

Ore Deposits:

In the Aztec mine three types of ore deposits, probably formed at three distinct periods.

The first is the so-called "shale-ore". I regard it as the result of contact metamorphism. It is unique because of its high gold content whereas contact metamorphic ore deposits usually carry gold in relatively small quantities. Judging from Mr. Gatten's description there is a somewhat similar deposit in the AJAX-mine. There the gold is distributed through a dark, heavy, fine-granular rock consisting of nearly colorless pyroxene, amphibole, epidote, magnetite, a little zirconite, scapolite and specularite. The Aztec "shale ore" is a dark green, heavy, fine-granular crystalline rock in which the microscope might show the same minerals as are present in the Ajax-ore. In the field the rock seems to me to consist largely of greenish grains that I suppose to be zirconite or a small green garnet. Perry and Lock say the ore consists chiefly of chlorite. There is also considerable calcite in places. The gold is embedded in the green mass in ragged grains up to nugget size. It can often be seen with the unaided eye. There is a little pyrite or other sulphide present. The ore occurs in lens-shaped bodies from a few inches to several feet thick. These lenses lie either at the original contact or a few feet below it. The ore has been involved in the crushing of the shale and abounds in curved slickensided faces with a greasy feel. Underground it is difficult for a novice to distinguish it from the shale, but Messrs. Chase and Muir seem to have little difficulty.

It is quite evident that the ore has been formed from the shale. The minerals it contains, as already pointed out, are those formed by contact metamorphic action. About the only doubt remaining is as to the position of the intrusive rock. The objection to referring the metamorphism to the underlying dioritic sill is that the ore is separated from the sill by a 40 to 100 feet thickness of much altered and absolutely barren shale. However, this objection might be overcome by assuming that the ore represents a thin layer of shale that was a slightly calcareous and thus amenable to an alteration very different from that of the non-calcareous shale. But this would not explain how the

gold got into the ore-layer. I am inclined to think that somewhere a mass of porphyry was intruded across the original contact and that the metamorphic action spread out from it along the shale layer under the sandstone. The porphyry may have been removed by erosion or may be buried underground in some unexplored section. I could not determine where it is or was. It would be not only of interest scientifically but also important economically to know where the intrusions took place. Careful geological mapping of the vicinity of the mine when the snow is gone might yield some evidence as to its situation and suggest the probable distribution of the deposits. At present we know only that these shale-ore lenses seem to occur in a relatively narrow belt elongated in a North-Northwest direction aiming in a general way toward the French Henry Mountain. It is not my intention to go into minute details in this report, but rather to formulate the general principles that should govern the future exploration work, hence, I will say only that the shale-ore body that comprised the No. 4 bonanza and the ore now being mined near the 150-crosscut appears to have been 520 long and 15 to 30 feet wide. The general course was about 35 degrees W. The ore-body in a general way lay flat, but in detail it was somewhat undulating. A common form was that of a trough. The shale orebody itself was much complicated by the presence of Nos. 2 and 3 faults and a fissure that runs obliquely between these faults.

As this country is perfectly known to Messrs. Chase and Muir and besides has been largely mined, I do not see that anything can be gained by further details regarding this orebody except to remark that towards the Northwest the Aztec fault appears to have unroofed upon it and perhaps has cut a slice out of it and dragged it down below No. 1 tunnel level. Between stations 59 and 60 the Aztec fault seems to swing sharply toward the right, thus permitting another lens of shale ore to appear under it. This is about 60 x 40 feet in area. The ore plates 3 to 5 oz. gold per ton. Mr. Muir thinks about 150 tons remain. The orebody is like a shallow basin tilted and pressed

of the section on the ...
... under the ... the ...
... the ...
... were ... the ...
... the ...

against the lower side of the fault. However the fault in question is not the Aztec fault but an older fault of relatively small displacement that we called the ... fault, after the present ...

The 230-crosscut reached a small lens of very high-grade typical shale ore. From its habit of occurring in isolated lenses along the main contact, I do not believe that I can make specific recommendations for work except to suggest the general area in which exploration is likely to yield a favorable result and insist upon the work being kept as closely as possible to the original contact.

(signed Oscar H. Hershey)

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of the original Hershey-report
which Mr. Paterson, of Eagle Nest
N. Mex. had .-