In other words, operating on the same ore with the same amount of nitre present, we may get different amounts of lead reduced, according as we vary either the character of the charge or the time of fusion.

In the presence of a sufficiency of sodium carbonate, sulphur, arsenic and antimony will be oxidized to sulphate, arseniate and antimoniate respectively, which will float as a watery liquid on the surface of the slag. From the foregoing it will be seen that too much reliance must not be placed on the preliminary assay as affording exact evidence upon which to calculate the nitre required in the final fusion. Due allowance must be made for differing conditions. Conditions must be such, during fusion, as to form the *lower* oxide of the metal which will then combine with the silica or borax added to the charge for this purpose.

The practice followed by the writer is to take ½ A. T. ore and to produce a lead button weighing from 20 to 25 grammes and certainly not less than 20 grammes. Sufficient silica is added to form monosilicates with bases present in the ore and sufficient bicarbonate of soda to form sulphate with all sulphur present, and also arseniate and antimoniate with any arsenic and antimony present: also some 15 grammes borax glass and 100 grammes litharge, together with the nitre which has been calculated to produce the requisite size of lead button. The charge having been thoroughly mixed a cover of raw borax is added, which melts extremely rapidly and prevents any loss from spitting, when oxidation of the sulphides takes place. The crucibles are placed in the furnace at a bright red heat, which is maintained only for a few minutes until the covers have thoroughly melted. The temperature is now lowered appreciably in order that the oxidation of the sulphides by the nitre may not be too vigorous. When bubbling has ceased, the temperature is again gradually raised until it approaches that of incipient whiteness at pouring. The total time occupied by fusion should not exceed some 40 minutes. A *very slow* fusion, at a low temperature, seems to promote the formation of peroxides of the heavy metals, which not only render the slag pasty, but also have an affinity for silver. *Too* rapid a fusion will likewise be of bad effect. Apart from losses which may occur from spitting, due to too vigorous oxidation of the sulphides by nitre, the sulphides tend to sink before they are thoroughly oxidized, and the button of lead may be sulphury. No undue amount of care is required to obtain by this method most consistent results, which will be found to be rather higher than those obtained by scorification.

The following table gives a comparison of results obtained by pot and scorification on different types of sulphides:

Type of Ores.	SILVER—OZS. (per ton.) BY POT ASSAY. Fusion with Carbon 1-10 A. T. Ore Taken.	Nitre Fusion ½ A. T. Ore Taken.	BY SCORIFICATION	Approximate Composition of Types
				TYPE A.—Concentrates
A.		108.0	108.2	Pb=18-25
		100.2	100.2	Zn 15-20
		98.5	97.8	Fe 16-20
		109.2	108.6	S 30
		91.6	90.8	As 2
				SiO_2 = 10
				TYPE B.—Concentrates
B.		115.4	115.4	Pb 30-35
		129.5	129 2	Zn=10-12
		136.0	135.2	Fe 18
	144.6	145.6	145.0	S 30
	125.7	125.8	125.6	As=2
	117.6	120.1	119.4	SiO_2 = 6-8
				TYPE C.—Ores
C.		269.0	268.5	Pb 45-55
		324.6	324.2	Zn=8-10
	272.5	274.9	274.5	Fe 9
	232.5	234.2	234.2	S=22
				SiO_2 - 7
				TYPE D.—Ores
D.	101.1	103.4	103.1	High grade galenas containing upwards of 80 Pb.
		142.2	141.5	
		144.4	143.3	

With regard to the foregoing table, it may be said that the procedure adopted, in making the various assays, is that which has already been described. The results are not those of individual assays, but have been most carefully checked.

In conclusion, it is not for a moment insisted that a nitre fusion, as followed by the writer, is the *only* good way of assaying sulphide ores of the Slocan type for silver. What is claimed for the method is that it is *one* good way, and, so far as accuracy goes, it certainly stands comparison with scorification.

A PORTABLE ELECTRIC MINING LAMP.

A PAPER presented recently before the British Institution of Mining Engineers described a small portable electric lamp which has been used for some time at the Bruay collieries, Pas-de-Calais. The lamp is known as the Neu-Catrice. It consists of a box of sheet lead containing two accumulator jars made of celluloid or semi-plastic india rubber. Each jar contains one positive and two negative plates, the two giving a mean voltage of 3.9, sufficient to supply a small incandescent lamp of about one candle-power for fifteen consecutive hours. The lamp is mounted on top of the lead case and is protected by a glass globe, one half of which is coated with a semi-translucent white varnish, which acts as a reflector and allows a small amount of light to be