

OSMIRIDIUM IN TASMANIANature and Composition

Osmiridium (which is the name always used in Tasmania) or iridosmine is a native alloy composed essentially of the metals osmium and iridium in varying proportions. Two varieties have been made depending upon the relative proportions of the two metals, but as the composition of the mineral appears to range continuously from ore rich in iridium to those rich in osmium, the distinction is more or less an arbitrary one. These varieties are - nevyanskite (with over 40% iridium) and siserskite (less than 30% iridium).

Osmiridium has a colour ranging from tin-white (the most common) to light-grey, silver-white, bluish-grey, and yellowish-grey, with a metallic lustre ranging from dull to splendid and glistening.

It is slightly malleable to nearly brittle; has a hardness of 6 to 7; and a specific gravity of 18 to 21.

Tasmanian Osmiridium

The osmiridium found in Tasmania is the nevyanskite variety. It is tin-white in colour and has a bright metallic lustre. It is obtained in flat flakes, and rounded grains of small size. The larger pieces and nuggets consist of aggregates of the above small pieces. The composition of Tasmanian osmiridium is given in the following table:-

	N.W. Coast	Bald Hill	Mt Stewart	Adamsfield
Osmium	57.09	33.46	25.22	45.6
Iridium	33.80	58.13	46.12	41.3
Ruthenium	8.19	5.22	9.24	6.6
Platinum	0.37		0.13	1.2
Rhodium	Included with Iridium	3.04	4.37	0.3
Palladium	0.21		Trace	Trace
Iron			6.30	
Gold			3.00	
Silica			3.71	

The first three analyses are those of individual samples, but that from Adamsfield represents the average of 19 accurate analyses. The Adamsfield samples have a very small range in composition and so the average given above represents very closely the general composition of the osmiridium.

Nuggets

Tasmania has produced the largest nuggets of osmiridium found in the World. The details of the largest ones are given in the tables below:-

North-Western Field

Discoverer	Weight (Troy)			Locality
	Ozs.	dwts.	grs.	
T. Prouse	4	6	6	Nineteen Mile Creek Heazlewood District
G. Nelson	2	8	8	Warner Ck. Heazlewood District
T. O'Malley	2	6	5	Ditto
C. Prouse	2	3	0	Nineteen Mile Creek Heazlewood District
Jas. Sweeney	1	19	7	Sweeney Creek, Wilson River District

In addition to those mentioned above numerous other nuggets ranging up to 2 ozs. in weight have been found in these fields.

The largest nuggets from the Adamsfield district are as follows:-

Discoverer	Weight (Troy)			Locality
	Ozs.	dwts.	grs.	
C. Stabbing & ) H. Hansen )	1	11	1	Main Creek
G. Glenn	1	7	17	Deep Creek
Copping	1	7	0	Main Creek
E. Smith and Partner	1	5	0	" "
Gadsby & Tudor	1	4	12	" "
W. Grove	1	4	0	" "
Tudor	1	0	4	" "

Origin of the Osmiridium

Practically the whole of osmiridium has been obtained from alluvial and detrital deposits. When these deposits are traced to their source it is always found that this consists of an area in which bodies of serpentine occur. It can also be stated that these serpentine bodies are generally accompanied by veins and irregular bodies of coarsely crystalline enstatite. All serpentine bodies, however, do not contain osmiridium and it was established by A. McIntosh Reid, Government Geologist in 1921, that the osmiridium-bearing serpentines are those derived from

peridotites containing orthorhombic pyroxenes such as enstatite and bronzite.

The same investigator also established the fact that the occurrence of osmiridium in these serpentines is restricted to pockety accumulations along definite structural plains in the rock.

#### Production

The total recorded production of osmiridium until the end of 1927 has been 20,671,598 ounces with a value of £481,831.

The annual production since 1910 has been as follows:-

Year	Quantity Ounces	Value £
1910	120	530
1911	271.88	1,888
1912	778.77	5,742
1913	1261.65	12,016
1914	1018.83	10,076
1915	247.048	1,581
1916	222.150	1,899
1917	332.079	4,898
1918	1606.743	44,833
1919	1669.715	39,614
1920	2009.196	77,114
1921	1750.655	42,935
1922	1173.924	35,512
1923	673.423	19,642
1924	364.805	10,617
1925	335.543	103,570
1926	3172.50	61,908
1927	632.687	7,456

#### The Mining Fields

The principal mining fields were restricted to the north-western part of the State until the recent discovery of Adamsfield in the south central division.

The Bald Hill and Savage River areas were the earliest known fields. These fields were worked for gold in the eighties of last century, when the osmiridium was of no commercial value and was regarded as a nuisance when obtained with the gold.

When uses were found for the mineral and a demand set in for it, the price gradually increased and the production rose accordingly.

The Mt. Stewart and Wilson River districts were discovered at later dates. From 1917 onwards work proceeded vigorously on all these fields. A maximum production of 2009 ounces was reached in 1920 and the production then decreased, due mainly to depletion of the richer deposits and also to a decrease in price.

Adamsfield was discovered in 1925 and the resulting production caused the years 1925 and 1926 to be ones of record production. A collapse in the market price caused the decrease in 1926 and still greater one in 1927. At the same time the resources at Adamsfield are largely depleted and large productions will probably not be attained again.

#### Mining Methods

The mining methods employed depend upon the local conditions of the deposits, the water supply, etc.

The most primitive method is panning or dishing. This is very slow and is only engaged in when water is not plentiful or "fossicking" is being carried out.

When the water supply is low and circumstances are favourable, "cradling" is employed in preference to dishing.

With a plentiful supply of water the alluvial ground is treated by methods such as "boxing" and "ground sluicing", which enable larger quantities to be treated.

Hydraulic sluicing is not engaged in as the claims allowed (half acre per man) are too small to permit of water-supplies being provided by means of races etc. and nozzles employed.

#### Uses of Tasmanian Osmiridium

The principal use of osmiridium is the supply of its component metals, iridium, osmium, etc. Of these iridium is the most important as it is alloyed with platinum in varying proportions for all purposes for which the latter is used. Russia is the largest producer of the platinum metals but it does not market osmiridium as such but as the component metals.

South Africa is at present the largest producer of native osmiridium having displaced Tasmania from that position during the last few years. There is a very important difference in the products of the two States, however, in that the South African osmiridium is very fine in grain, while the Tasmanian is very much coarser and ranges in size up to nuggets of several ounces in weight.

The South African metal is probably all treated and the refined metals produced. The Tasmanian product is however, particularly adapted for another very important industry, viz, the fountain pen one, because it furnishes grains of the desired size and physical characteristics suitable for putting tips on the gold nibs. Being eminently suitable for this particular purpose, it is much sought after and therefore commands a somewhat higher price.

The greater part of the Tasmanian osmiridium is undoubtedly used for this purpose, the remainder which is of unsuitable size and character, being treated in the refineries for the various metals.

#### Price of the Metal

The average local price gradually rose from £4 per ounce in 1910 to £38 in 1919 and 1920. From 1920 the price fluctuated between £20 and £30 per ounce, the largest price

being £32. 15. 0 per ounce at the end of 1925. During 1926 and 1927 the market declined to almost £10 per ounce but the present one is approximately £30 per ounce.

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