MEDICAL IMPACT ASSESSMENT OF AIR POLLUTION ON CAIRO PUBLIC TRANSPORT DRIVERS

THESIS

Submitted for fulfilment of Degree of Doctor of Philosophy in Enviromental Sciences (Medical Department)

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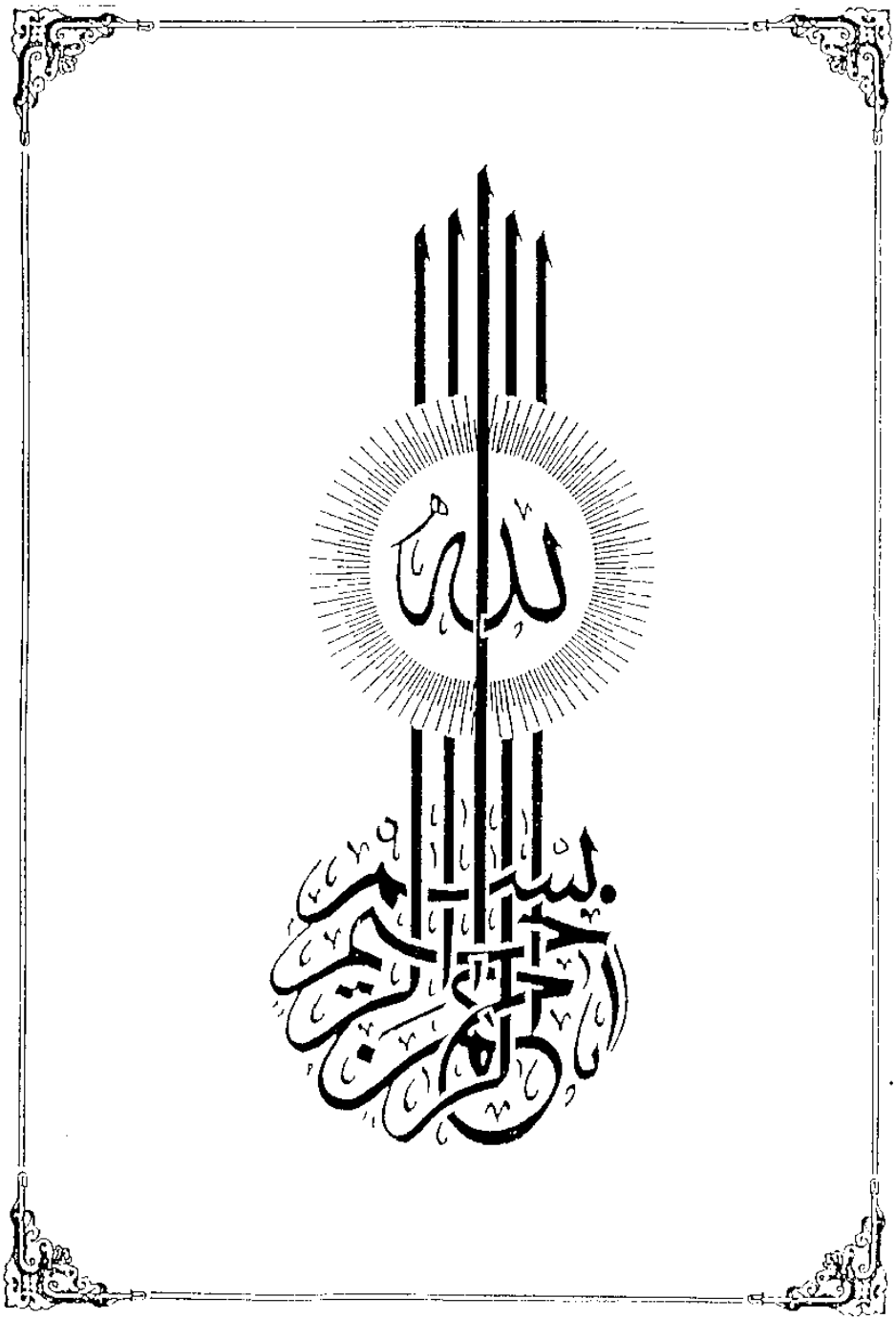

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List of Abbreviations

FEV1	Forced expiratory volume in the first second.
FVC	Forced vital capacity
MDA	Malondialdehyde
O^{-}_{2}	Superoxide anion
Pb	Lead
PVC	Perdected vital capacity
SOD	Superoxide dimutase enzyme

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Introduction and Aim of the Work

INTRODUCTION

High rates of dust deposition occur in Cairo, reaching values of 150 tonnes/sq.mile.month. In a commercial centre, the suspended particulate matter has an average of 61 ug/m^3/month; however a maximum of 523 ug/m^3/month was recorded. Concentration of smoke particles range from 72.4 ug/m^3/month in residential to 105.2 ug/m^3/month in industrial areas. Lead has values of 0.9 to 3,4 ug/m^3/month, being higher near the ground in the streets. Sulfur oxide has an average of 65 ug/m^3/month while carbon monoxide (CO) has values of 10.5 to 31.5 ppm at various heights above ground level. Nitrogen oxides (No_x) has an annual mean of 0.38 ppm. In the urban areas encountered in Greater Cairo, trace elements are more highly encountered on vegetation and soil **[Batanouny, 1988]**.

Since the establishment of Cairo on 7 July, 969 A.C. by the fatimide, the city has been expanding and its population increasing (Table I) **[Batanouny, 1988]**. Since the fifties, the city is suffering from rapid urbanization. The population of the city increased from 2079575 in 1947 to 5091000 in 1984 and 6921000 in 1993. Urbanization has been taking place through the non-planned physical expansion **[Batanouny, 1988]**.

Greater Cairo in the last three decades has been the site of numerous industries, especially in Helwan and Shoubra Al Khaimah areas **[Batanouny, 1988]**. The most striking features of urban life in developing countries are the contrasts. These are quite evident in Greater Cairo. These include :

a) Strong disparities in housing. In addition to the growth and spread of popular settlements, there are modern buildings with the best facilities.
b) Severe housing crisis. This has a significant effect on the socio-cultural environment.
c) Obvious differences in population structure and density.
d) High degree of social inequality.

e) The diversity of geographical, ethical and cultural origin of the town dwellers.
f) Random expansion of the city.
g) City expansion at the expense of the agricultural land.
h) Inadequacy of service, e.g. education, transportation and health care.
i) Employment crisis.
j) Severe pressure on the natural resources.
k) The drastic degradation of the environment especially the environmental problem of air pollution. All people breath polluted air. It is certain that these features, separate or together, have drastic consequences on all the living creatures **[Batanony, 1988]**.

Table (I) Population in the Cairo City over the period 1937 to 1993.

Year	Population
1937	1327266
1947	2079575
1960	3359701
1970	4572000
1976	5074016
1984	5091000
1986	6022000
1989	6399000
1990	6529000
1993	6921000

Data obtained from the statistical year books in different years.