

Influence of Nalanda Bronzes on the Art of Neighbouring Countries

Dilip Kumar¹

Bronze is technically known in Indian *Śilpa śāstra*¹ as *Acmadhātu* (an alloy of eight metals). Therefore N. K. Bhattasali² has also used the term octo-alloy for this combination of metals. In these bronzes, there are Copper, Tin, Lead, Antimony, Zinc, Iron, Gold and Silver in varying proportions. Copper is undoubtedly the chief component in this *Acmadhātu* and the proportion of last two Gold & Silver is almost insignificant except few Bronzes which are Gold gilt. These metal images became increasingly popular from the 8th century onwards.

Eastern School of the Pālas produced simultaneously with stone sculpture, remarkable series of which the principle centres were Nalanda and Kurkihar. As bronze is a more handy and pliable medium than stone and susceptible to more minute execution and precise definition, it was easy to transport from one place to another by the devotees and pilgrims. Elegance in form and richness in spiritual expression characterized the bronzes of Pāla period.

The metal images were cast by *cir-Perdue* or lost wax process³, so called as the subject was first modelled in wax and the model coated with clay, after the wax is melted out the liquid metal was poured into the mould. This was the technique employed in making all images of bronzes or brass. In this process the first stage of casting is the preparation of the wax model (*madhūcāicma vidhāna*). The object to be cast is first modelled in wax which is wrapped in a thick coating of soft clay mixed with cow dung applied in two or three layers. When sufficiently dry, a few more coating of clay with husk are applied over it. When dry again, the wax model is melted by the application of heat, which leaves a vacuum into which the molten amalgam are poured. After the amalgam is set and cooled, the clay mould is removed and the figure is chiselled in rough outline. Then the finishing touch is given later on. This very process is also referred to in the *Vishnu SaAhitā* as quoted by Gopinath Rao in his book. This method is quite suitable for solid casting and prevalent in South India and Sri Lanka.

However, a study of Nalanda Bronze clearly indicates that these images were cast in hallow, the inner core being stuffed with non metallic substance. What to say of Nalanda bronzes even the colossal copper Buddha from Sultanganj exhibits similar inner stuffing. It appears that the wax model was prepared over and round a stump or rough model of husk and other combination. The stuff remains within the mould even when the wax is melted. The molten amalgam drips in the crevices between the mould and the stump encasing the latter. The non – metallic substances, like husk in the stump, assumes a charred character blackish or reddish colour and sufficient hardness in the process of casting due to high temperature. This technique is known as *cir-Perdue* hallow casting.

¹ Research Scholar, Department of A. I. H. & Archaeology, Patna University, Patna, India.