

Indian hypothesis, I believe, has been accepted by others. In my opinion, the art of zinc-smelting originated neither in India nor in China, but in Persia. We noted from Ibn al-Faqīh that the zinc-mines of Kirmān were wrought in the tenth century; and the early Chinese references to *t'ou-ši* would warrant the conclusion that this industry was prominent under the Sasanians, and goes back at least to the sixth century.

Li Ši-čen¹ states that the green copper of Persia can be wrought into mirrors. I have no other information on this metal.

85. 鑛 or 鑛鐵 *pin t'ie*, *pin* iron, is mentioned as a product of Sasanian Persia,² also ascribed to Ki-pin (Kashmir).³ Mediæval authors like Č'añ Te mention it also for India and Hami.⁴ The *Ko ku yao lun*⁵ says that *pin t'ie* is produced by the Western Barbarians (Si Fan), and that its surface exhibits patterns like the winding lines of a conch or like sesame-seeds and snow. Swords and other implements made from this metal are polished by means of gold threads, and then these patterns become visible; the price of this metal exceeds that of silver. This clearly refers to a steel like that of Damascus, on which fine dark lines are produced by means of etching acids.⁶

Li Ši-čen⁷ states that *pin t'ie* is produced by the Western Barbarians (Si Fan), and cites the *Pao ts'añ lun* 寶藏論, by Hien Yüan-šu 軒轅述 of the tenth century, to the effect that there are five kinds of iron, one of these being *pin t'ie*, which is so hard and sharp that it can cut metal and hard stone. K'añ-hi's Dictionary states that *pin* is wrought into sharp swords. Previous investigators have overlooked the fact that this metal is first mentioned for Sasanian Persia, and have merely pointed to the late mediæval mention in the Sung Annals.⁸

The word *pin* has not yet been explained. Even the Pan-Turks have not yet discovered it in Turkish. It is connected with Iranian *spaina, Pamir languages *spin*, Afghan *ōspina* or *ōspana*, Ossetic *äfsän*.⁹ The

¹ *Pen ts'ao kañ mu*, Ch. 8, p. 3 b.

² *Čou šu*, Ch. 50, p. 6; *Sui šu*, Ch. 83, p. 7 b.

³ *T'ai p'ih hwan yü ki*, Ch. 182, p. 12 b.

⁴ BRETSCHNEIDER, *Mediæval Researches*, Vol. I, p. 146; *Kwañ yü ki*, Ch. 24, p. 5 b.

⁵ Ch. 6, p. 14 b (ed. of *Si yin hüan ts'un šu*).

⁶ A reference to *pin t'ie* occurs also in the *Šan kü sin hwa* 山居新話, written by Yañ Yü 楊瑀 in 1360 (p. 19, ed. of *Či pu tsu čai ts'un šu*).

⁷ *Pen ts'ao kañ mu*, Ch. 8, p. 11 b.

⁸ BRETSCHNEIDER, *On the Knowledge possessed by the Chinese of the Arabs*, p. 12, and *China Review*, Vol. V, p. 21; W. F. MAYERS, *China Review*, Vol. IV, p. 175.

⁹ HÜBSCHMANN, *Persische Studien*, p. 10.