

# Index

Preface ..... 1

## CHAPTER I

<b>The beginnings of Greek scientific thinking</b> .....	<b>5</b>
Factors which allowed for the development of speculative thought .....	6
Greek philosophy and biology before the times of Aristotle; the archaic Greek world .....	7
The first schools of Greek philosophy .....	8
Ionic philosophers .....	12
Pythagoras and the Pythagoreans .....	14
The school of Elea .....	15
Other philosophers and scientists .....	16
The atomists .....	18
The Sophists .....	20
Socrates and Plato .....	20
Some general remarks .....	22
Early Greek medicine .....	22

## CHAPTER II

<b>Aristotle and Hellenistic biology</b> .....	<b>27</b>
The zenith of Greek biology .....	27
Hellenistic biology .....	48
The school of Alexandria .....	52

## CHAPTER III

<b>Roman times</b> .....	<b>55</b>
Rome and Hellenistic Greece .....	56
Didactic literature .....	58
Galen .....	64
Biology after Pliny .....	71
Gnosis, the irrational and Hellenistic sciences and the reasons of the stasis and subsequent decadence of culture .....	73

*CHAPTER IV*

<b>Early high schools and their relationship with the development of sciences and philosophy .....</b>	<b>77</b>
The significance of schools and teaching .....	78
Greek and Roman schools and schooling .....	78
Schooling in the Roman Empire .....	82
Early Medieval times .....	86
Higher education in Islamic countries .....	89
The birth of European universities .....	90

*APPENDIX TO CHAPTER IV*

<b>A section that may be useful in order to understand and evaluate several important problems as late as the 18th century, and I think, even contemporary debates .....</b>	<b>96</b>
On what is science .....	97
Later developments .....	101

*CHAPTER V*

<b>The Islamic culture and the Western world .....</b>	<b>111</b>
Islamic biology .....	111
Avicenna .....	117
Averroes .....	117
Other Muslim authors .....	119
Concluding remarks .....	120

*CHAPTER VI*

<b>Medieval times from the end of the Western Roman Empire to the end of the XV century .....</b>	<b>121</b>
Biology and medicine during the early Medieval times .....	122
Medicine before the flourishing of Universities .....	133
Late medieval medicine and its connection with universities and the early anatomical schools .....	136
The developments of biology in the late medieval and early renaissance times	142

*CHAPTER VII*

<b>The Renaissance .....</b>	<b>147</b>
The 16th century .....	147

Paracelsus .....	149
Vesalius and the reformation of anatomy .....	153
Contemporaries and followers of Vesalius .....	160
The renaissance of Botany and Zoology .....	165
The Renaissance problem with physiology .....	178
Harvey's predecessors .....	182
The fossils .....	184
The beginning of European world colonialism and the early zoological and botanical explorations .....	186
Medicine in the XVI century .....	188

### *CHAPTER VIII*

<b>The 17th Century .....</b>	<b>191</b>
Some general remarks on the XVII century .....	191
The scientific academies .....	196
Museums .....	202
The development of botanical and zoological systematics .....	206
The advances in physiology and anatomy during the 17th century: William Harvey .....	213
Other advances in Anatomy .....	219
Animal anatomy .....	222
The microscope opens new worlds .....	226
The debate on spontaneous generation .....	233
Physiology in the 17th century: The debate between 'Jatrochemists' and 'Jatromechanists' .....	238
The beginnings of Paleontology .....	246
The problem of contagion .....	248
Concluding remarks .....	249

### *Chapter IX*

<b>The 18th century before the french revolution .....</b>	<b>251</b>
Some general features of this period .....	251
Descriptive biology in the first half of the century .....	255
Linnaeus and his pupils .....	259
Banks and British explorations .....	269
Buffon and his school .....	270
Buffon's collaborators .....	276
Marine biology .....	279
The debate on spontaneous generation .....	281

Spallanzani .....	283
The debate on reproduction .....	287
Regeneration .....	295
The physiology of the 18th century .....	296
Circulation .....	301
Digestion .....	302
Respiration .....	303
The physiology of the nervous system .....	308
Morphology .....	313
Goethe .....	316
Vitalism and Mechanism .....	320
Forerunners of evolutionary ideas .....	325
The discovery of vaccination .....	327

#### *CHAPTER X*

<b>From the beginning of the french revolution to the publication of the Origin of species .....</b>	<b>329</b>
Some general features of this age .....	329
The ‘big three’ of the Muséum .....	333
«Naturphilosophie» and evolutionary theories .....	351
The Vestiges of Creation .....	356
The development of microscopes .....	357
Anatomy and Embryology .....	358
General biology: the development of histology and of the cell theory .....	364
Microbiology .....	369
Reproduction .....	370
Physiology .....	371
Descriptive zoology .....	374
Development and the discovery of life cycles .....	376
Descriptive botany .....	379
Exploration, Biogeography and the study of the sea .....	380
Palaeontology and geology .....	384

#### *Chapter XI*

<b>From the publication of the Origin of species to world war i .....</b>	<b>389</b>
General features of the age .....	389
Evolutionary ideas before Darwin .....	391
Charles Darwin .....	392
Basic principles of Darwin’s theory .....	396

Philosophic and religious reactions to Darwin's theory .....	397
Joseph Dalton Hooker .....	401
Thomas Henry Huxley (1825-1895) .....	401
Alfred Russel Wallace (1833-1913) .....	402
Henry Walter Bates .....	403
Darwin's critics .....	403
Morphology .....	416
Embryology .....	420
Animal systematic .....	428
The study of life cycles, of symbioses and of parasitology .....	429
Botany .....	431
Microbiology .....	433
Genetics .....	437
Biogeography .....	441
Ecology .....	442
Ethology .....	443
Palaeontology .....	444
Physiology .....	447
<b>Farewell .....</b>	<b>455</b>
<b>Some useful references books .....</b>	<b>457</b>
<b>Index of names .....</b>	<b>459</b>