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Spotted Horse Mine, Montana.

From " Some Gold Deposits of the Northwest" by Francis Church Lincoln, EMJ 8-26-11.

Location. In the Judith Mts, central Montana. 15 miles from Lewiston. The Judith mts are one of the isolated mt groups occurring in the plains country to the east of the Rock Mts.

General Geology. The mts are of laccolithic origin. Great variety of seds, middle Cambrian to Cretaceous. Injected porphyry formed a number of coalescing dome-shaped uplifts. Also phonolite dikes. Erosion has removed portions of the sedimentary cover, and often exposed the porphyr laccoliths.

Ore Deposit. Mineralized contact breccia, occurring where the qtz-por of one of the laccoliths projects in jagged masses into massive, white Miss ls; the contact is brecciated. The OB is extremely irregular; largely by replacement, to a less extent by cavity filling. Fluorite and qtz have replaced angular frags of the brecciated ls, and impregnated the massive ls. Porphyry also mineralized to a minor degree. Ore oxidized to 1000', greatest depth attained. Value $17-several thousand dollars per ton.

Oreshoots small and irregular; grouped togther, called boulders by the miners. They occur in the pure, partially crystalline ls darkened by organic matter, rather than in the shaley impure ls; richest found a short distance from the contact in the shatterd ls rather than directly on the contact. Richest ore coarsely crstalline light-gray ls with irregular masses of fluorite impregnated with gold. Other ores in ls of varying grain croosed by parallel earthy seams. Ore minerals are fluorite, qtz, py, gold telluride and native gold. Gold intimately associated with the fluorite. Native gold in particles or small cubical masses; rarely as much as 1 /32 inch thick and 1 /8 inch across. It is dark colored, spongy, platey. Derived from a telluride. Py is somewhat rare. May contain grains if telluride.

See Weed and Pirsson, USGS 18th An.Rep., 1898, Part III, pp 437-623.

E.N.Goddard, 1950: STRUCTURE OF THE JUDITH MOUNTAINS, MONE. GSA Bull. v. 61,1465

The Judith mountains are a group of coalsecing domes that rise about 2000 feet above the plains of central Montana. Sedimentary rocks ranging in age from Cambrian to Cretecous were invaded by Tertiary alkalic igneous rocks including monzonites,tinguaites,and granite. The larger intrusive bodies,around which the sediments are domed,were classed as laccoliths by Weed and Pirsson. However, detailed study of internal structures and contact relationships indicates that nearly all of these bodies are stocks that have broken through the Precambrian basement and domed the sedimentary rocks above. Dikes and sills are abundant in places.

Trap-door faults,bysmathiths,or punch structures and various intermediate forms are of special interest. On Kelly Hill, a remarkable hexagional fault block is hinged on one side and tilted like a trap door. On Pyramid Peak,a nearly circular stock has been punched upward and is surrounded by circular faults to form a bymalith .

It is suggested that the trap-door fault represents a nearly stage in the formation of a bysmatlith;intermittent upward pressure of the magma first domed the sediments,then opened the trap door,and finally punched up the solidified roof of the stock.

The mountains are bisected by a strong, irregular normal fault of general east trend and and moderate to steep northward dip. Nearly all the productive gold deposits in the mountains are along or close to this fault,and it is believed that the fault served as a trunk channel along which the ore solutions rose from depth.