

## MINERAL DETERMINATION AND MINERAL TERMS.

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*(Continued from No. 11.)*

## TIN.

Tin is one of the earliest known metals, entering as it does into the composition of the ancient bronze metallic weapons, tools, etc. It ranks as one of the most important.

The Phœnicians traded in tin between ancient Britain and Tyre. Tin and oysters were the two products which made England famous in early times.

Nearly all of the world's supply is obtained from cassiterite, or tin stone, and occurs in square prisms and pyramids or similar forms. Twin crystals are frequently met with. The lustre is adamantine, and color brown, grey, yellow and black. Its hardness is 6.5 to 7, hard enough to strike fire on steel. Specific gravity about 7.29, and, when pure, contains 78.6 per cent. of metallic tin. It is most frequently found in granite, as in Cornwall, England, and occurs either in veins or disseminated through the rock irregularly. Stream tin is merely the rock disintegrated by nature by atmospheric or other causes and, probably, through being crushed, so that the rock has been washed away by running water, leaving the metallic stone more or less pure as float behind, in grains or pebbles of the mineral, and assuming sometimes a botroidal or reniform surface and in some instances a fibrous structure, of a brownish color and dull lustre, which is called wood tin.

Cassiterite may be comparatively easily recognized when the crystals are large by its high specific gravity, hardness, rich brown color and brilliant lustre. To test, grind some of the mineral in a mortar, mixing with it some sodium carbonate, and then roast it on charcoal, when small globules of white metal will separate, which should be malleable under the hammer, and not unlike silver though much harder. In nitric acid they oxidize into an insoluble white powder.

Cassiterite is found in small quantities in the United States, attempts to mine it, however, have been unsuccessful. The Cornish mines, in England, seem inexhaustible and have been worked for centuries. It is also obtained in the State of Durango, Mexico; Saxony and Bohemia, Europe; also in Borneo, Sumatra, Banca, Malacca, in the East Indies; Australia, particularly Tasmania, gives large quantities. All the tin mines of any importance are controlled by British capital.

There is another form of this metal known as tin pyrites or sulphide of tin (stannite), which contains generally 26 per cent. of tin, 30 of copper, 12 of iron, and 32 of sulphur, and is sometimes called bell-metal ore. It also occurs in veins in the primary rock, which is as often mined for the copper as the tin. Its crystalline form is cubic and somewhat similar to iron pyrites and gives a black streak on a hard surface; gravity 4.4.

Tin is a silvery white metal of high metallic lustre. At ordinary temperatures it does not easily oxidize, and is therefore used to coat vessels of copper or iron. As a metal it is malleable and soft, but, owing to its crystalline texture, is not ductile, having little or no tensile coherence. Through its crystalline texture, a bar of tin when bent emits a creaking sound, termed the "cry of tin,"—the *zinnigeschrec*, or tin shriek, of the Germans.

It is largely used as tin plates, which are employed in making tin vessels, roofing, etc. It enters into

many alloys, such as bronzes, known as gun-metal and bell-metal, together with copper; it also forms alloys with lead, in pewter; with antimony, in Britannia metal; copper and antimony, in babbitt metal; with lead and bismuth, in fusible metal; and with lead and antimony in queen's metal. Tin foil, one thousandth of an inch thick, is used for sundry purposes, and contains 96 to 98 per cent. tin, with small quantities of copper, lead, iron and sometimes nickel.

The annual consumption for the past few years has been 40,000 tons. The value of tin of late has been about twice that of copper and four to five that of lead. Tin is chemically related to the metals titanium, zirconium and thorium, and also to the nonmetallic element silicon.

It is also very generally accompanied by certain minerals, especially wolfram, schorl, topaz and lithemica.

*To be continued.*

## BRITISH COLUMBIA ORES AT SPOKANE INDUSTRIAL EXPOSITION.

The Spokane seventh annual Industrial Exposition was a decided success throughout its several departments. Particularly conspicuous, by its attractive character and its attention to details, was the Mineral Department of the Exhibition. Forty by one hundred feet of space was given to this display, and ores from British Columbia; and Idaho, Oregon, and Montana, U. S. A., were all represented in well recognized order.

Copper-gold, copper, iron, coal, from Kamloops and Similkameen.

Rossland was represented by twenty of the leading mines, B. A. Corporation showing two grades of matte, granulated, and a brick of slag, also a small box of slag wool, the product of the Le Roi Smelter.

The Boundary, Camp McKinney, the Silver Slocan, Ymir, Ainsworth and Nelson, conclusively proved the potentialities of our mining camps, which the ore and the development results incontestably show by the judges' awards, as follow:—

State or Provincial Collective Exhibit—  
First, British Columbia—Gold medal.  
Second, Washington—Silver medal.  
Third, Idaho—Bronze medal.

District Exhibit—  
First, Rossland, B. C.—Gold medal.  
Second, Nelson, B. C.—Silver medal.  
Third, Index, Wash.—Bronze medal.

Individual Exhibit—  
First, British American Corporation, Rossland, B. C.—Silver medal.  
Second, U. S. Marble Company, Spokane, Wash.—Bronze medal.

Gold Nuggets—  
First, Ymir District, B. C.—Silver medal.  
No second.

Free Gold Ore—  
First, Bill Nye Mine, Jackson County, Oregon—Silver medal.  
Second, Ymir District, B. C.—Bronze medal.

Silver Ore—  
First, Horn Silver Mine, Okanogan Co., Wash.—Silver medal.  
Second, W. A. Coplen, Slocan District, B. C.—Bronze medal.