Remarkable growth and diversification of industrialisation have taken place in India since independence. India now occupies the tenth position in the industrialized nations of the world. The development of metallurgical industries, heavy engineering industries, chemical process industries like fertilizers, pesticides, dye stuff, petrochemicals, plastics, synthetic fibres, etc. has given rise to new and complex problems of health hazards both for workers and the community at large.

India has an enviable reputation all over the world for its master craftsmen in metal work. Recent exploration of metallic minerals and production of metals has inspired various types of industries to develop in the country. Metal and metal-based industries account for 21% of the total number of industries in the country. 30% of the total industrial working population is employed in metallurgical industries.

Chromium, manganese, nickel, copper, zinc,
Cadmium and lead, either as such or in the form of their salts, are used widely in various industries in India. These metals because of their presence in traces in the human body, are known as 'trace metals'. Moreover, the density of these metals being above 4 g/cm³, they are also termed as 'Heavy metals'. The present work embodies the results of the studies carried out to evaluate the occupational exposure to these 'trace heavy metals'.

The first chapter is an introductory one; giving an account of the metals used in different industries; exposure risks; health effects; developments in the science of metallurgy and occupational health in India and a literature review on the subject. The second chapter deals with the methodologies for collection and preparation of the sample and determination of the levels of trace metals for the evaluation of human exposure to metals.

Chapters 3-8, are based on the experimental work done by the author. The third chapter pertains to the non-occupational exposure to trace heavy metals or community exposure. Chapter-4 is devoted primarily to manganese exposure of workers in a dry-
cell battery manufacturing unit, while chapter 5 details the worker exposure to lead in type foundries. The sixth chapter describes mult metal exposure to trace heavy metals in welding operations. Occupational exposure to trace heavy metals in ferrous and non-ferrous foundries, and ceramic glaze work, are discussed in chapter 7 and 8 respectively.

No Indian standard for the permissible concentration of trace metals in working air environment (TLV-values) have been adopted. Hence, the results of the present studies are discussed with reference to TLV (USA) and TAC (USSR) values. The conclusions drawn and the recommendations made are presented in the respective chapters for each type of industry.

The last chapter discusses conclusively the findings arising out of these studies and the recommendations sought to be made. Based on this information some general considerations for the prevention of occupational diseases in industry and some suggestions for future investigations are also outlined.

Among all pollutants, metals have an unique place in that they occur in the environment only in
traces, they are mostly nonbiodegradable and they are often highly toxic to man. Hence, the problem of health hazards to those exposed occupationally to metals deserves a serious thought. In fact, their threat to the common man has been realised only in the recent past.

Unfortunately, occupational health services are not adequate in this country and further sufficient attention to the industrial hygiene aspects has not been paid. It is, therefore, felt that such studies dealing with 'Metal' and 'Man' may fill the gaps in our knowledge on exposure to metals under Indian conditions.