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).

A detailed scientific study of the representative Megalithic iron objects in order to understand their production technology has been attempted for the first time in the thesis. A few analytical and metallographic studies on ancient Indian iron objects carried out by Hegde, Gogte and Aggarwal are restricted to certain individual sites. A detailed technical study of Megalithic iron objects has not so far been carried out.

In order to reconstruct the various stages involved in the extraction of iron from ore and fabrication techniques adopted to produce useful objects, a detailed investigation of representative iron specimens of the Megalithic levels from Raipur, Gaudageri-Unachageri, Hallur, Komaranahalli, Hingai, Halingal, Uppalapadu Chinnamarur, Kadambapur is attempted in this thesis.

On the basis of the data obtained from the study, salient features of extraction of iron and fabrication techniques adopted to produce the Megalithic iron objects in peninsular India is reconstructed.
The thesis, therefore, adds a detailed information to our existing knowledge on the following aspects:

1. It indicates the probable sources of iron ores exploited by the Megalithic people.

2. It examines whether iron technology was an offshoot of copper metallurgy of the Chalcolithic period.

3. An attempt is made to compare the chalcolithic furnace with those of Megalithic period. The similarities among the furnaces are brought to light.

4. It has been observed that preservation of a few Megalithic iron objects in good condition was due to the formation of a thin film of rust-inhibitor.

5. The study has revealed that the Megalithic iron objects were made of wrought iron.

6. The study has also brought to light the type of heat treatment given to produce the iron objects.

7. Microscopic study of a few objects revealed the efficiency-level of the smith who produced them.

8. The study also throws light on the different smithery techniques, such as lamination, case-carburisation, steelling, quenching followed by the Megalithic people to produce the desired tools.
9. It indicates that a few objects were subjected to case-carburisation and a few made by using piling or lamination technique.

10. It was observed that some objects which were highly corroded, showed the presence of relic carbide, on the basis of which, reconstruction of smithery process is carried out.

11. An examination under microscope revealed the presence of surviving metal crystals within corroded layers of a few iron samples. The nature of heat-treatment given to such objects is inferred on the basis of surviving metal crystals.

12. Comparative study of the hardness values of the tools under reference was also carried out. The objects subjected to hardness tests showed different hardness values in coarse and fine grain areas, ferrite and pearlite regions, and carburised zones.