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Uplift - Arches.

COCHITI (BLAND) DISTRICT, NEW MEXICO.

L.C.Graton:Ore Deposits of New Mexico.
USGS PP 68,1910,150-162.

Location: NE part of Sandoval Co. Elev.7500-8000'.

Production: A little over $1,000,000, 1894 to close of 1904.

General Geology: Monzonite, monzonite porphyry,diorite porphyry are the lowest rocks exposed. These have domed up, and in places cut across the beds of an impure feldspathic sandstone which may be Cretaceous (no Cretaceous shown anywhere near here,Geol.Map of N.A.) The igneous rocks correspond lithologically with types which appeared at the end of the Cretaceous,abundant in New Mexico.

Over the surface of these pre-Tertiary rocks,made uneven by erosion,was extruded a great flow of rhyolite,probably Miocene. 500-800' thick,and came from NW,with source in a vent near Pelado, a conical pile 11,200' high, 12 mi.NNW of Bland. This and nearby peaks constitute core of Valles mountains. Probably parts of a dissected volcanic cone, 15 miles in diam.,of ash,cinder etc. Around this rather steep cone is a 10 miles border of lava flows of similar composition;out-sloping but of lower gradient. Cut by streams radiating from the high point. Bland in one of these (Pino canyon),halfway between inner,upper margin of rhyolite slope,and outer,lower margin. These canyons have cut thru the rhyolite into the older porphyritic and granular rocks beneath.- monzonite, m.p. and diorite.

Mineral Deposits: Gold-silver. Gold less by wt.,but greater by value. In the underlying intrusive rocks. These are holocrystalline,but mainly porphyritic. Miners stated that a vein on the Posey claim,close to Bland,enters the rhyolite "cap rock" but forks to stringers and soon peters out. Could not be confirmed;other veins definitely do not enter rhy.

WIDENING OF VEIN WALLS.

Vein fractures typical of those formed at small depth;not simple, sharp, clean-cut, but complex fractures, "due to shattering that extended mainly along planes or zones...It is usually not possible to decide whether or not actual faulting took place along these fracture zones.There was, however,before the deposition of the ore,considerable displacement of the smaller fracture fragments from their former relative positions,so that much space existed between them,while what might be regarded as the walls were traversed by many small irregular cracks extending away from the main fissure." (p.153). Shattered CR highly altered,in part replaced. Ore minerals deposited partly in the interfragment spaces,partly by replacement of frags.and shattered walls.

Veins vary much in width,partly due to varying width replaced, partly due to varying width of shattered zones. Wider veins may pinch down to a few feet,than widen to 50 or 100'. Distance penetrated by replacing solutions perhaps not over 5' max.from channelway,ave.2-3'. Narrower veins more sharply defined.

N10W strike noticeably common; but strikes vary from N35E to N60W. N10W strike points toward vent:may be radial fissuring. Dips 60-90;no uniformity in direction of dip.

Quartz the dominant vein filling. Usually white, commonly rather fine-grained, differs from massive, vitreous quartz. Is a mosaic of rudely polygonal grains, most of which have similar but not identical optical orientation. Owing to the irregular shape of the spaces filled by the quartz, drusy cavities rather abundant; most common where vein contains many small frags. CR. In these places individual grains less than 1mm. across; prisms not more than 5 mm. long by 1.5 mm. across. Elsewhere, usually where the grains are larger, polarized light shows a radial structure in what seem to be definite individuals. Flamboyant quartz. Minute inclusions, many fluid-filled, common, in many places arranged along crystallographic directions, esp. parallel to vertical axis. Both fluid and solid inclusions likely to be most abundant close to periphery of grains. Some qtz. from Iron King mine, showing comb structure, is faintly violet, approaching amethyst.

Little Casina vein shows hackly quartz, De Lamar type; as thin to broad plates.

Sphalerite and pyrite most abundant sulphides, sphalerite the more abundant of the two; but both constitute not over 3% of the ore, except in unusually rich ore. Copy widespread in small scattered grains. Dark sulphide, probably argentite. Galena very rare.

Sphalerite s.t. present in grains or blebs as much as 5 mm. across, but usually occurs in groups of tiny crystalline grains, making dark patches in the quartz. In most places closely associated with the other sulphides. Pyrite varies in abundance, in different veins and in different parts of the same vein. Not always associated with sphal., for some occurs alone in groups of small grains. C.t. as cubes, but more commonly as irregular veinlets. Argentite (?) most commonly associated with the sphalerite.

Replacement, alteration. Hardening, change in color from dark greenish to light greenish gray. Mainly silicification. Original rock minerals replaced by extremely f.g. aggregate of irregular qtz. particles. The farther from the channels the finer grained is the sil. aggregate.

Wider-spread alteration: qtz. only in places where permeation was easy; chlorite rather plentiful; feldspars in part to sericite.

Thinks veins formed just before rhyolite covered them.

Low grade veins. Ore broken in stopes averaged $6/ton, ranging from $2-100 in small bunches. Au:Ag ration::1:14.

Pay shoots roughly equant; many seem to occur where lode is widest (formation by continued pulling apart of walls), and richest portions in widest places.

Ore pinches at depths of a few hundred feet; deepest ore in Albemarle mine, gave out at 600' below O.C.

Notes.- The veins are probably pre-rhyolite. Little Casina, N10W, 60E, has a hardened, 1 " clayey seam on HW, separating vein qtz. from rhyolite; FW is less well-defined, porphyry. Vein more banded than elsewhere; and has many narrow druses parallel to the wall. The good banding would seem to have been due to pulling apart parallel to the sharp wall, hence the wall is pre-ore. No proof to the contrary.

Copper in rhyolite;malachite coating fragments in crushed zones. The click is anxious to point out that the copper zones are younger than the gold-silver ore (because they are in rhy.). Precious metals also, reaching $2-3/ton.