PRENATAL DEVELOPMENT OF HUMAN COCHLEA

Thesis

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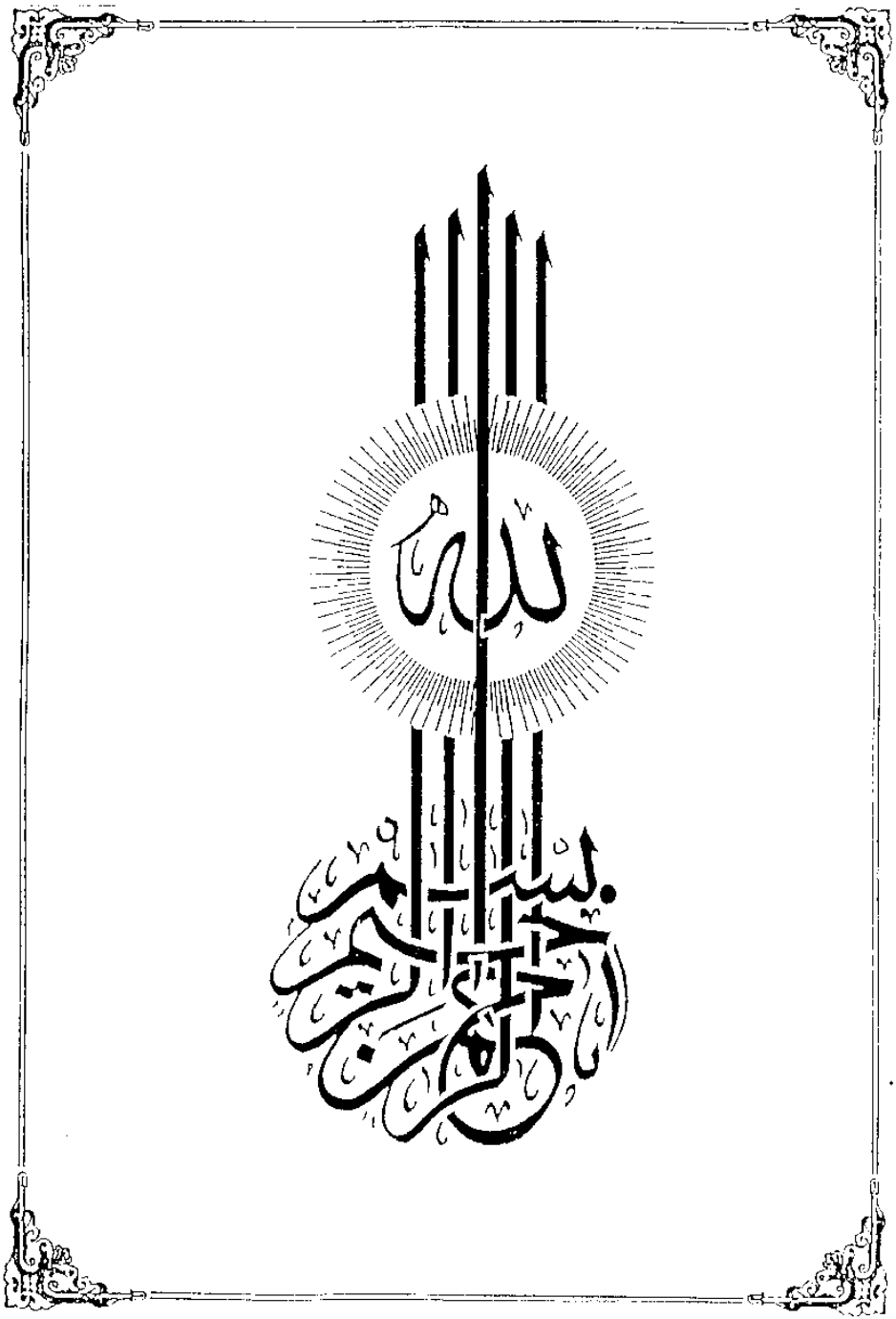

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LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION AND AIM OF THE WORK

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The ear forms one anatomical unite in the adult serving both hearing and equilibrium, however, in the embryo, it develops from three distinctly different parts; the external ear serves as the sound collecting organ, it develops from the first pharyngeal cleft (ectodermal in origin); the middle ear functions as a sound conductor from external to internal ear, it develops from the first pharyngeal pouch (endodermal in origin) and the internal ear converts sound waves into nerve impulses and registers changes in equilibrium, it develops from the surface ectoderm on each side of rhombencephalon ***(Sadler, 1995).***

Many investigators discussed the prenatal development of the cochlea in different animals. ***Weibel (1957)*** in mouse, ***Kikuchi and Hilding (1965)*** in mouse, ***Nakai and Hilding (1968)*** in rabbit, ***Sher (1971)*** in mouse, ***Pujol and Hilding (1973)*** in guinea pigs and cats, and ***Lenoir, Shnerson and Pujol (1980)*** in albino rat. However, scanty work dealt with the prenatal development of the human cochlea ***(Corti, 1851; Bast and Anson, 1949; Sanchez-Fernandez, Rivera and Macias, 1983; and Pujol and Lavigne-Rebillard, 1985).***

Corti (1851) provided the first description of the cytoarchitecture of the excitatory structure of the cochlea using a technique of microdissection. After which it had been termed the organ of Corti.

Bast and Anson (1949) gave the first complete light microscopic study of the gross morphology and the development of the sensory epithelium of the human cochlea.

O'Rahilly (1963) stated that, the first indication of the developing ear could be found in embryos of approximately 22 days as a thickening of the surface ectoderm called the otic placode on each side of the rhombencephalon (hindbrain).

Sanchez-Fernandez, Rivera and Macias (1983) mentioned that, the development of the human cochlea was the result of three coexisting processes; first, coiling and maturation of the cartilaginous otic capsule, second resorption of the periotic mesenchymal reticulum with the appearance of labyrinthin fluids and finally, the differentiation of the sensory epithelium into outer and inner hair cells. Some investigators studied the human fetal cochlea using scanning and transmission electron microscope ***(Igarashi, 1980; Pujol and Lavigne-Rebillard, 1992)*** and reported that, the maturation of the base preceded that of the apex by one or two weeks. Moreover, ***Sato, Sando and Takahashi (1991)*** studied postnatal development of the human cochlea and found that, there was lack of postnatal elongation of the cochlea indicating that the length of the human cochlea became close to its maximum during fetal life.