

DEPARTMENT OF MINES AND RESOURCES

BUREAU OF MINES

CANADA

Ottawa, September 20, 1946.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 2104.

Examination into Nature of Gold-like Material.

(Copy No. 3.)

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Background:

A letter dated August 23, 1946, was received from Dr. T.L. Tanton of the Geological Survey, Bureau of Geology and Topography, Mines and Geology Branch, of this Department, Ottawa, accompanying a specimen of granular yellow metal.

This letter stated in part:

"The specimen was given to me by Mr. Miller, Mining Recorder, Sault St. Marie, who indicated that it came from a man suspected of presenting the substance to others in such a way as to encourage their identification of the substance as gold. I note that the gold-like color is confined to a surface film on the granules; the interior metal is sectile and bronzy and it gives a

(Background, cont'd) -

positive reaction for copper - and no gold. If convenient, I would like the material identified and an explanation of how it is made. Do you find it to be an article of commerce? Or might it be a special preparation for some useful purpose? If not, I consider a warning on the identification of gold would be in order."

Actually, two samples were received, one labelled "A - Granules - Yellow Metal as Received" and the other labelled "B - Granules same as A with outer film removed by brief treatment in strong acid".

Investigation:

The investigation of these samples took place under the following headings:

1. Spectrographic analysis.
2. X-ray diffraction analysis.
3. Microscopic examination.
4. General examination.

I. Spectrographic Analysis.

Samples A and B were found to be practically identical. Their composition is shown in Table I.

TABLE I. - Composition of Samples By Spectrographic Analysis.

	Constituent	Degree of Importance
Samples A and B	Copper )	Major constituent.
	Zinc )	
	Silver )	Faint trace.
	Vanadium )	
	Nickel )	
	Silicon )	
	Magnesium )	
	Lead )	
	Iron )	
	Tin )	
	Calcium )	
Titanium )		
Gold	None detected.	

Note. The titanium and vanadium were slightly higher in B than in A. However, in both cases only faint traces were present.

(Investigation, cont'd) -

II. X-Ray Diffraction Analysis.

Both samples were found by X-ray diffraction to be largely copper-zinc intermetallic compound having the formula CuZn. No gold was detected.

III. Microscopic Examination.

At approximately X100 magnification many of the particles were found to have striations on some of their surfaces. This would suggest that they may have been produced by machining. This operation may have been followed by some other operation, such as tumbling.

IV. General Examination.

It was found that particles from Sample B regained their bright gold-like colour when rubbed in a mortar.

Conclusions:

On the basis of the above data it is concluded that the particles submitted contained no gold but consisted almost entirely of an alloy of copper and zinc. The alloy was largely intermetallic compound having the formula CuZn. It is believed that the particles were produced by machining followed, probably, by another operation such as tumbling.

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