, also exist down the dip. Although a concealed fault may exist and account for the relations, no fault of adequate displacement has been found.

Possibly future exploration will reveal beneath the Locomotive fanglomerate other areas where the bedrock is relatively near the surface. Some of them may be underlain by bedrock sufficiently mineralized in copper and close enough to the surface to constitute minable ore.

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