Preface to the Special Issue on “Ancient and Pre-modern Production of Iron and Non-ferrous Metals and their Crafts”

Kazuhiro NAGATA*

Faculty of Fine Arts, Tokyo University of the Arts, Tokyo, 110-8714 Japan.

The human civilization have been developed with the metallurgy. The technology of copper smelting was developed in Anatolia or Iran probably as early as 6000 years ago. The Iron Age started at the beginning of 4000 years ago in Anatolia. The ideas and techniques of ironmaking diffused into Europe, Africa and Asia by about 500BC but not America. The theory of diffusion has been generally accepted by the archaeologists. However, as pointed by R. F. Tylecote in his book “History of Metallurgy”, it is possible that the appearance of smelted copper in South and Central America at the beginning of the first millennium AD is a case of independent development.

In Japan, the technology of copper and iron working came from China and Korea by about 4th BC. The technology of iron smelting introduced from Korea in the late of the 6th Century. Nara is the ancient capital of Japan and there are many historical and cultural attractions. The great bronze statue of Buddha (Daibutsu) in the Todaiji Temple was cast using ca.500 tonnes of copper in 747–749 AD and marks the beginning of the new age of the metal production in Japan. The traditional ironmaking, Tatara, in Japan has produced pig iron and special steel from fine iron sand. The special steel, Tama-hagane, is the materials to produce a beautiful Japanese sword.

The 8th conference of the Beginning of the Use of Metals and Alloys (BUMA8) was held and organized by Iron and Steel Institute of Japan from September 10 to 15, 2013 in Nara. This is the 2nd conference held in Japan followed by the 4th BUMA in Matsue, 1998. The BUMA was founded in 1981 by two eminent archeometallurgists of Professor Robert Maddin in Philadelphia USA and Professor Tsun Ko in Beijing, China, with the strong support of late Professors Cyril Stanley Smith (MIT, USA) and Yunoshin Imai (Tohoku University, Japan) from the second conference of BUMA. The conferences of BUMA has been held in Zhengzhou, China (1986), Sanmenxia, China (1992), Matsue, Japan (1998), Gyeyongju, Korea (2002), Beijing, China (2006) and Bangalore, India (2009).

The BUMA8 has 102 papers by 147 participants (16 accompanies) of scientists, engineers, archaeologists and historians of 39 from Japan, 15 China, 14 UK, 9 India, 5 USA, 4 Italy, 3 Korea, 2 Egypt, France, Germany, Thailand, Norway, Hungary, Australia, Russia, Bangladesh, Qatar and Taiwan from 18 countries. They gathered to make interdisciplinary discussions with a focus on production and use of metals, and an emphasis on cultural interactions and evolutions over time and space especially between the West and the Asian region.

The main theme in the Nara Conference was “Cultural Interaction and the Use of Metals”. The Conference provides 11 sessions in one room for discussion on the effects of metals to the culture and history with a special focus on Asian materials. Comparative studies and case studies on ancient and traditional metallurgy from other regions illuminated the interactions between the Far East and the West through South Asia as well as Eurasia. The sessions were composed of the early metal interaction, the ancient copper and bronze, the iron production in various regions, the iron sand smelting and refining, the non-ferrous metals, the silver and gold, the alloys (including bronze) and speiss, the iron artifacts, the bronze technology and conservation and the new technology of archeometallurgy. From these discussions, it was realized that the technology of smelting and manufacturing of metals in every area was locally developed with their deep relationships each other. The traditional ironmaking technology of Tatara using fine iron sand and the forge-and-welding technology to make Japanese sword are unique in the world.

The papers in the special issue on “Ancient and pre-modern production of iron and non-ferrous metals and their crafts” is selected from 58 excellent papers of the conference of BUMA8. We hope to develop the researches of the fields.

* Corresponding author: E-mail: nagata.k.aa@m.titech.ac.jp
DOI: http://dx.doi.org/10.2355/isijinternational.54.1001