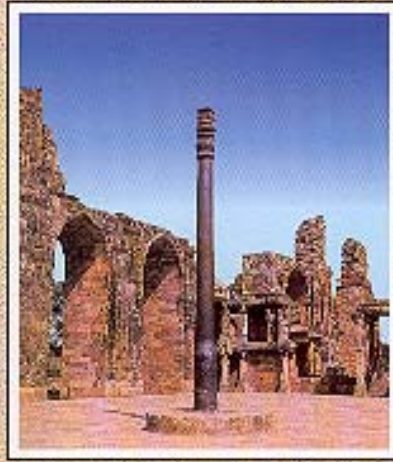


DELHI IRON PILLAR

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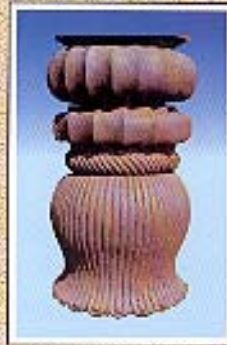
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# DELHI IRON PILLAR

NEW INSIGHTS

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## **DELHI IRON PILLAR: NEW INSIGHTS by R. Balasubramaniam**

The first chapter begins with a broad overview of the iron making processes in ancient India and emphasizes the iron of the Delhi pillar. The composition and microstructure of the Delhi pillar iron are discussed in detail. Finally, the origin of high phosphorus contents in the Delhi pillar iron, in particular, and in ancient Indian iron, in general, is addressed briefly in this chapter and in detail in Appendix A. The second chapter delves into the history of the iron pillar, where specific attention is focused on the oldest Sanskrit inscription on the pillar. The identity of *Chandra* provides firm dates for the construction of the pillar and hence fixes the age of the pillar. The identification of the original location of the pillar, *Vishnupadagiri*, sheds light on the environmental conditions faced by the pillar before it was moved to its current location at Delhi. A brief discussion is also provided for the history behind the movement of the pillar from its original location to its present location. The third chapter addresses the structural features of the pillar. A detailed dimensional analysis of the pillar is presented followed by a macroscopic description of the pillar starting from the buried underground regions. The changes in the burial level of the pillar are also addressed. The presence of lead at several locations in the pillar is described before concluding the chapter with a brief discussion on the status of lead metallurgy in ancient India. The fourth chapter describes the various components of the decorative bell capital and the fitting methodology. The fifth chapter elucidates the manufacturing methodology employed to construct the main body of the pillar. Scientific and visual evidence for the proposed methodology of manufacture is presented. The sixth chapter addresses the corrosion resistance of the pillar. A review of the corrosion resistance theories is first presented. The role of slag inclusions (entrapped in the main body of the iron) on the corrosion behavior is analyzed by the mixed potential theory. A detailed characterization of the oldest rust on the pillar is presented, and the process of formation of the protective passive film (which is responsible for the superior corrosion resistance of the pillar) is explained. The color of the growing rust on the pillar is also addressed before concluding the chapter with a discussion on the difference between the rusting of the Delhi pillar iron and mild/weathering steels. The final chapter summarizes the new insights that have been presented in the book. This chapter provides a brief overview of other large ancient iron objects, with a detailed discussion on the Dhar iron pillar. Future studies that need to be undertaken are proposed in each of these chapters.

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