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Geochemical sampling at the Russell mine  
Montgomery County, North Carolina

by

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I studied and made a sketch map of the Russell mine (fig. 1), and sampled available faces of the Russell pit in November 1966. Samples were of a mixture of saprolite and fairly hard rock. No average can be obtained on the basis of these samples, but they give an idea of the range of values. Pardee and Park (1948) state that the average grade of ore mined from this pit was about \$2.00 based on \$20.00 per ounce gold. They apparently took this figure from a report by Nitze (1896). My samples indicate that it may be a reasonable estimate.

The ore is highly silicified to sericitized, pyritized, very thin bedded (varved?) sediment. It is probably tuffaceous, as it is interlayered with rhyolite pyroclastic rocks a short distance to the west. The rocks are locally strongly sheared, commonly at an angle to bedding, and in the east side of the Russell pit are folded into a tight overturned fold. The latter plunges steeply to the north and ore was stopped up from the bottom of the 150 foot shaft north of the pit into the north end of the pit. Some mining may have been under this pit, but 3 sections shown by Pardee and Park do not locate this clearly.

Quartz is rare in the deposit, but much of the sediment is so silicified as to resemble a hornstone, although bedding is preserved.

No unusual elements were found in semi-quantitative spectrographs. Most of the samples contain 1 to 5 ppm Be, and a few contain abnormal amounts of Mo. The following contain larger than normal amounts of some elements.

ABM 467	200 ppm, La,	200 ppm Co
474	7 ppm Ag	
605	1.5 ppm Ag	
606	0.7 ppm Ag	
607	1 ppm Ag	
608	2 ppm Ag	
609	150 ppm Mo,	700 ppm Ni, 5000 ppm Mn,
	150 ppm Y,	3 ppm Ag, 300 ppm La,
	700 ppm Co	(This is a rusty seam with clay
		0.2 feet thick.)

Because of the probable low grade of the silicified zones at the Russell mine, I would not recommend additional work there until the price of gold is in the range of \$150.00 to \$200.00 an ounce.

References cited

Nitze, H.B.C., and Hanna, G.B., 1896, Gold deposits of North Carolina:  
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Pardee, J.T., and Park, C.F., Jr., 1948, Gold deposits of the Southern  
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