

SUBJECTS FOR RESEARCH.

The list of suggested researches is as follows:—

I.—TIN AND TUNGSTEN.

TIN.

The study of the subject of the dressing of tin ores with a view to devising a cheap and effective method of recovering tin from slimes.

NOTE 1.—It may be pointed out that the Tin Research Committee of the Department of Scientific and Industrial Research is still in being, the Chairman of which, Mr. R. Arthur Thomas, will be glad to help.

NOTE 2.—The loss of tin in slimes, under existing methods, is very considerable.

TUNGSTEN.

1. Alloys of tungsten.

(a) The alloying of tungsten with other metals with special reference to the hardness of the alloys.

(b) The alloying of tungsten with nickel-aluminium, nickel-chromium and nickel-copper alloys, and the study of the effects of the presence of small quantities of other metals thereon.

(c) The investigation of the crystal structure of the hard alloys of tungsten, as, for instance, volomite, an alloy of tungsten (70 per cent.), chromium and cobalt. (See Note 1).

NOTE 1.—It is claimed that this alloy possesses nearly the hardness of the diamond with the toughness of steel. Experiments made with this and similar alloys have not been altogether successful in Great Britain. Research work might with advantage be carried out in regard to the production of such alloys and their heat treatment. Hard alloys of the character under consideration might be used in substitution for diamonds (Bort) in the drilling of boreholes. Such alloys, too, would be valuable for use in the making of end-bearings.

NOTE 2.—It has been ascertained that tungsten will not alloy with lead, silver, gold or mercury, but in respect of nickel-tungsten, cobalt-tungsten, platinum-tungsten alloys and alloys of the stellite series, considerable research work has been carried out. The alloys, too, of molybdenum-tungsten have been investigated, but are not likely to be of any value.

2. Chemical analysis.

A method of quick volumetric analysis for tungsten, which shall be moderately accurate and applicable to a works; also a reasonably quick method for the determination of the impurities in tungsten alloys, such as sulphur, phosphorus, and arsenic.

NOTE.—Mr. J. L. F. Vogel (a member of the Tin and Tungsten Committee and Managing Director of High Speed Steel Alloys Ltd.) has kindly offered to supply samples if necessary, as well as information concerning the subject. Mr. Hutchins of the School of Mines, Camborne, Cornwall, might also be consulted, he having done much investigation work in the direction alluded to.

3. Tungsten wire.

The possibility and practicability of coating tungsten wire with a metal or other substance to prevent oxidization of the tungsten when used in electric appliances.

II.—MISCELLANEOUS MINERALS.

1. ASBESTOS.

(a) The economic utilization of the extremely short fibrous waste produced at mines.

(b) The chemical analysis and comparison of the various forms of asbestos occurring within the Empire, and the specific uses to which these, respectively, can be put.

NOTE.—As to (b), Mr. Godfrey (a member of the Miscellaneous Mineral Committee and Manager of the Cape Asbestos Company) has kindly expressed a desire to be of assistance in this matter.

2. MICA.

(a) In connection with the electrical industry, to devise a quick method for determining the abrasive hardness of mica in its edgewise direction. The method might be either direct or indirect. Also a research to determine any definite relation that exists between face and edge hardness.

(b) To devise a commercial process by which mica can be ground sufficiently fine, and at the same time possess sufficient lustre, to satisfy the requirements of the wall paper trade.