STUDY OF MORTALITY OF WORKERS AT THE IRON AND STEEL INDUSTRY IN EGYPT DURING THE PERIOD FROM (1982–1986)

Thesis

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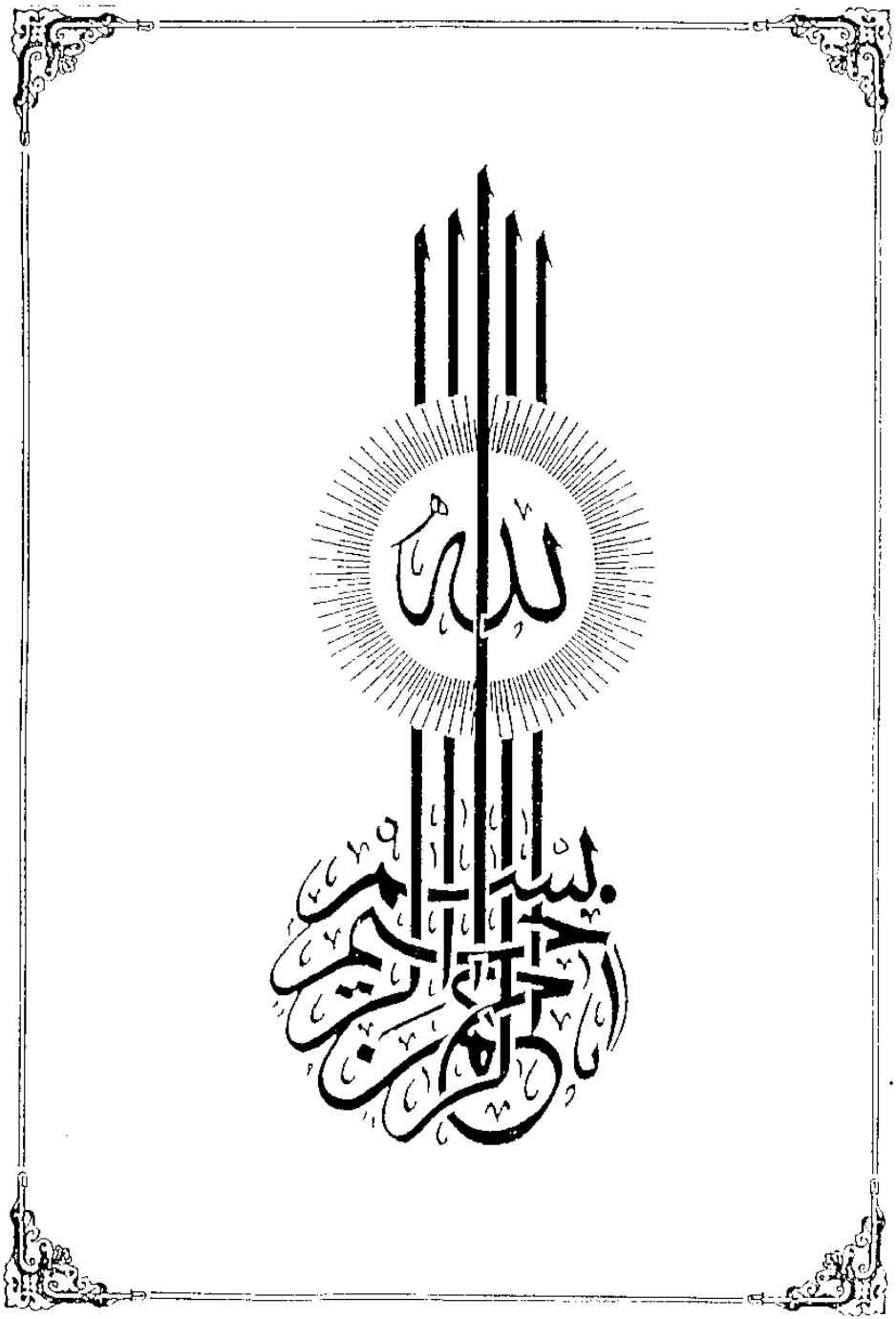

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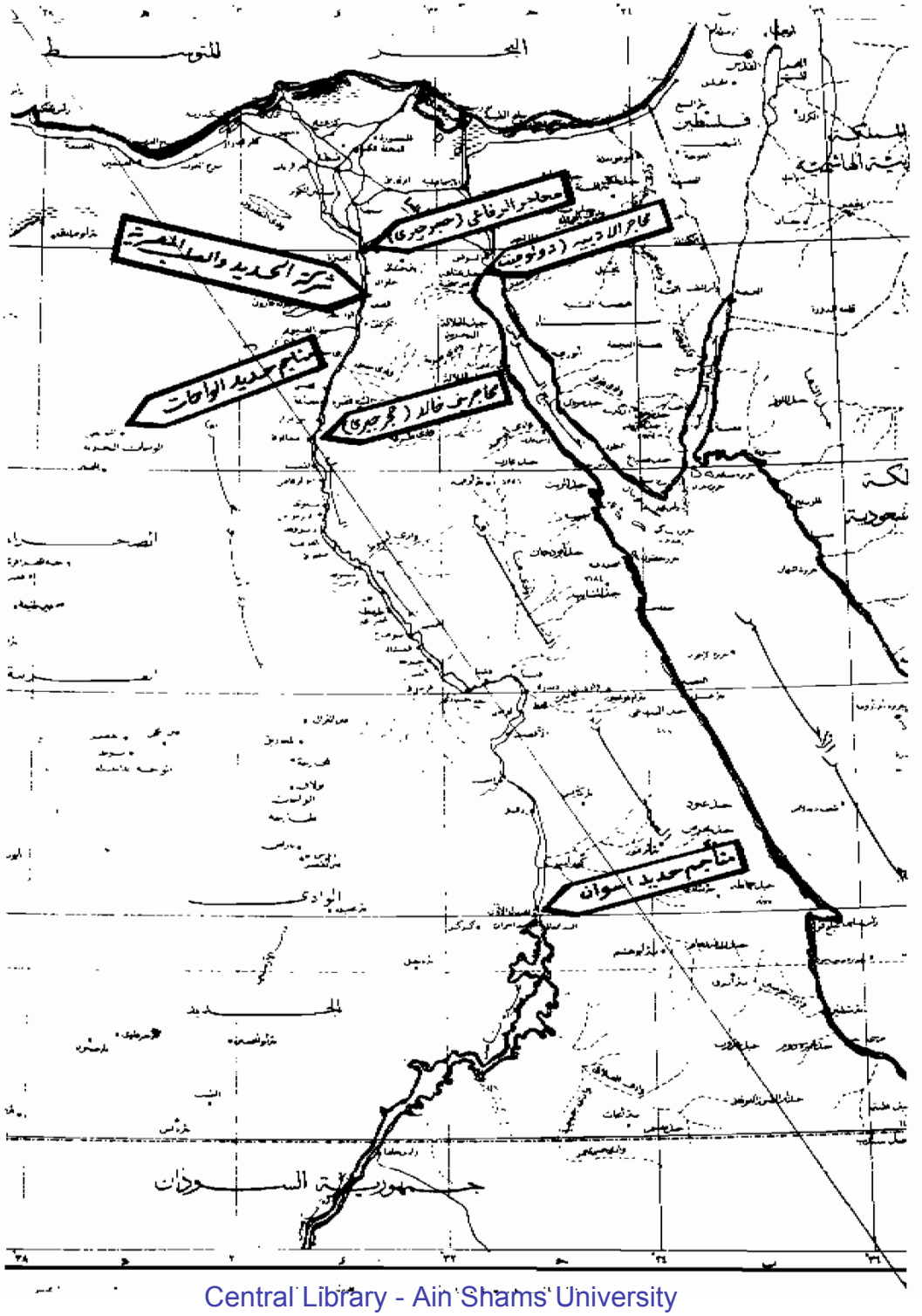
شركة الحديد والصلب المصرية ووحداتها من المناجم والمحاجر الممتدة على خريطة الجمهورية



INTRODUCTION

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Study of Mortality of Workers at the Iron and Steel Industry in Tebeen and Helwan, in Egypt during the Period 1982-1986

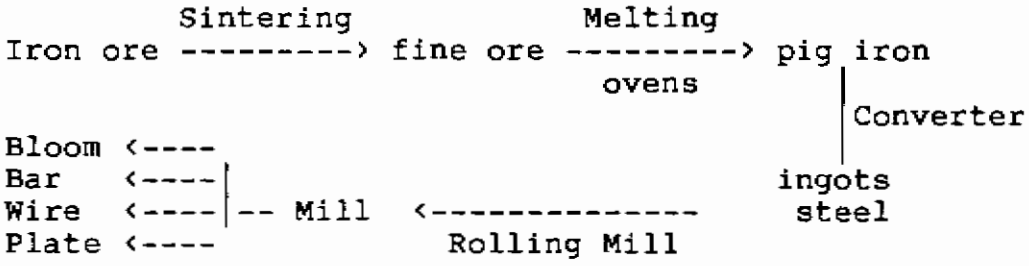
Iron and Steel is one of the heavy industries. The industrial process starts with the iron ore and ends with the production of different kinds of steel which are used in many aspects of life. The processes include several steps:

1- Sintering (talbeed) which is the process of preparing and purifying the iron ore.

2- Iron-making where the iron ore is melted to produce pig-iron under very high temperatures in high ovens (blast furnaces, open hearth furnaces, the converters and electric furnaces).

3- Steel making: where pig-iron is converted into highly elastic metal in converters, changed into molten steel and is poured into moulds, to form ingots which are stored and reheated before being shaped.

4- Rolling mills (Darfala): where ingots are rolled into shapes for the various products e.g. bar mills, wire mills, sheet mills and plate mills.



5- Other activities include mechanical and electrical power generators, storage, transportation and supportive services, (Swanston, 1950), (Encyclopedia, of Occupational Health and Safety, 1983).

Iron and Steel workers are exposed to many occupational health hazards such as carbon monoxide, silica dust and accidents which may occur due to explosion or due to mechanical causes. Workers are liable to develop chronic diseases such as ischaemic heart diseases, cerebro-vascular accidents due to work stress and neoplasms due to exposure to many carcinogens in the work place....etc. (IARC Monographs, 1984).

In 1962 an extensive mortality study on iron and steel workers in the U.S.A. was initiated by the U.S. Public Health Service which showed an excessive occurence of deaths due to arteriosclerotic and degenerative heart diseases, respiratory and infective diseases. (Lloyd and Ciocco, 1969). Since then several studies were done which have shown an excess of death among certain groups of steel workers. Excess deaths from

vascular lesions affecting the central nervous system were observed for employees in machine shops. There was also excess death from heart diseases which were observed for employees in mechanical power. (Lloyd et al., 1970). Other studies showed increased mortality among workers in open hearths (ovens) due to digestive and respiratory diseases which suggested that they may be related to exposure to iron oxide and other chemicals in the work environment (Redmond et al., 1975). In another study the cause-specific mortality of men employed in rolling mills (tin and sheet mill areas), iron and steel industry, U.S.A., was examined and showed increased deaths from cerebro-vascular accidents, ischaemic heart diseases, hypertension, cardiovascular-renal diseases and cancer. It was also suggested that there may be a relationship between the diseases and exposure to heat during the iron and steel manufacture. (Mazumdar and Redmond, 1975).

In Egypt, the heavy steel industry was established about thirty years ago with almost 22,000 employees by 1986. To our knowledge, occupational studies of health problems among such groups of workers were scarce and could not be found in the literature. The Iron and Steel Company in Tebeen, Helwan, is the major iron and steel industry in Egypt.

The company includes many departments: sintering (talbeed), the ovens (high ovens, cool ovens), the steel (darfala, rolling

mill, heat treat). Other deparments collectively called the non-oven departments include maintainance, Mechanical power, electrical power and machine shops. Transportation and storage is one of the major departments, it includes about three thousand employees, drivers and other. Employees who work in mining were excluded from the study as their medical and other related records were unavailable.

Employees at the company, similar to other workers at the iron and steel industries are exposed to many hazards such as accidents, ischaemic heart diseases and cerebro-vascular accidents as a result of work stress. Exposure to heat and toxic materials increases the risk of silicosis, carbon monoxide toxicity, respiratory and renal diseases among the employees.

Occupational studies can be based on mortality and/or morbidity data. Mortality data were preferred because ascertainment of death is easier and more accurate and may show the long-term effects on health.

This study examines the relationship between employment within specified areas of the steel industry and mortality from all causes during the period 1982-1986.

By comparing deaths observed among workers from each work area with the number of deaths predicted by the experience of the general steel workers population, those areas which have significantly high or low mortality are identified.

Studying occupational mortality can be carried out either through cohort analysis of mortality or through the Standardized Mortality Ratio (SMR). The SMR has been widely used for more than fifty years, frequently as the only summary statistic in occupational mortality studies. (Tsai et al., 1986). In this study the SMR. has been utilized to investigate mortality among steel workers.