STATEMENT - I

(Statement showing the particulars, on which the work is based, the discovery of new facts and of new relationships between the facts observed by others and how the work tends to help the general advancement of knowledge)

During the last decade various scholars have studied iron objects from other archaeological context, however very few scholars have studied them from the megalithic context. However Iron technology ascribed to the Painted Grey Ware culture in the Gangetic plain received considerable attention. In the megalithic context of Vidarbha surface archaeology received more attention with scholars engaging in assessing the massive stone circles and menhirs. However the fillings in the stone circles were merely recorded. However a few exceptions are also evident. The Naikund excavation report has an entire section dedicated to the Mossbauer Spectroscopy of the ore and slag excavated from the smelting site. This was a path breaking research and it was attempted for the first time in India by Gogte (1982). In the first half of the twenty first century Deshpande (2010), Park (2012) emphasised on the spectroscopic and metallographic studies however the socio-economic aspects have been overlooked. Whereas on the other hand Iron Age as a culture have been well studied by Deo (1985), Mohanty (2003a), Joshi (1993). These studies have tended to concentrate on one aspect of the culture and partly ignore either the scientific or the cultural aspect; therefore it lacks a holistic approach. Therefore no comparative investigation of the entire iron assemblage excavated from the Vidarbhan Megalithic sites have been attempted although this region has yielded substantial evidences of iron working and variety of iron objects domestic, agricultural and defensive. However it is important to note that the scientific investigations initiated by Gogte, Deshpande and Park have created a furore in the field of archaeological sciences. Techniques unknown in the field of archaeology were adopted to generate more data on Iron technology such as SEM, TEM etc. This has changed the nature of archaeology from being socio-cultural to scientific and analytical. Scientific inquiry was initiated by these scientific studies. However scientific inquiry alone would not shed light on the society that engaged in the ancient Iron technology. Therefore to

draw a bridge between scientific inquiry and cultural studies the method of New Archaeology is adopted.

This thesis attempts to overcome the abovementioned discrepancies and by adopting a scientific approach a thorough understanding of the prevalent metallurgical processes and the society that practised the art of iron smelting and iron smithery within the context of Early Iron Age megalithic society of Vidarbha. This study deals with the microscopic and chemical analysis of the iron objects so as to construct the method of working. Coupled with the microscopic data typological and morphometric analysis would aid in constructing the possible socio-economic significance of the metal and the society that produced the metal and manufactured the tools.

The results in this study have been derived at by analysing materials excavated from megalithic sites in Vidarbha. The entire array of iron assemblage from Naikund, Vyahad, Mahurjhari, Dhamna Linga, Dhaulameti, Khairwada, Borgaon, Bhagimohari were typologically and morphometrically analysed. Secondly they were systematically sampled and the samples were prepared for microscopic analysis so as to understand the smithery techniques and the percentage of carbon present in the samples.

This thesis provides us knowledge about the existing iron technology and the people who practised it.

1. Typological analysis revealed the varieties of implements that existed at Vidarbha during the Megalithic phase. Further based on the forms and functions by drawing parallels from the ethnographic context the assemblage can be divided into household objects, tools for agricultural purpose, defensive and offensive purpose.

2. Based on the function of the objects a wide range of activities undertaken by the megalithic society has come to light. Apart from the usual agricultural tools such as hoe and axe, we also have tools used for delicate purposes such as nail parers and adzes commonly known as *Rapi*. Probably they engaged in surgery and trappination. Along with these tools we have an increasing evidence of offensive tools like spike, dagger etc probably suggesting the introduction of sophisticated hunting tools or tools used for warring purpose.

3. The compositional analysis of the metal objects proved that iron smelting was in an advanced stage during the Megalithic phase and the megalithic society had achieved the want of smelting almost pure iron which is evidenced by the 97% Fe content.

4. The different techniques adopted for the manufacturing of different types of tools were identified. The choice of technique was done based on the functional need of the artefact. For ex., Quenching was not required for all tools as only the thin edged sharp ends had to be hardened by started cooling. The different techniques have been understood by the various micro-structures.

5. Evidence of steeling is found the sites of Mahurjhari, Bhagimohari and Vyhad suggesting that the Technology of Iron smithery reached its heights and had developed when the temperature could be controlled within the furnace and the knowledge of *carburisation* was evident.

6. The stages of development in techniques are evidenced from the zone of Vidarbha with objects manufactured using the casting technique finally leading to objects manufactured by the steeling technique. Suggesting the gradual advancement from brittle objects to sturdier and sharper objects.

7. The ethnographic work helped to understand the non-industrial smithery techniques. The layout of a smithery workshop the everyday activities and religious rites related to an iron smithery workshop. The ethnographic survey formed the basis to understand the relationship between a smither and other specialised section of the society like potter, farmer, well digger etc.

8. The ethnographic survey shed light on the contemporary Gondi community of Gadchiroli region who still erect menhirs and dolmens in memory of the dead soul, and till the mid 20^{th} century they practised non-industrial iron smelting and till date recycling and iron smithery is practised by them.