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PROGRESS REPORT; COLORADO  
FRONT RANGE AREA

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METALLURGY AND CERAMICS

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## PROGRESS REPORT

### COLORADO FRONT RANGE AREA

During 1949 the reconnaissance work in the Colorado Front Range included the examination of 150 primary veins, 50 pegmatites, 20 deposits in sedimentary rocks, 5 disseminated deposits, 25 metamorphic and igneous rocks, 10 placer deposits, 25 spring and mine waters, and 10 mill and mill products for radioactive materials. Some 300 samples were collected for laboratory radiometric and chemical analysis; 50 samples were examined microscopically; approximately 1000 miles of road were logged radiometrically by carborne equipment. Radiometric testing of surface and underground workings, detailed geologic mapping of selected small areas of surface and underground workings, and sampling of radioactive areas were carried out on all known radioactive deposits from Prairie Divide, Larimer County to Canon City, Fremont County, Colorado. The most detailed work was done in the area between Jamestown, Boulder County, and Idaho Springs, Clear Creek County, because most of the known pitchblende deposits of Colorado are in this part of the State. These vein deposits, like most of the other types of uranium deposits examined, are small and probably cannot be worked profitably at present prices. However, little detailed geologic mapping of the deposits has been completed and possible extensions of them are poorly known. Work to date indicates that the pitchblende ore shoots mined in the past were small lens-shaped bodies that were scattered through the vein structure. There is no geologic evidence that these vein structures die out within the limits of the mines examined.

Corollary work on mineralogic and rock associations has shown that: (1) in the Central City area pitchblende occurs only in ores in which pyrite is abundant, only in or close to granite gneiss and only in those parts of veins that are within 500 feet of bostonite dikes; (2) the maximum concentration of pitchblende deposits and all deposits that were commercially productive are in a narrow area in which a large number of veins cut across a swarm of bostonite dikes; (3) the pitchblende occurrences occur close to altered and weakly to moderately radioactive bostonite dikes; (4) less altered bostonite dikes are more radioactive, having a maximum equivalent uranium content of 0.02 percent; and (5) that the less altered dikes are outside the richly mineralized area, and nearly completely enclose it.

The spacial relation of pitchblende to bostonite dikes suggests that dikes of moderate radioactivity may be indicators of ore, and the most radioactive bostonite dikes may constitute reserves of low-grade ore. Geochemical data bearing on the distribution of uranium in late-stage magmatic differentiates have been obtained.

Spectrographic analyses of pyrite from pitchblende veins to determine whether any minor constituents of the pyrite may be indicators of pitchblende, and a study of the relation between alteration of the bostonite dikes and the hydrothermal stage in which pitchblende was deposited are underway in the laboratory.

The pegmatite examinations made during the reconnaissance work in the Front Range area complete this phase of the project, except as new, unusual pegmatite deposits are found.

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