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Velio Bocci

Only Women can avoid the Extinction of the Human Race

A Scientific Perspective



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**This book is dedicated to all human beings with the wish to find the
reason and the value of their existence**

PREFACE

During the last three years, often during the night, I thought that I ought to write this book but always postponed the idea because so much has been written regarding religions that my opinion may be naïve and useless. However, recently, many violent episodes compelled me to ask if religions, invented by humans, are really doing any good, because it is frightening to review the history of the last three thousands years during which both Religions and an infinite number of atrocities have taken place.

Although I am an agnostic, I have my own religion, which says simply because I have had the gift to be born, I must do something useful for justifying my existence. My education started off on the wrong foot because my beloved parents, having very limited possibilities, thought I should work as an accountant, a job that I would have hated. From age 7 to 11, I diligently frequented the church of the Mary's Servants and studied the Catechism so well to even win the prize (the so called Roman-prize) to be hosted in the Vatican City for a few days and to be blessed by the Pope, Pius XI. But, within one year, the Second World War started and I went to live most of the time in the country with my grandparents, who were peasants, where I started to appreciate their daily-life made of hard manual work and close relationship to Nature. In 1943, three events impressed me deeply: the likelihood that Italy was becoming a battleground compelled to build a shelter and the few men available decided to excavate a deep tunnel in the wooded hill nearby: deep in the centre, about 20 meters below the surface they found a number of beautiful fossil fishes in the virgin grey clay: I told this to Prof Norino Benacchio, my greatly esteemed Science teacher, who came to visit the site and explained that a few million of years ago, during the Pliocene, Tuscany had emerged from the sea with fishes remained trapped in the sediment. He was so enthusiastic and for the first time I heard that there was a continuous evolution of animal species. This was in contrast with what I had been taught about the Creation and I remained confused. After a few months I was shocked by his rapid death due to a diffused peritonitis after a perforated appendix. Shortly after I came to realize how our physical life was frail when Serena, a dear, gentle girl friend of my sister wasted away and died of a miliary tuberculosis because no medicine was available. As I have had the opportunity of reading the beautiful book entitled "Microbe Hunters" by Paul de Kruif, I could understand the fantastic endeavour of Pasteur, Koch and many other microbiologists fighting terrible diseases such as diphtheria, tetanus and tuberculosis against which medicine had been impotent.

The war in Tuscany was dreadful because in retaliation to partisan's attack, the German SS squads beastly murdered more than 2,400 hostages, most of which were old men, women and children. At the same time young Italian Fascists fought against Italian partisans. The ordinary troops of the German Wermacht, although exhausted and demoralized, continued to fight and delay the much desired arrival

of the Allied Army. The day after the Germans had retreated, Moroccans soldiers of the French Army came in our field and collected the bodies of two German soldiers: they were thrown on the back of a Jeep as if they were sacs of rubbish and I wondered if their relatives will ever have known of their end. The total toll of six years world war was some 55 million dead and everyone thought that humans would never wage another war!

In 1947 I was qualified as an accountant but I was very unhappy. Thus, with my parent's support, I decided to study on my own during the year to undergo the final exams at the Scientific Lyceum to be allowed to enter the Medical school. I was very lucky because the professor of Latin, during the final examination, although realized that I had not learnt enough Latin in a too short while, trusted me so that I could start studying medicine in October 1948, a step that I considered crucial even today.

During the first two years, I made an impressive number of dissections of human bodies and I started to understand the complexity and beauty of Physiology. In the meantime I wondered if all the Church's rituals were necessary and I did not feel like serving the Mass any longer. Moreover, the idea to confess my thoughts and mistakes to a priest so that I could free my conscience by saying a certain number of prayers bewildered me and I decided to abandon the Church. Nonetheless, whenever I could, I have visited many beautiful churches and Temples in the world and always I admired and respected the faith of those who, with great sacrifices, considered important to build them. Just think that in Siena, my little town, there are as many as 32 churches! In 1954, after the medical graduation, I worked for one year in the surgical department and then I was awarded a fellowship for working in the huge sanatorium in Rome, named to Carlo Forlanini, the inventor of the pneumothorax. By that time, with the advent of streptomycin and isoniazid, tuberculosis, that had killed Serena, could be cured or stabilized and it was no longer an exciting disease. However talking and helping patients was always rewarding but, by 1957, I had dedicated most of the time to biomedical researches in several institutions, either in my town University, or in England, in the States and, for brief periods, in Germany and Sweden.

The contacts with many scientists and the biomedical research work have certainly influenced my thinking because if you make a hypothesis, you have to either prove or disprove it experimentally. It can be very exciting as well as distressing but one learns to dislike and challenge dogmas. Doing scientific research is so entertaining that you could work all day long and, if necessary, on Sunday too! I have often noticed that, even during the night, our brain continues to elaborate ideas, which were irresolvable in the evening, become clear next morning. Whenever I had time, I was fascinated by reading what anthropologists, palaeontologists, astronomers have, with great effort, discovered in the last 55 years. In relation to the time of our planet, the main intuitions and discoveries have been made only very recently. It

has been a great fortune to live after Galileo, Newton, Lavoisier, Darwin, Einstein, Hubble, Leakey, Crick and Watson, because they have tried to understand how life develops on Earth and what is the significance of our planet in the Universe. I am filled with wonder at the marvels of nature and the long treacherous journey of humans throughout many thousands of years. As the brain volume and intellectual capacity of humans slowly grew and developed, the fear of death, the sorrow for the dead, the worry for a possible afterlife have been progressively mounting and elicited the strong need of having a protection from something whose nature was imagined to be essential, indestructible and eternal. When, even superficially, I examined the number of Religions proposed during the last 7,000 years, I was overwhelmed by their varieties, but obviously the need for a supernatural and merciful God became stringent as poverty, greed, misfortunes, meanness, competition and arrogance started to prevail over justice and equality among the early humans. From Mesopotamia to the Far East, from Egypt to Crete, Greece and Etruria, great civilizations flourished with an increasing number of Prophets, who said to have received divine commandments for improving mankind's life. I have no doubt about the existence and sacrifices of Jesus Christ, Mahomet, Buddha and I have I great respect for what they have tried to do. The profound ethnic differences of the various populations can explain some substantial differences among their teaching because each Prophet tried to present the most suitable rules for his own people. While I do appreciate the correctness of their rules, I cannot believe their fundamental assumptions and dogmas.

Why then have I decided to write this book and frankly expose my point of view! Why Christianity, Islamism, Hinduism, Buddhism and many other minor (only because followed by a lower number of people) Religions have taken root throughout the last 3,000 years and why today are still so important? Surprisingly, the prediction that an increased education, mainly in more developed countries, would have been accompanied by a significant decrease of a religious interest does not appear always correct, probably for technical, superstitious or mystical reasons. I would say that those who have faith in one or another religion do not need to read this book because probably they will not change their opinion. The book may be equally useless to those who firmly believe in Creationism or in the Intelligent Design, because for them any other idea, even supported by scientific evidence, is wrong or false. So, to whom is this book addressed? I feel that there are many human beings who, since their birth have been automatically included in a Religion, either do not worry or think about the religion, the reason of their existence and what may be their final fate. I have been told that there are also many people who, after trying to read books by theologians and philosophers, get discontented owing to their aulic but often incomprehensive prose. Moreover many other people go to Church only in special occasions or because they think that they have to follow the majority. It is unavoidable that either for a disease or the death

of a relative, even the most callous individual, has to reckon about the value of her/his existence and to what will happen as life approaches the end.

Hopefully, my experience and the evolution of my thoughts and of my own simple religion gained during the last sixty years may be of some help.

Although English is not my mother language, I wrote the book in English because this language has become the Latin of modern time and therefore the book may be read by people in many countries. It has been difficult to find the most appropriate title. The first one was: "Are Religions necessary for Mankind"? Then, after several discussions with a few friends, the next proposed titles are: "Mankind at a Crossroad" or perhaps better: "Only Women can avoid the Extinction of the Human Race. A scientific perspective"

Velio Bocci

ACKNOWLEDGEMENTS

It has taken some time to write this book because I had to use only spare time and week-ends while I continued to evaluate the validity of an integrative medical approach, which, in spite of the scepticism and prejudice of orthodox medicine, may become useful for many people, especially in poor countries.

Firstly I would like to acknowledge the trust and the teaching of my late parents. I am deeply grateful to my wife Helen for her patience and understanding of my urge to write this book. She also read the first draft and corrected many little mistakes that I continue to do. I would like to acknowledge very useful exchange of ideas regarding the woman's brain with Prof. Anna Maria Aloisi also working in the Department of Physiology. I also thank Prof. Luana Ricci Paulesu for reading the final draft and her kindness in writing the foreword and Prof. Valter Travagli of the Department of Pharmaceutical Chemistry and Technology for continuous encouragement and valuable technical help. Finally the help of Dr Carlo Aldinucci in precisely formatting the manuscript has been invaluable. Last but not least, I would like to thank Dr Gioacchino Onorati (Aracne Editrice S.r.l., Rome, Italy) for the excellent publication.

FOREWORD

As a scientist and a profound believer, I read Prof. Velio Bocci's book with much interest, since today, more than ever, the goals of science raise ethical problems and instil doubts and uncertainties in researchers who believe in God concerning the limits or lack of limits in their scientific fields.

I have known Velio since 1974, when I began my career as a researcher in his laboratory at the Department of Physiology, University of Siena. During all these years, I have had the opportunity to appreciate his qualities as a scholar who investigates scientific problems while maintaining an open mind to all hypotheses. In the past few years, I have had many discussions with Velio on ethical questions that are the subject of public debate in Italy and in the rest of the world, such as abortion and in vitro fertilization. Since I know that Velio is an agnostic, I have often been surprised to find that we agree on many of these topics.

In this book, Velio explores his perceptions of religions and analyzes the dogmatic foundations on which religions stand, using arguments based on solid scientific principles. To those who did not already know Velio, the book reveals his vast knowledge, which extends far beyond what he has acquired from his biomedical education and his career as a researcher. He delves deeply into the Natural Sciences and the Humanistic Sciences, dealing with important and difficult topics like the Origin of the Universe, Human Evolution and historical subjects concerning the origin and development of religions.

In his broad discourse, he never bores the reader; the topics are interconnected and ordered in a sequence that continually induces curiosity and the desire to learn more.

Nevertheless, as a believer, I cannot agree with the conclusions of Velio's analysis. God is a supreme being, not demonstrable by man by any of the means at his disposal. Indeed, if man could demonstrate God, we would have the definitive proof that God does not exist. Man, and thus the researcher, can only observe the scientific principles and natural laws that control the existence of living beings and then either recognize or not recognize the design of an abstract, non-material being. As a researcher and a believer, I have often gone by the words of St. Augustine, "Intellege ut credas, crede ut intellegas": "Understand so that you may believe. Believe so that you may understand".

No human intelligence or science can demonstrate the existence of God, since He is a supreme, unattainable being. Only faith can reveal God's existence, and it is not even comprehensible why some men possess faith and others do not.

Therefore, I distance myself from the concepts contained in the book, such as the denial of the immortality of the soul and the lack of the afterlife. Nevertheless, the fact that a physiologist who has devoted his life to scientific research has decided to tackle a subject of this kind, undoubtedly employing much

time and devotion, is a demonstration that at a certain point in one's life such questions can become so important as to necessitate answers.

Concerning the age-old debate about the relationship between science and religion, Velio's book has the merit of demonstrating that there is no need for a conflict between them.

Finally, I would like to emphasize an interesting aspect of the book regarding the differences between the male and female brain, which postulates that yielding more power to women might help reduce the conflicts in the modern world. Because of motherhood, women are biologically adapted to give life, to accept and tolerate the differences between individuals, beginning from pregnancy during which the mother and foetus co-exist, even though genetically different, for nine months. I feel that this postulate is the most original idea of the book and it will be interesting to see if it turns out to be true.

On the whole, I am certain that even though Velio's analysis has led to conclusions that are extraneous to the believer's way of thinking, it will still be useful for anyone who wishes to meditate on the meaning of man and of his existence on Earth.

Luana Ricci Paulesu, Professor of Physiology at the University of Siena, Italy

Siena, June 5th 2007

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PART ONE

Chapter 1

PROLOGUE

Regarding the approximate number of people associated with Religions, Table I summarizes the main data. It is likely that a variable and uncertain percentage is not practising.

TABLE I - *Number of people associated with Religions*

Christianity, including Catholic, Protestant, Eastern Orthodox, Pentecostal, Anglican, Evangelical, Quakers, Jehovah's Witnesses, etc	2.1 billion (~33%).
Islam, including Shiite, Sunni, etc:	1.3 billion (~21%).
Hinduism:	900 million (~14%).
Buddhism:	379 million (~6%).
Primal-indigenous:	300 million (~5%).
Sikhism (Punjab, India)	23 million (~0.36%).
Judaism:	12-17 million (~0.22%).
Nonreligious, Atheist, Agnostic and Secular.	About 1.1 billion people (~16%)

It appears probable that about ¼ of the world population does not believe in God or is minimally interested. I am neither a physicist, nor a philosopher or a theologian but only a physiologist and clinical scientist and, having been taught for several years the Catholic doctrine only, I have a superficial knowledge of the other Religions, one of which, Buddhism, is partly appealing to me. To become knowledgeable in other Religions, it will take an entire life-time and therefore I will limit my critical comments mainly to the Roman Catholic Religion. We shall see that to scientifically demonstrate God's existence is impossible and, so far, it has been also very difficult for the dedicated Templeton Foundation. Many distinguished experts of this topic, namely John Polkinghorne, Daniel Dennett, Keith Ward, J. Wentzel van Huyssteen, Owen Gingerich and Francis Collins are trying to find a connection between science and faith whereas an open discussion between Simon Conway Morris and Richard Dawkins has led nowhere (Wertheim, 1999). Lewis Wolpert has rightly written that "reason will never triumph over superstition". Thus, in spite of many attempts, it appears that Science and Religion live in different regions of the brain and it is presumptuous to challenge the faith of a true believer.

Firstly, I would try to develop a logical sequence of events from the creation of the Universe comparing the proposal of Christianity with the Big Bang theory. It will become apparent the unbridgeable difference concerning the development of life on our planet and the discrepancy between the creation of Adam and Eve by God versus the slow evolution of Hominids before reaching the modern stage of Homo sapiens. It will become clear why humans, during the last 40,000 years, have been able to communicate with a language, why they started to be creative and artistic and why they developed a strong feeling and a need of one God or more Deities. However the relevant modern religions have been created in a relatively short time period between 500 B.C. and 620 A.D. on the basis of enunciations of previous great prophets such as Abraham, the Muslims', Jews' and Christians' father (1812-1637 B.C.) and Moses, who is universally known for having received in the Sinai mountain the ten Commandments from God (~1600-1400 B.C.). Certainly during that period, the living conditions had markedly improved, thanks to a well-established agriculture and animal domestication. It will become impellent to ask: why so many Religions? Is there one better than another? And why they started to clash for dominance? A few reflections on the significant interactions among religions with political, military and economical situations will be made.

Owing to an early and heavy imprinting with the Roman Catholic Religion, I confess to feel uncomfortable in making critical comments about this Religion and why dogmatic statements are unsustainable will be clarified. On the basis of my medical and physiological knowledge, spanning 52 years (actually less than a nanosecond time in comparison to the time of the Universe!), on the basis of sound scientific data, it will be explained how the human consciousness and the finite existence of the soul have been objectively interpreted. While we know that the world population in 2006 was about 6.5 billion people, it seems unbelievable that only during the last 50,000 years, not less than about 100 billion people have passed away (Haub, 2002). Where has this immense number of human bodies gone? The hypothesis or affirmation of a body resuscitation or reincarnation of the soul, proposed by either Christianity or Buddhist Religion, will be dismissed because the after-life after death is only a dream of the believers. However human bodies, either after undergoing putrefaction or cremation, generate basic chemical compounds plus water and gases (methane, hydrogen disulfide, carbon dioxide, etc) that, at different extent and times, re-enter in the dynamic and continuous recycling of the fundamental components of the Universe. **Nothing is destroyed and everything is constantly recycled in the Universe.**

The territorial expansion of Christianity was harassed by the Roman Empire before the conversion of Constantine in A.D. 313. And yet, even when Christianity had become the official religion of the Roman Empire in A.D. 392, progress has been slow and difficult, finally arriving at the East-West church schism in A.D. 1054 establishing the division of the Roman Catholic Church from the Eastern Catholic Church. Successively the Crusades (A.D. 1095-1272), the Protestant revolution

(A.D. 1517), the intransigence of the Inquisition until the eighteenth century and the more recent scientific progress with new technologies have represented other difficult events for Christianity.

Some 2,000 years after the birth of Christ, we have evidence of how the earth originated, life was formed and how hominids progressed to become *Homo sapiens*. A variety of well-proven scientific data neither agree with the prophets' predications, nor with the preaching of the Gospels. I hate to be a killjoy but all the Christian dogmas appear to me as fantastic inventions void of any realistic and demonstrable value. Christ's sufferance calls for my deepest respect but I am obliged to explain why, on the basis of my biomedical knowledge, I dispute His resurrection which, after all, is based only on what the New Testament has reported. I shall discuss why all the intellectual functions and spiritual expression ceases a few minutes after death, but to comfort the believers in the Resurrection of the body, I will clarify with proven scientific data, the real fate of the body. Only thanks to the scientific discoveries made from Galileo's time to the recent definition of the human genome, it has been possible to objectively evaluate the transitory existence and the value of human beings. Needless to say that in their times, the great Prophets, having neither scientific knowledge nor any information, could only deliver information received from God while, supposedly, in a trance. This does not imply that true believers should give up their fate and nobody can deny their right to believe in God. Similarly, they cannot impose us their belief. Those, who are uncertain or do not believe should not despair because, by spending their lives honestly and in harmony with other people, they do not need to desire any ephemeral afterlife in an inexistent Paradise. If one can accept this simple idea she/he can construct her/his self-regulated religion and fully justify the value of her/his existence.

Today, in spite of religions, there are so many iniquities on earth, not to mention that more than one billion humans are hungry, thirsty, plagued by illnesses and unable to express their minds. Thus, instead of crying over an unfair world, we should try to change and improve it. I am sure that if this could become a sincere and generalized aim, we will find here the dreamed Paradise. I will need to discuss this extremely important point in more detail and if the proposed solutions will be adopted, they could represent a breakthrough. I don't want to be pessimistic but I am not sure that we will be able to improve the human condition because history abundantly shows how humans, although potentially are the most intelligent creatures, continue to behave very stupidly.

The reader can trust me if I say that I will strive to provide all the most scientifically valid and proven information. Only when absolutely necessary I will specify if some postulates are hypothetical and if it will be possible to demonstrate their validity or insubstantiality in the near future.

Chapter 2

THE BEGINNING AND EVOLUTION OF THE UNIVERSE

“In the beginning God created the heavens and the earth” (Genesis 1:1) and the creation has been supposed to have occurred recently, around 10-20,000 years ago. It is uncertain if it was done in a week or a month but, thanks to God’s omnipotence, the timing appears irrelevant. And in John (1:1) “In the beginning was the Word, and the Word was with God, and the Word was God”. These solemn expressions sound beautiful but contrast with the abundant experimental, albeit incomplete, evidence provided by astronomers and astrophysicists since the 1920s. More precisely, in 1965, Arno Penzias and Robert Wilson accidentally discovered the presence of cosmic-microwave background radiation, which represents the leftover glow from the Big Bang. This picturesque nickname signals the birth of the universe, which happened about 14 billion years ago when a primordial, inert and minute nugget, endowed with a prodigious weight and a terrific high density, burst into existence and generated all the matter and energy that, after numerous violent events, has become the actual universe (Singh, 2005).

Since 2000, several scientists, by using a powerful new atom smasher, called the Relativistic Heavy Ion Collider, at Brookhaven National Laboratory on Long Islands (Wolfs, 2001; Ludlam and McLerran, 2003), have been able to simulate what happened during the first few microseconds of the Big Bang. Given the purpose of this book, it would be wrong to bother the reader with the complexity of the reactions happening in the first 10 microseconds, when quarks are bound into protons and neutrons at an initial temperature 100,000 times hotter than the Sun’s core. During the next 100 seconds, helium and other elements form from hydrogen and the temperature dropped down to 1 billion °C. The explosion of the most potent hydrogen bombs or of millions tons of TNT may only give a very faint idea of the Big Bang and obviously one immediately wonders who has provided the original nugget and who pulled the trigger. One hypothesis is that a preceding universe recycled back until reaching a super contracted state able to automatically reignite a new Big Bang. This is not a satisfactory answer because it proposes the old dilemma if the egg comes before the hen or vice versa. It can also be hypothesized that a “supernatural force” (God, if you wish) may have been responsible for this initial cosmic firework that, once started, would evolve through random selection as it is doing today. Lineweaver and Tavis (2005) suggested that the “Big Bang” was rather an explosion of space itself, tending to clarify what has happened in the following billions years in terms of a continuous expansion.

After about 300,000 years, the new universe has been imagined to still be a mini-newborn cloud of hot, dense gas, glowing white but with a much lower temperature

of around 2,700 °C. During the following 700,000 years, the material formed by neutral atoms tended to condensate progressively into a first generation of stars and young galaxies. A very useful revealing by-product has been the release of the cosmic microwave background radiation that has shown to be the crucial indicator of the growth of the primordial universe. However it has taken as many as 4 billion years before most stars were formed and another 5 billion years (9 billion from the very start!) before the Sun and thereafter the Earth were born. Since the birth of the Solar system, which represents an infinitesimal part of the universe, another 4.7 billion years elapsed for a total of at least 13.7 billion years from the Big Bang. It is understood that 100,000 million years more or less have no significance. The universe is seen as an extremely dynamic complex of billions and billions of various celestial bodies in different phases of development: we have been lucky to live in this time because the famous Hubble space telescope, by rotating in a exospheric orbit at 575 kilometres above the Earth surface, probes the cosmos and sends us back fantastic images of galaxies, star formation and nebulae that we could never have imagined. Galaxies seems to consist mostly of “dark matter” an apparently invisible and as yet unidentified type of material which, in due time, can give origin to new stars.

Everybody knows that all star constellations and planets move at fantastic speeds along precisely predicted paths but when, in a clear night, we gaze the firmament, that is always an enchanting experience, it seems that all the celestial bodies are resting and still. This stillness is quite deceptive because, the cosmos, almost 14 billion years old, has reached a midlife (Barger, 2005). Astronomers, with their last generation of telescopes, are still detecting violent activities in distant galaxies (about 60 light-years away) certainly invisible to the eye. Moreover in 1924, Edwin Hubble made the fundamental discovery that the universe was expanding, thus definitively closing a long dispute between astronomers, who have suggested either a possible deceleration or a contraction that would have made possible a “Big Crunch”. Today a new discovery made in 1998 by Brian Schmidt and Saul Perlmutter has clarified that the universe expands at an accelerating rate: this unexpected phenomenon has been interpreted as due to the “dark energy” that is a form of energy present in space with a strong negative pressure or, in other words, an antigravity force that causes a progressive estrangement of the galaxies from the cosmic horizon (Conselice, 2007). Even Einstein was delighted to learn from Edwin Hubble that this was really happening because he considered a blunder the prediction of a static universe and the need for introducing in his equation of relativity the “cosmological constant”. If the expansion trend will continue, within a few billion years from now, the universe will enter the senescent phase: it will get darker and darker and stars and galaxies, after having consumed most of their fuel, will become dead entities.

Like all scientific adventures, the actual model was borne out thanks to the contributions of thousands of dedicated scientists, to whom we owe gratitude even though, in spite of many converging results supporting the model, it will need to be perfected during the next decade with the advent of far more potent telescopes (Gilmuzzi, 2006). We surely will not be here during the dawn of the universe but it is hoped that new discoveries regarding the voracious black holes, the evolution of galaxies and the enigma of early quasars will be accomplished (Tucker et al., 2007). The present formulation of the universe, even if imperfect, is far more realistic and credible than the prescribed God static creation described in the sacred texts. The findings that the universe, after a thunderous birth and several turbulent phases, has grown into billions of stars which live, die and disappears into black holes renders it a living dynamic entity which, to me, resembles, albeit in an infinitely minimal scale, the birth, growth and ageing of the human body where also everyday millions of cells die and are continuously regenerated until the pace of proliferation slows down and death ensues.

Chapter 3

THE BIRTH OF THE EARTH AND THE TURBULENT PHASES BEFORE BECOMING A LIVEABLE PLANET

As far as it can be summarized from the Genesis (1:6-8; 1:9-13; 1:14-19 and 1:20-23) God, by using the power of His Spirit, during the first three days of Creation brought light back to the surface of the earth, formed the atmosphere and nicely distributed the water in land so that beautiful plants and green grass could grow. On the Fourth day, God cleaned the atmosphere to have a clear sky with a beautiful vision of stars and moon at night time and, on the Fifth Day, God made life in the rivers, lakes and oceans and created birds flying through the air. This idyllic origin is totally different with what astronomers, geologists, palaeontologists and naturalists have envisioned and described on the basis of many convergent observations and objective findings.

About 4.6 billion years ago, an enormous amount of ice particles and solid materials, swirling within the solar nebula, started to aggregate in gigantic spheres, that slowly took different orbits and originated the solar system made of the Sun, the Earth and eight (Pluto has been excluded) planets. During this initial turbulent phase, some four million years thereafter, a Mars-sized body, named Theia, struck the infant Earth and, after a tremendous impact, some vaporized material was projected into a near orbit giving rise to the Moon, as an Earth satellite. But the Earth formation had not been completed at all because during the following years, innumerable meteorites often struck the young Earth. During this fiery stage, the planet surface remained fairly viscous, while iron-rich material sunk towards the inner core, which today is a solid iron sphere with a diameter of about 2,556 kilometres, able to explain the geomagnetic dipole field (Glatzmaier and Olson, 2005). Large asteroids continued “to rain” on the young planet (in contrast, today small asteroids can hardly reach the surface) at a speed 70-times faster than sound liberating enough energy to melt the mantle. 4,4 billion years ago the surface temperature might have been around 900 °C because the decay of radioactivity deep underground generated so much heat to maintain it. On the other hand, the early heat radiation of the sun has been estimated to be tepid. Indeed the period of the initial era, denominated “The Hadean”, remains controversial and it might have lasted from 200,000 up to 700,000 million years (Valley, 2005). The environment was prohibitive for life, not only because of the semi fluid superficial magma but because the atmosphere contained nitrogen, carbon dioxide, water vapour and acid gases only. As the fall of meteorites and volcanic activity relented, the temperature of the surface plummeted allowing an initial formation of a super continent, named Rodinia, floating in an immense ocean. It remains doubtful whether the first signs

of anaerobic life appeared 1 billion years after Earth's birth because unicellular organisms do not form a fossil.

A turning point occurred after a further 100-150,000 million years (or 1.1 billion years from the beginning) when fossil stromatolites and traces of cyanobacteria have been recorded. **The appearance of cyanobacteria was a most critical event because they were able to generate oxygen that, by slowly moving into the atmosphere, caused a dramatic environmental change.** We do not know the real concentration of oxygen after 2, 2 billion years from the origin but I would guess that it might have been far lower than the 20.7 % concentration of today. Another 600,000 million years elapsed before the appearance of the first algae. The oxygenation process has been so important for the birth of life on the planet (Lane, 2004), that a few details of its chemistry must be given: cyanobacteria are primordial bacteria (prokaryotes do not contain a nucleus), improperly referred as blue-green algae, which most likely originated in the presence of an organic material enriched-saline solution near warm deep vents fed by deep volcanic activity (Lutz and Kristof, 2000). The released oxygen reacted with iron ions dissolved in sea water and the new compound precipitated as iron oxide. This process went on for many millions of years but, once the soluble iron became exhausted, oxygen saturated the water and began to emerge into the atmosphere. Even today cyanobacteria, with the great support of plant photosynthesis, help to maintain oxygen concentration at its normal level in the air. It has taken this long period of time before the earth's atmosphere contained enough oxygen to cause another critical shift, that is the passage from anaerobic (without oxygen) to aerobic (with oxygen) life (Canfield et al., 2007). As it will be discussed in the next Chapter, this means that a new type of cells (eukariotes, i.e., better organized and efficient cells with a nucleus and mitochondria) took place and, still very slowly, progressed towards multicellular, albeit very simple life (metazoa). In fact almost another 3 billion years passed before we reached the Paleozoic era, more precisely the Cambrian period that ranges between 540 million years (or 4,130 billion years from the Earth's birth) and the beginning of the Ordovician period (488 million years ago). Although the Cambrian period is only characterized by invertebrates (typical the Coelomate radiation), they had already developed a primordial nervous system and they may have expressed a behaviour pattern.

It is worth while noting that when oxygen began to increase in the atmosphere, it paradoxically represented a pollutant and toxic gas for the anaerobic bacteria, which either became extinct or hid under-ground in oxygen-free niches, where they still thrive today and actually represent a considerable part of the terrestrial biomass. Someone may be surprised to learn that many types of anaerobic bacteria live commensally in our gut and are useful in many ways (Bocci, 1992); moreover, another example is that tetanus, Clostridium bacteria and Bacillus anthracis,

omnipresent also as spores in several habitats (soil, rusted iron), can cause either tetanus or gaseous gangrene, or anthrax, respectively, in humans.

The evolutionary and ecological success of cyanobacteria is both due to the fact that they are ubiquitous as they can live in water and rocks, and to their ability to transform gaseous nitrogen (today present in air at a 78% concentration), into precious nitrogen compounds (ammonia and nitrates) particularly useful for the cultivation of rice and grains. Moreover, by transforming carbon dioxide present in air, via photosynthesis, into carbohydrates, they lower the dangerous increase of carbon dioxide, responsible for the warming of the planet. This digression served to emphasize how cyanobacteria have changed the Earth's fate, because a planet only inhabited by anaerobic bacteria would have been ugly and dull in comparison to the actual presence of beautiful animals, plants and flowers. Only with a stable oxygenated environment, evolution of skeletal animals became possible only about 540 million years ago (Canfield et al., 2007). During the Paleozoic, Mesozoic and Cenozoic eras, spanning some 520 million years, the Earth was inhabited by progressively more complex multicellular organisms namely fishes, reptiles, dinosaurs and birds. Following the extinction of the dinosaurs about 65 million years ago, mammals, including humans, evolved from small shrew-like types into the types still present today. Throughout this long period some important geological, thermal, chemical and cataclysmic events, which have taken place in these last 500 million years, must be mentioned because not everyone knows the truth and may think that these are scientific inventions for minimizing the story of Noah and the Flood. This is a nice tale to tell children but is absolutely unrealistic, if one only imagines what should have been the size of the Ark for holding peacefully all the pairs (male and female) of all animals for a long period. (Story of the Deluge in Genesis 6:11-9:19). Obviously it is only a metaphoric tale, positively not corresponding to any geological time, but some people believe it is true! It needs to be emphasized how the Creation, as described in the Scriptures, does not minimally fit into the anaerobic and then aerobic atmospheric evolution of the Earth. There is very good scientific evidence that this anaerobic-aerobic transition did really occur to prove that God has nothing to do with the Earth creation and evolution.

Regarding the dynamic state of the Earth there are four considerations to be made. Firstly, the position of the continents, observable today from an orbiting satellite, is only transitory because they are made of at least seven huge interlocking plates composed of the earth's crust and of the uppermost part of the mantle as thick as about 60 kilometres (or ~37 miles), floating and undergoing a continuous shift over the hot and very viscous mantle. The plate tectonics theory, first put forward by Alfred Wegener in 1921-1922, is now universally accepted and proven by disastrous earthquake manifestations, as well as by precise measurements of the continents' shift made with the help of satellites. As another typical example,

Mount Everest continues to raise more than 1 cm a year together with the remaining Himalayas and the Tibetan plateau. The earliest supercontinent Rodinia began to break apart some 750 million years ago and, after changing into the continent named Pangea, about 200 million years ago, very slowly tore into the six modern continents. The motion of continents is unstoppable and, when 2 or 3 plates collide, the result is a frightening earthquake with often many deaths. Although it will not affect us, Christopher Scotese, on the basis of the current trend, has recently hypothesized that, within 100-250 millions of years, the Americas will smash into the merged Euro-African continent giving rise to a new super continent named Pangea Ultima, but this is only a prediction.

Secondly, the tropospheric temperature of Earth has been erratic and has changed from almost tropical to a freezing climate. In fact there have been at least four severe glacial periods during the last 2.7 billion years at variable frequencies, possibly due to the periodic changes of solar output or of the greenhouse gases (carbon dioxide, methane, sulphur oxide) concentration in air, or of possible simultaneous oscillation in Earth's orbit around the Sun or finally to episodes of volcanic activities. However volcanism may cause an ice age only if it generates enough dust, smoke and aerosol clouds to block significantly the solar heating for thousands of years, which seems improbable. Ice ages have been documented by reasonably good geological, chemical and paleontological data that altogether provide unambiguous evidence. The earliest ice age may have occurred during the early Proterozoic Age (2.7-2.3 billion years ago). The most severe one occurred during the Cryogenian Period (800-600 million years ago) and produced a Snowball Earth in which the sea ice reached the equator. Thereafter the Earth has undergone several cycles of glaciations every 40-100,000 year time scale with the last severe glacial period ending about 11,500 years ago (Epica community members, 2004)

Thirdly, many catastrophic volcanic events have been recorded and some powerful undersea eruptions, associated with an earthquake, have caused also tsunamis of unprecedented violence. Although after billion of years, volcanism tends to slow down as shown by many extinct or dormant volcanoes, who has not heard of the famous mount Vesuvius (Italy) eruption, described by Pliny the Younger (79 B.C.), that buried Pompei, Herculaneum, and Oplonti or, in 1980, the terrific mount St. Helen explosion, that transformed a vast pristine forest into a wasteland? All these manifestations demonstrate and remind us how the Earth has become alive and are a testament of human inability against nature's power.

Fourthly, since the Cambrian period, there have been at least five mass extinctions (Table II).

TABLE II. *The main mass extinctions on Earth**

Time ~ million years	Period	Atmospheric carbon dioxide (~ppm)
250	Permian	3,000
190	Triassic	1,300
168	Toarcian	2,000
100	Cenomanian/Turonian	1,500
65.5	Paleocene	800
A.D. 2007	Present	385
A.D. 2100	Future	1,000?

**Data adapted from a Ward's diagram (2006)*

These have been devastating (Kump et al., 2005; Ward, 2006) but the third one, the “Great Dying”, that occurred almost at the end of the Permian period (250 million years ago) has been the worst: more than half of families were lost and trilobites and many insects became extinct. Life on earth almost disappeared and, when it slowly began to reappear, the fourth event, at the end of the Triassic period (210 million years ago) took place. Many reptiles and invertebrates disappeared but soon, to show the power of life, dinosaurs started to flourish and dominated the Earth until they could not survive after the fifth extinction, right at the end of the Cretaceous period 65.5 million years ago. Many people have learnt how fierce the dinosaurs were in Spielberg’s 1993 film! Nonetheless, every cloud has a silver lining because, after their disappearance, small mammals, which could not develop because of the dinosaur’s interference, started to grow and differentiate until, at long last, after many million years, a small African ape became able to stand upright as a prelude to humans (Chapter 5). An interesting hypothesis had been advanced to explain the origin and consequences of these extinctions. In the late 1970’s, Luis and Walter Alvarez, Helen Michel and Frank Asaro made a remarkable discovery when they, first in Gubbio, Italy, detected a thick layer of iridium, a rare metal on the earth, deposited some 65.5 million years ago all over the globe, which suggested that a large asteroid, 10 kilometres across, struck the earth with such an explosive violence to create enormous clouds able to obscure the Earth for probably more than 1,000 years. It has been hypothesized that very large meteorites (with diameters as wide as 80 kilometres) may have struck the Earth’s crust (Kerr, 2004; Rubin, 2005), causing tremendous explosions probably similar to those provoked by the most powerful hydrogen bombs. The impact could have been able to set inextinguishable fires and generate immense clouds containing trillions of tons of detritus and toxic gases, responsible of destroying the

flora and killing all the exposed animals. The Permian (250 million years ago) and the Cretaceous-Tertiary (K/T) extinction (65.5 million years ago) may have been triggered by a monstrous asteroid impact because the Barringer meteor crater (Arizona, USA), the Chicxulub crater (Yucatan Peninsula, Mexico) and the Bedout crater (North-western Australia) appear geologically related to the extinction periods. Moreover there is evidence (Ward, 2006) that a change of the environment, initially triggered by widespread volcanic activity, is followed by a chain of negative reactions characterized by the increase of carbon dioxide, methane and very toxic hydrogen sulphide with ocean anoxia and a successive destruction of the ozone layer in the stratosphere. This sequence of events has undoubtedly catastrophic consequences on Earth's life. The present century may be crucial for mankind and, unless we soon make judicious choices, we are heading towards the sixth extinction. While it is undeniable that our planet, when humans were absent, has gone through very difficult periods, our recent and excessive activities help the weather to go from bad to worse.

In any case, even if we stop being reckless, our planet has already reached a middle age because the Sun will expand to a red giant in about 5 billion years. This means that the Sun will steadily increase its potency at a rate of some 10% every billion years. This progressive increase of radiation implies water evaporation; hence, the loss of the oceans will lead to the end of life. The Sun will become an ochre-red giant and will swell so much to englobe Mercury and Venus, which have their trajectory nearest to it than our planet. Most likely the Earth will escape but it is a meagre consolation because it will first be incinerated and then the solar system will end to be dark and ice-cold. As astronomers have already well documented the life-time of other stars, this is realistic and I would say an inescapable conclusion (Balick and Frank SA 2004). Some humans today could not care less about this dire forecast but others will, because some of us are and will remain anxious to know what mankind's future is. **We must face the truth that mankind will not be eternal as some religions have supposed: this is a good reason to give a value and a good justification during our extremely brief existence.** Someone may think that our intelligence and the rapid pace of technological progress may even accelerate and, perhaps, after one million generations from now, humans will be able to escape towards another younger Solar system. Without being pessimistic, this is unlikely to happen because, as history remind us, all the greatest civilization of the past, after 2,000 to 3,000 years have finished in ruins. Secondly, because, even assuming the existence of another suitable Earth, there are several good reasons to make this emigration practically impossible (Chapter 13, Scenario 5). As things in the world are now, it is doubtful that, as someone has postulated, we are on the threshold of an evolutionary leap and that computer science will help us sufficiently. Thus, at this time, we will remain with the doubt whether humans will survive or will likely disappear with the Sun's demise.

It is sad that our beautiful planet will eventually die because I liked the Gaia theory invented by James Lovelock and Lynn Margulis in the 1970s. They proposed the name Gaia to honour Gaea, the ancient Greek myth of Mother Earth. Indeed the Gaia concept lets us understand how much we owe to the Earth: first of all a liveable environment, an incredible variety of flowers, the beauty of a sunset, the movement of the sea and the artistic geniality of humans. I have objectively exposed the tormented birth and infancy of the Earth: many disastrous events have almost annihilated the life that she created and nurtured but luckily, in spite of many extinct creatures, it has recovered until evolution has allowed the selection of a small mammal with a big brain, that while alive, allows him to think, to invent and to have a conscience and a soul. While it is preferable not to argue against the idea that Gaia is a “living” organism, it is reasonable to simply compare the Earth to an ancient human being: The Earth has a skeleton represented by the solid iron of the inner core, She has a skin represented by the crust often with a sort of furuncles ejecting lava, She has a respiratory system centred in the windy atmosphere where She delivers oxygen and tries to eliminate carbon dioxide, She has a circulatory system represented by the continuous flowing of the immense transoceanic currents, She is dynamic as the continents are never still, She has a rudimentary nervous system receiving and reacting to impulses from the Moon and the Sun, She hosts an extreme variety of life on the surface and on the lithosphere, but She has not a thinking brain. As many other planetary systems, She has a finite lifetime and, like humans, the Earth, once her cycle is over, will not have an after-life.

On the sixth day (Genesis 2:8-9, 15-17), God created a beautiful garden called Eden with trees plenty of delicious fruits. Then God created Adam out of the dust of the ground and breathed into his nostrils the breath of life and Adam became a living creature. If Adam would take fruits from the Tree of Life, he would have gained spiritual knowledge and would be entitled to eternal life. God wanted to challenge Adam and warned him not to pick any fruit from the Tree of the Knowledge of Good and Evil because if he would disobey, he would lose for ever the joy of spiritual truths: God, in his omniscience, must have known what will happen but somehow wanted to test human intelligence and honesty. Although Adam discovered that, among animals, he was the only creature with intelligence and a sense of self awareness, felt alone. So, while he was asleep, God removed one of Adam’s ribs from which God created a woman named Eve. Adam and Eve could be happy for ever but Eve picked and ate with Adam the prohibited fruit thus disappointing God, who expelled them from Eden and placed a cherub with an omnidirectional flaming sword to guard the entrance into the Garden. As far as I understand, the Genesis is a poetic work and the creation story may be accepted as an allegory. Indeed it cannot be a reliable historical description because Noah (in Genesis 5:29) appears as the son of Lamech and ninth in descent from Adam: the history of the Flood narrates that all humans, owing to their wickedness, perished

except Noah's family with his three sons and relative wives, who received the command from God to: "be fruitful and multiply, and fill the earth". Unless we blindly believe these stories, they appear disjointed and can only be accepted as symbolic and without any possibility of checking their reliability. Adam and Eve betrayed God and were expelled from Eden and the descending humans have to be drowned by the Flood because, in spite of descending from Noah, who was often drunk, the subsequent population was worse than before and had to be guided and corrected by Abraham (about 1812-1637 BC) and Moses' efforts, until the son of God, Jesus Christ, with his terrestrial sacrifice, could redeem all of us from the original sin.

The five extinctions, of which we have objective proofs, have been caused by a number of causes, namely volcanism, toxic gases, meteorites and earthquakes, are not mentioned in the Scriptures because they are antedated. Most likely there has been more than one Flood because some seventeen stories have been reported regarding inundations occurred in Europe and in the near East. Truly enough, geologists and palaeontologists have detected shellfish, plant fossils and fishes (we did too as described in the Preface) in sedimentary rock layers. However it is practically unbelievable that ALL the emerged continents went underwater at the same time if Noah's Flood did really happen from 3,000 to 5,000 years B.C. If, as reported in Genesis (Chapters 6 through 9) everyone was drowned except Noah's family, by now we would have found plenty of recent human fossils after such a cataclysmic event but this is not the case. Moreover it is unconceivable that from the three couples of Noah's family, within the short time of about 5,000 years, the world population could have expanded to 6, 5 billion people of today. An approximate calculation indicates that, by considering the brief half life at that time and the high child mortality, the world population, during the first 500 years after the Flood might have been composed of only seven million people.

I am glad to acknowledge that today the Roman Catholic Church, the Anglican Church as well as the Theistic Evolution accept the theory of Evolution, thereby revising the previously indicated inconsistencies. By the 1990s, a socio-political movement of conservative Christians cannot accept the diminishing role of God and have proposed the concept of an Intelligent Design (ID) Creationism. I respect the faith of ID supporters and obviously they desire to restore Christianity at all levels but the imposition to teach only ID in all American schools cannot be accepted. However I would hope that they will abandon their prejudice and scepticism against Science. There are an impressive number of geological, palaeontological, archaeological, morphological and genetic data (all supported by valid radiometric dating) collected by many scientists during the last 200 years that together strongly indicate how Earth evolved and how life developed. Nobody has the right to deny these results that are continuously perfected but if the ID proponents believe that they are false or irrelevant, any objective discussion

becomes impossible. Up to a point, if it can be understood the fervent belief and sectary's spirit of illiterate people, it cannot be forgiven the stubbornness of knowledgeable persons. The argument of the theologian William Paley is fairly well known: the design of a watch is so complex that requires the superintelligence of the watchmaker and similarly a living organism is so complex that only God could create it. This reasoning implies that the Earth and life are a gift of a supernatural mind. It is axiomatic that God fully understand the human weaknesses and that He is merciful. How then God or Allah could allow a death toll of 300,000 humans caused by the Sumatra-Andaman earthquake-tsunami on December 26, 2004? I have mentioned Allah because it had been written that the tsunami was a divine punishment for lay Muslims shirking their daily prayers or killing other Muslims in an ongoing conflict. Why did God allow the third extinction (the "Great Dying") that destroyed practically all ocean dwellers and some 70 % of plants, insects and animals, 250 million years ago when apes were absent? And is it thinkable that dinosaurs have annoyed God so much to be wiped out 65 million years ago (fifth extinction). Is it possible that God would allow the drowning of all mankind except the Noah's family? Everyone can imagine how many million of innocent children and women have lost their lives because of volcanic eruptions and earthquakes throughout the Earth's life-time. History shows that after Christ's crucifixion and after numerous slaughters, the behaviour of mankind got worse than before. During the last century, owing to wars and genocides, the Earth has become a slaughter house working nights and days. Is it necessary to add the decimation of the world population by cholera, tuberculosis, plague, malaria, HIV-AIDS? The supporters of the ID movement, which have an unbelievable financial and political support, should use common sense because it is so obvious and undeniable that the turbulent development of Earth is only due to a sequence of natural phenomena, which have nothing to do with the wrath of heaven.

Chapter 4

HOW AND WHEN BIOMOLECULES AND LIFE HAVE ORIGINATED

In the preceding Chapter, it has been mentioned that the simplest form of life may have arisen 3,5 billion years ago (Schopf et al.,2002), while the first fossilized algae, possibly cyanobacteria may be the Pre-Cambrian stromatolites in the Siyeh Formation Glacier National Park. The big question how life originated on Earth remains open: one possibility is that life was created by God or by an Intelligent Designer and creation passed down from generation to generation. Humans, who believe in God, do not need any scientific demonstration but this belief cannot be proved. It appears very unlikely because it does not agree with the exuberance of fossil records accumulated during the last 2 billion years whereas God's creation has been said to have been performed some 20,000 years ago.

The second hypothesis is that life began from 3,6 to 3,5 billion years ago spontaneously in particularly suitable niches as the result of a sequence of chemical reactions. It may have taken many millions of years to accomplish this feat and, only after many failures, a reaction heedlessly succeeded to trigger the simplest form of life.

The third hypothesis only shifts the problem from Earth to another planet in the sense that a primordial life may have reached our planet through an asteroid from Mars or Venus. The assumption is that Mars cooled down before the Earth and may have had a suitable environment for allowing prebiotic processes to occur (Bell, 2006). We do not know if there is life in the icy Mars of today but probably it is only a question of time to solve this mystery. Nonetheless I am not enthusiastic about this possibility because I feel that the environment must have been more favourable on Earth than in Mars and only a sizable asteroid could have retained a trace of life after attrition with the Earth's atmosphere and a violent impact. Thus it remains to evaluate the second hypothesis.

Louis Pasteur was clear in excluding the possibility of a spontaneous generation but he could not explain how the first bacterium was generated. Darwin, probably for not displeasing too much his wife, wrote in *The Origin of Species*, that "the Creator breathed life into a few forms or into one" But in a private letter, he intuitively wrote that life may have arisen through chemistry "in some warm little pond". Some 70 years later, Aleksandr Ivanovich Oparin wrote: "*The Origin of Life on Earth*" and not only endorsed Darwin's idea, but proposed that life could have arisen in an oxygen-free "primeval soup" of inorganic and organic molecules that would slowly combine into a complex form eventually promoting the formation of a cell.

This idea has become the working hypothesis for the last 82 years but, so far, **we have been unable to create a living cell in the laboratory**. This means that the creation of a cell is an extremely difficult task but not an impossible one. The reader must consider that, particularly a eukaryotic cell, like our own, is a fantastic building made of a variety of complex molecules with a composition and structure that intensely engage any biochemistry student for at least one year before passing the exam. Furthermore the cell is made of several organelles that harmoniously interact among themselves for performing physiological activities as muscular contraction, respiration, energy production, protein synthesis and secretion, internal digestion of dead components and proliferation during cell division. Clearly a cell is far more complex than a watch as simplified by William Paley.

Many distinguished scientists have made a considerable effort in evaluating whether it was possible to simulate what may have happened in a pond. In their laboratories, they have tried to synthesize organic molecules such as amino acids, sugars, phospholipids, proteins, and nucleic acids from inorganic, simple compounds, namely ammonia, nitrogen, methane, sulphur and common salts dissolved in warm water under reducing conditions (i.e. without oxygen) similar to those present in the prebiotic environment. In 1953, Stanley Miller and Harold Urey made the first exploration by testing a primordial inorganic soup activated by electric discharges as it may have happened during the early period. This was a good start because it proved the formation of some building blocks of life but it remained to perform not only the synthesis of nucleotides, RNA, proteins and so on, but their assembly with a potential catalyst able to trigger life. Several interesting approaches have been devised and each one has contributed a step forward, so that it seems likely that a close collaboration between chemists, biochemists and molecular biologists may be able to solve this important problem but this is one that attracts less attention and funding than topics of medical interest as gene therapy, stem cells and RNA silencing. I decided to skip the description of the available results because the layman would find them boring and because the aim of this book is to assess the need of religions. However the interested reader can appreciate the complexity of the problem, which still remains unsolved, in an expanded article written by Shapiro (2007). We don't claim that all scientific theories can be correct and it is essential to continue to test them before accepting or refusing them. An encouraging information is that Craig Venter, "The Genome Warrior", is now pursuing two projects: the first is to catalogue all the genes of our planet and the second is to seriously trying to create life.

However, where science has failed, Nature and time have most likely succeeded. I am not trying to find an excuse for our present failure but it looks likely that the unicellular life-form began, step by step from the relatively simple ancestral fermenting bacteria to prokaryotic cells some three billion years ago in an anoxic, warm seafloor spring, rich of methane, hydrogen sulphide and some other critical

components that so far have escaped our attention. The evolution towards the eukaryotic and aerobic cells must have been extremely slow and, by knowing our limitations, we humbly admit that it has taken almost a century to discover in 1977, that our cells continuously synthesize and release traces of gas, such as nitrogen oxide (NO) and carbon monoxide (CO) acting as crucial physiological messengers. Before evolving towards the final eukaryotic cell, able to use oxygen, it has taken another billion years but, obviously, random processes need time that humans do not have but Nature has plenty.

Chapter 5

THE EVOLUTION OF HOMINIDS AND HOMO SAPIENS

God created Adam and Eve on the sixth day in the Garden of Eden (Genesis 2:8-9, 15-17). The location is hypothetical and Noah was a member of the ninth generation (Genesis 5:29) while Abraham was born at a later date (about 1812-1637 BC). From the Scriptures, it seems that the first generation of human beings, identical to the modern man (*Homo sapiens*), may have originated some 10,000 years ago. The proponents of the Intelligent Design (ID) concept believe that humans were also created by a supernatural intelligence and that evolutionism and natural selection should not be taken into consideration. However I must add that now the Roman Catholic and the Anglican Church accept the theory of Evolution, thus giving less relevance to the ancient Scriptures. In fact both Christians and Jews value the Creation in an allegoric sense; this significant revision was advanced by Philo of Alexandria in the 1st century and Saint Augustine in the 4th century, sensibly excluding that the Creation could have been performed in a definite period of time.

It is not proficient to argue about the historical accuracy of the Scriptures and it is felt that everyone has the right to believe what is best for her/him. I was baptized when I was two-days-old and I received a heavy imprinting (I prefer this term to brain-washing) only from the Christian Church without any consideration for other religions. Today I am convinced that the great number of findings, collected by palaeontologists, anthropologists, geologists, astrophysicists, naturalists and genetists during the last century, indicate that life in our planet arose, probably at different sites, by random events in a abiotic environment about 3,5 billion years ago and very slowly developed with initial difficulties throughout innumerable catastrophes due to volcanism, earthquakes, impact with meteorites, floods, several glaciations, fires and troposphere pollution with toxic gases. These events, which are a consequence of the Earth's intrinsic nature, have often almost completely extinct vegetable and animal life, but in open contradictions with the Scriptures, some six million years ago, have allowed the slow evolution of humans after diverging from apes. The recent great progresses in determining the genome sequence of the Rhesus macaque, diverged about 25 million years ago from human and chimpanzee (Rhesus Macaque Genome Sequencing and Analysis Consortium, 2007) and of the collagen I sequences of *Tyrannosaurus Rex* (disappeared 68 million years ago) are very encouraging in believing that, in the next decades, the concept of evolution of animal species from the very first eukaryotic cell will be demonstrated (Schweitzer et al. 2007; Asara et al., 2007).

I deeply admire Darwin's work, not simply for his intuition and insightful observations, but for the courage to publish his book in 1859, against traditionalistic ideas and bigotry of his time. One year later, during a memorable meeting in the library of the Museum at Oxford, bishop Wilberforce affirmed that the idea of evolution was a nullity and, with a smiling insolence asked to Thomas Huxley (Darwin was a shy man and did not want to be present), who was a convinced evolutionist, if he descended from a monkey through his grand father or his grand mother. Huxley annihilated the bishop by answering that, while he was proud to descend from a monkey, he would be ashamed to be connected with a man, who used great gifts to obscure the truth.

There is little doubt that Africa was the birth place of mankind because most of our fossilized earliest ancestors have been painstakingly discovered along the Ethiopian Rift Valley. Six million years ago, the area between lakes Turkana and Victoria, though a bad copy of the celestial Garden of Eden, was a fertile and wet woodland rich of vegetations and of several mammal species of which some ferocious (Leakey and Walker, 2003; Begun, 2004) This territory has given birth to the most important evolutionary experiment!

Unless one has a bit of experience, it is difficult to imagine how much time, patience, dedication and an innate ability are necessary to search and detect our ancestor fossils in an arid soil under a burning sun. For many reasons fossils have disappeared but some, by a stroke of luck, have remained trapped in sediments sandwiched between layers of protective material, which is extremely important for gauging the real age by precise carbon dating techniques. The detractors of evolutionism are always ready to criticize the paucity of the paleontological findings or the missing data, but paleoanthropologists never get discouraged and a new remarkable prehuman fossil comes to light practically every year. Alemseged with his collaborators (2006) have recently described the complete and reasonably well preserved skeleton of a three-year-old *Australopithecus afarensis*, nicknamed Selam (peace), who lived in Dikika, Ethiopia 3,3 million years ago, more or less some 100,000 years before the famous Lucy, unearthed in 1974 by Leakey's team (Wong, 2006).

Fossils, with molecular and geological results converge in indicating that the human-like lineage diverged from that of the chimpanzees between 6 and 7 million years ago. The first crucial transition has been the change from quadrupedalism to bipedalism and surely the possibility to walk upright, for several reasons, must have taken a long time to become established. Occasionally, even chimps and gorillas can walk upright because they have found it useful. I suppose that a random genetic mutation may have favoured the change in one or two animals but, surely, many generations were necessary to see it firmly established in a relatively large population. The complex of our genes are never still: if a deleterious mutation

comes about, more or less rapidly it will be deleted, but, if a positive one appears, it will expand with successive generations.

The erect position was quite a change and to come true involved a structural modification of the spine, a broader pelvis with improved hip joints, longer and robust femurs and tibias with improved knees and the arching of the feet for allowing a higher elevation of the heel. All of these modifications must have taken several steps and quite a time before becoming the hallmarks for distinguishing fossils from apes or humans. Why the ape-like humans selected to walk remains open to speculation: an idea is that the upright position allowed the exploration of the surrounding territory, improved the body thermoregulation and saved energy in travelling long distances. Another possibility is that the human male became more agile and could gather more food for him and the family. We should not forget that the Australopithecines reached a dead-end about two million years ago and made room for the new genus *Homo*.

What happened and what was the reason for this breakthrough? It is reasonable to imagine that the previously fertile land of central Africa became progressively less suitable to feed an increased population of vegetarians, thus instinctively stimulating the search for a more nourishing food. I am convinced that the need, almost an obsession, to find enough daily food and water must have been the central thought in the small brain of the australopithecus and that there is no better pressing stimulus than chronic hunger for accelerating evolution. The paleontological cranium size testifies that, while chimps and orangutangs had a brain size of about 350 cubic centimeter, (cm³), which has reached today about 400 cm³, the *Australopithecus afarensis* had a brain size of about 385 cm³, that slowly increased up to only 415 cm³ (*A. africanus*) and to about 500 cm³ in the *A. boisei*. The switch to the genus *Homo* was characterized by an impressive and progressive increase of the brain size: from about 600 cm³ in *Homo habilis*, to 900 cm³ in *Homo erectus* and then to about 1200 cm³ in the *Homo Neanderthalensis* (200,000-30,000 years ago), to finally reach a volume of about 1400 cm³ of the modern *Homo sapiens, sapiens*.

Two fundamental factors must have caused this new development: firstly, during one million years, a striking modification of the genetic composition of the human brain, in comparison to chimps' brain, must have occurred. A recent publication has pointed out a significant increase in as many as 49 regions of the human genome with the most marked shift of the human accelerated region 1 (Dorus et al., 2004; Pollard et al., 2006). Although we have 98.6 % of our genome in common with chimpanzees, our genome has undergone an estimated 15 million changes during the last 7 million years. It must be clear to everyone that the evolution of the human brain from *A. boisei* to *H. habilis* and *H. erectus* (1,8-1,4 million years ago) has been an exceptional event because, it is not only the size (hence the number of neuronal cells), but the special reorganization of several cerebral areas and the

improvement of cognitive functions that have allowed an incredible leap forward. Our Homo ancestor started to think, to make primordial tools and to programme hunting, to sketch animal figures in caves' walls and began to travel towards new horizons and new adventures (Shreeve, 2006). At the same time he and his family became able to enrich the daily diet with richer foods particularly animal (occasionally also human) meat. This change has been amply documented by the most recent fossilized skulls and mandibles: cheekbones became more delicate and, in comparison to Australopithecines, used to eat tough, fibrous and raw plant food, paleanthropologists have measured larger incisors and smaller molars.

It appears probable that the various Australopithecus coexisted for many years in central Africa but tended to expand towards South Africa and the North towards Sudan and Egypt. About 1.8 million years ago, once Homo erectus had reached the near East, he progressed towards Georgia and South Asia arriving in China and further down in Indonesia (Tattersal, 2003). Although the evolution of humans seems to have taken a long time, in comparison to 3.5 billion years from the birth of unicellular life, it has been completed in only 0.17 % of the whole period (Cann et al., 1987; Wong, 2006). In the next Chapter, his evolution in Europe during the last 200,000 years will be evaluated. As a brief conclusion, if the Creationists want to listen, it appears that the modern man has had a troublesome past and was not created *ipso facto* as reported in the Scriptures. He had to be a constantly restless creature and nobody knows where he is heading now. A thought that I can't dismiss from my mind is why God, who is by definition, omniscient, omnipotent and merciful, had really created the Earth would have allowed the happening of so many tribulations for humans.

Chapter 6

THE HARD LIFE OF HUNTERS-GATHERERS AND THE BEGINNING OF THE EARLY CIVILIZATION WITH THEIR POLYTHEISTIC RELIGIONS.

In spite of approximate dating, already 1.8 million years ago, the Hominin population (Begun, 2004) had penetrated Europe and have reached China and Java. *Homo heidelbergensis* lived in Europe and possibly in China from 500,000 to 200,000 years ago but the best known representative of this species was *Homo neanderthalensis*, who was widely present in Europe between 230,000 to 28,000 years ago. The Neanderthals, who occupied Gorham' Cave, Gibraltar were the last survivors before their extinction after the arrival of modern humans in Europe (Finlayson et al, 2006). During the Old Stone Age, including the Palaeolithic and the upper Palaeolithic phases (from 100,000 to 8,000 years ago), most of Europe was under ice sheets that retreated only around 10,000 years B.C. (EPICA community members, 2004). During the first 70,000 years, *H. neanderthalensis* occupied vast areas of the South and central Europe and must have undergone a very hard life owing to the severity of the weather, scarcity of food and occasionally famine. On the basis of more than 40 fossils recorded during the nineteenth century, the Neanderthals appeared to be heavily built, of low stature (about 1.6 m), weighing 55-70 Kg and with an average brain volume of no less than 1200 cm³: they looked less ape-like than *H. habilis* and *H. ergaster* but certainly not refined as the modern man because the skull showed an arched browridge and a receding forehead (Wong, 2003). They endured an extremely cold environment by living in caves and, by modelling primitive stone tools, were able to hunt small animals like hares and foxes necessary for obtaining a much needed high-caloric diet. Covered with fur garments and hides, they could adapt to cold latitudes and for the urgent need of food, they must have scavenged naturally dead animals such as huge mammoths. On the basis of mitochondrial DNA and Y-chromosomal DNA data, it appears that the Neanderthals hardly mixed with the newcomer *Homo sapiens* and there is consensus that they are not our ancestors (Green et al., 2006; Noonan et al., 2006). Although they were not cultureless as it was supposed, they were unable to compete with *H. sapiens*. Why they faded away, it remains a mystery and it has been hypothesized that they lacked some essential vitamin due to malnutrition. This reminds me that in the 19th and at the beginning of the 20th century, the poor peasants in Northern Italy and even in the South of United States, died of Pellagra, the “disease of the four D’s”, i. e. diarrhoea, dermatitis, dementia and death, caused by the lack of niacin in their diet. It has been also hypothesized that Neanderthals lacked the tribal social instincts as *H. sapiens* had, thus remaining secluded.

Around 150-200.000 years ago, always in central Africa, *Homo erectus* slowly disappeared being substituted by a new species: the *Homo sapiens*. The earliest modern human fossils have been found in Omo Kibish, Ethiopia. *Homo sapiens* appeared anatomically modern, taller than the predecessor, with a body weight up to 80 Kg and a brain volume up to about 1400 cm³. In 1987, a research published by Cann et al., introduced the archaeogenetic science, by demonstrating that the majority of Europeans descends from seven female and ten male lineages. The original finding is not only important for presenting “the seven prehistoric Eves and the ten Adams” (others may have come later!) but for discovering that a new gene mutations, able to give rise to more sophisticated and brainy human beings, had occurred in a number of Africans. Another hereditary DNA mutation in the male (Y) chromosome, indicated with the acronym: M168, arose some 50,000 years ago. For the sake of brevity, it is unnecessary to give details of other gene modifications but today both fossils and DNA studies together, have clarified how the evolution of African hunter-gatherers, some 150,000 years ago, have generated the modern human population.

Genetists agree that today, modern humans, from Americans to Asians and Australians are practically homogenous in the sense that the human genome is 99.9 % identical throughout the world and we should not forget that our chromosomal composition remains, at least in part, similar to the one owned by the fruit fly. Hitler was dead wrong in affirming that the Aryans and particularly the German race was the elected one, because we are all the same. Among the native Amazonian and the Tasmanian aborigines there may be a 0.1 % difference, that is not really significant. Obviously we can notice some differences in the phenotypic (so to speak: superficial) features of an Oriental or of an Indian's, because, throughout millions of years, we cannot exclude other regional mutation, interbreeding and speciation further complicated by marked environmental differences. We also know very well how many times, during the last 10,000 years, populations have either mixed or, less frequently, remained isolated. Last but not least, we have such a wealth of redundant genes, which well explains why one brother and one sister, born together (from two mother's eggs and two sperms) do not look at all identical as mono-ovular twins. Therefore, it is now clear that there are no individuals with “blue blood”, or, in other words, kings, dictators, or supreme priests are not genetically different from the humblest of peasants. Again, on the basis of the well-known genetic polymorphism, it is unavoidable that someone emerges, either because more enterprising or more arrogant, and rules the majority. The problem was and remains today that only a minority of humans (practically excluding women) have the chance and the conditions to express their qualities and capabilities. We don't realize how many mathematical or artistic geniuses are lost for ever during each generation in poor countries because they die as children, or in rich countries are lost for abortion! In Part two, Chapter 14, I will

discuss how we can correct these disparities and avoid religious attrition that aggravates this situation.

I will now briefly describe how, thanks to genetic researches, we have a fair glimpse of the long journeys undertaken by *Homo sapiens* from Africa (Shreeve, 2006; Mellars, 2006). The new humans must have been very enterprising and set out to migrate in different directions. They went towards South Africa (Klasies River Mouth, 120,000 years ago). The approximate times and sites of fossils or/and artifacts are indicated between brackets. They went to West Africa and, through the Nile valley, reached the Levant. At Qafzek, Israel, a well preserved human skull, dated 92,000 years ago has been discovered. From the Middle East, they reached Europe during the Upper Paleolithic (40,000 to 30,000 years ago) and the so called Aurignacian culture produced sharp-edged stones, tools ornaments and mural drawings. I regret that I never had the possibility of visiting the gallery of bison's in Spain's Altamira Cave and the bestiary of horses and aurochs in France's Chauvet Cave

At similar times, they reached central Asia and, as ice was retreating, some groups moved towards Siberia (Yana River, 30,000 years ago). Taking advantage of very low sea levels or solid ice they passed through the Bering's strait arriving in Alaska (20,000-15,000 years ago). Thereafter they migrated to North America (Kennewick and Spirit Cave, 9,500-9,400 years ago). Then, it is incredible how they could migrate, avoiding the continental glaciations, along the West Coast toward Mexico and to central America down to southern Chile (Monte Verde, 14,800 years ago). When Columbus, in 1492 or some 17,000 years later, landed in the Bahamas found friendly natives and proved that the Earth was round. From central Asia, another fantastic migration allowed *Homo sapiens* to reach, by sailing on rafts, the Indonesian islands (Niah Cave, Borneo, 40,000 years ago) and both North (Malakunanja, 50,000 years ago) and South Australia (lake Mungo, 45,000 years ago).

Although the density of population was very low, the new humans had an insatiable desire to explore the Earth. I often wondered what was the driving force behind these emigrations towards unknown territories, mountains and seas, without a map or a compass but only guided by the Sun or a star, with either freezing cold winters or a hot climate, without horses or a rudimental cart; they went for thousands and thousands of miles at a good pace. Often they must have been hungry, thirsty and have to carry small, crying children. It is widely held that, in desperate occasions, they may have practiced cannibalism. In extreme situations of famine, cannibalism by necessity must have occurred and we do not need to knit our's brows because it has happened during WWII and in 1972, when a Uruguayan rugby team, flying across the Andes, crashed into the mountains and only a few survived because for more than two months they remained isolated in deep snow and could only eat the frozen bodies of their dead companions. During the last 2-

3,000 years in many cultures cannibalism has been considered sacrilegious but, in others, it assumed a ritualistic and revered custom. Most people don't know that all animals, including us, undergo a real autosarcophagy due to the cell turnover, meaning that, with the exception of perennial brain cells, new cells continuously replace old ones in our body. Every day we lose our skin cells in the environment, while many grams of our gut cells are replaced every two days as the dead cells fall into the gut lumen and disintegrate into their precious organic compounds, which are actively absorbed and used for building new cells. This autophagic process is nutritionally and metabolically very important because it reduces losses of essential amino acids and is able to maintain a proficient equilibrium, irrespective of the dietary changes.

During their long travels the early men must have found great difficulties for shelter to pass the night or during winter or the rainy season. It is easy to suppose that often some of them homed here and there in favourable areas but others continued their journey. A precise estimate of the world population is impossible but a reasonable guess is that about 8,000 years B.C. the total population may have been as little as 5 million with more than a billion people already perished along the different routes undertaken from Africa.

When I was young, during the Summer, I often dreamt to emulate my old Etruscan ancestors: I was living near lake Bolsena, an ancient extinct volcanic deep cavity now filled with water and, at sunrise with only a bottle of water, I left home with the ambition to walk through fields and woods towards mount Amiata, a beautiful shaped mountain created by ancient volcanic eruptions. I quickly realized my ineptitude for finding food but luckily, I often came across with big and juicy dewberries that quenched my hunger. I walked for hours but I never managed to climb mount Amiata because I found it too hard to sleep in the bush. However, when I spotted a fallen tree, I sat down and joyfully looked around: I filled my brain with the restful sight of the lake, the smooth undulations of the surrounding hills but I could never contemplate enough the crystal blue sky. If one can penetrate the deep infinity of the sky, one feels a great sense of comfort and becomes a tiny part of the universe. Thus, my little adventures were not entirely negative because they gave me an idea of the strength and courage of our ancestors. How lucky we modern men are, when we get up, have a warm shower and then we sip a cup of strong coffee!

It seems obvious to think that while humans were emigrating, they had too many difficulties to overcome everyday than to worry about honoring death or dedicating time to artistic activities. On the other hand, when several groups began to settle in the Middle East and Europe, during the Middle and New Stone age, from 30,000 years, particularly from 8,000 years ago to 1 B.C. they had improved their life conditions so much that they could start to plan the future and to think about death and to worry for an eventual afterlife. The idea to adore, or the hope to

be protected by one or more Gods, the concepts of Good or Evil, the need of a funereal service and of preparing more or less luxurious tombs enriched with gifts and food, were substantiated by a number of civilizations flourished during the last 3,000 years B.C.

Egypt, Greece and Italy conserve the best burials and monuments of this period. At long last the climate had improved and allowed the growth of plant life. Some 9,000 years B.C., agriculture was invented in Mesopotamia and probably the cradle for growing wheat, barley, lentil, pea, flax and wild chickpea was in the Fertile Crescent, an area in present days within south-eastern Turkey/northern Syria (Lev-Yadun et al., 2000). It was important to eat different legumes because chickpea contains the essential amino acid tryptophan, very useful for complementing a vegetable diet. Late Stone Age Europeans, 5,000 years ago, began to clear forests to grow several legumes as well as other non indigenous crop plants. Animals such as wild cattle, deer and pigs were abundant, while reindeer herds moved towards Northern Scandinavia and Russia. Tools were improved, jewelleries were finely worked and metals such as gold, bronze and iron were used to make prestigious objects and weapons. It seems paradoxical but **as soon as humans have plenty of food and became wealthy and powerful, they became obsessed by the thought of death and what would happen after death.** On an autumn day in Chicago in 1959, during the centenary anniversary of the publication of “On the Origin of Species”, Julian Huxley declared that “religious belief was simply an adaptive social feature of early humanity”.

Was the evolution of the genome all positive? This is a knotty point because the Homo sapiens became envious, selfish and bellicose and during the following years he has paid a very dear price.

I will briefly summarize a few of the early civilizations with their polytheistic religions. The Egyptian Kingdom has been one of the longest and lasted almost 3500 years, from 3150 to 31 B.C., when the Roman army conquered the Ptolemaic state. The sun was the main deity because its daily passage across the sky epitomized the cycle of birth, death and rebirth. The pharaohs were revered as gods and after death, they became immortal and join the gods. It is relevant to point out that the Egyptians believe that both the body and soul were important in life and in death. At all times we have had such a profound respect for great scientists, artists and even politicians and kings to bury them in majestic churches but we never did as well as the Egyptians: the Pyramids remain the largest and more imposing structure ever built and, of the Seven Wonders of the Ancient World, remain the only one. The dead pharaoh, after mummification was posed in a sarcophagus located in a chamber built in the centre of the pyramid with tools, food and precious treasures because it was imagined that his soul would return to the body to live an eternal life. The ideas of the soul with its unavoidable reconjunction with

the body, the belief in immortality are the basic ingredients that more or less will influence some of the future religions.

The Babylonian civilization flourished in Mesopotamia (modern Iraq) from about the eighteenth to the sixth century B.C. and, at that time, the plains between the Tigris and Euphrates rivers were very fertile. The history of the Babylonian reigns is very long and turbulent with wars, defeats and conquests but a remarkable collection of laws defined as the “Code of Hammurabi” are admirable. It was the sun god Shamash, who dictated a collection of laws mostly based on justice and equality to the Babylonian King Hammurabi. Remarkably the law protected the weak and the poor, including women, children and slaves against injustice at the hands of rich and potent men. Hammurabi was an exceptional King because he was a model of virtue and he stated to have been called by the Gods “to cause justice to prevail in the land, to destroy the wicked and the evil”. The ancient Hanging Gardens of Babylon in the palace of Nebuchadnezzar II (604-562 B.C.) was one of the Seven Wonders of the World and showed the superb level of Babylonian art and architecture.

The ancient Greek history elapses from 1100 B.C. through the Dark Ages, the Archaic and Classical periods and the Hellenistic or the Alexandrian period to 146 B.C. with the advent of the Romans. The periods have been based on the style of art, culture and politics and it is well known that Greece excelled in literature, philosophy, mathematics sculpture, architecture and economics. It is unpleasant to say but civil wars between Athens and Sparta apparently favoured the fabulous development of this civilization that has deeply influenced all Mediterranean countries. Probably, because we have to study so much Homer’s epics in school, we have learnt about the Greek religious beliefs. The Iliad is the chronicle of the war between the Achaeans and the Trojans of Asia Minor and reports all the Greek mythology and how various Gods and Goddesses influenced the adversaries. Zeus, the sky father, was influenced by the potent force of fate and he could not change the Destiny. Humans had to believe in the gods, perform the proper rituals and sacrifices. There are some aspects to comment: death was not envisaged to be a glorious thing but, in the afterlife, the soul was considered immortal. Interestingly the dead, after a proper burial, were doomed either to go to Hades, which was a cold, damp and dark realm, or to Tartarus, the deepest region of the underworld, that was the eternal destination of terrible sinners. Only the good people were designed to inhabit a paradise called Elysium or Elysian Fields where they could enjoy an easy life in a beautiful place. These ideas have been followed by subsequent religions and nobody better than Dante Alighieri in “The Divina Commedia” has poetically and masterly described the afterlife. The concept of reincarnation was widespread in Greek philosophy but Plato indicated that souls do not remember their previous experience when enter another body. He came to

consider God as a perfect abstraction and practically destroyed the Homeric Olympus. Later on the Greeks accepted Christianity.

In the central part of Italy, the Etruscan civilization lasted from 800 to 283 B.C. when, after losing the battle of Lake Vadimone, the Romans occupied all their territories. The Etruscans followed the path of the Greek religion and they believed in a number of divinities and in eternal life. They became famous because, like the Egyptians, they were very concerned in burying their dead in beautiful sarcophagi, hidden in tombs, which are still well preserved near Tarquinia, and these archaeological findings emphasize their belief in the afterlife.

The Roman Empire was founded in 753 B.C. and, while the Western Roman Empire ended in 476 A.D. during the Ostrogothic invasion, the Eastern Roman Empire fell in 1461 A.D. in the hands of the Ottoman Turks. The initial religion was based on a rural animistic tradition but, as Romans invaded other regions, they absorbed the Greek, Etruscan and other countries' mythology. As soon as Romans had an empire, on the pharaoh's model, they began to deify several emperors, namely Augustus, Claudius and Titus, who were entombed rather modestly. From 64 A.D., at the time of Emperor Nero, they persecuted Christians, until Christianity became the state religion of the Roman Empire in 323 A.D., under Constantine the Great because in A.D. 312, during the night preceding the battle against the rival Maxentius, he had had a vision of the sign of Christ. It appears that Romans were more apt in organizing an efficient state with powerful armies and interest in building roads, aqueducts, bridges and a valid legal system than inventing a new religion. Patricians and senators had little belief in the rites and, particularly during the first 1000 years of the Roman empire, they tried to do the right thing rather than believing in a religion.

How did the early civilizations progress? The hunter-gatherer bands composed of 4 to 6 families began to unite in tribes, which slowly evolved in structures more complex with an initial number of more experienced men as guides and later on with an organized government, or with an autocrat, or a "divine" king. The evolution of a language, a face to face contact, the possibility of a reciprocal help in the occasion of death or of a disaster, the definition of common goals were the main factors for the development of the Egyptian, the Babylonian, the Greek and the Roman societies. The domestication of the horse (3,000-2,000 B.C.), the invention of the wheel by the Sumerians (4,000-3,500 B.C.), the development of trade of goods and several agricultural and technological innovations usually permitted an abundance of food in the Near East, North Africa and Europe. Besides a few famines, gone were the periods of chronic starvation and although slaves and manual workers were exploited and badly treated, human life had improved to allow an expansion of the Mediterranean population up to about 100 million. It was unavoidable that, within a multitude of people, a few individuals emerged and a few could become potent leaders, like Caesar, or despotic and cruel like Emperor

Nero. Death, iniquities, the use of torture and a chronic indigence are the best ingredients to stimulate the thought that perhaps there is a supernatural Being that will offer a pleasant afterlife after so many injustices imposed during the earthly suffering. But even the pharaohs or various Kings believed that it was better, if not indispensable, to have the support of a friendly God.

When did humans start to kill each other? The archaeologist Fred Wendorf in 1982, at a place called Wadi Kubbania, in the Nile valley uncovered a 20,000 year old skeleton of a young man, who surely had been mortally wounded. It seems that when resources became scarce, as it happens today, conflicts became a norm. This is a negative side of evolution and it is a well known event occurring when the density of animals or humans becomes too high, so the strongest or wicked individuals overwhelm the weakest. The history of these early civilizations, not to mention what has happened after the advent of Christianity, is a continuous succession of either wars between neighbouring countries, or revolution and civil wars within the same country and Randolph Bourne, in the early 20th century stated that “war is the health of the state”. Somehow also the tragedy of wars, the loss of husbands and sons, and the violence against women must have contributed to the need of believing in a God more just and merciful than humans. **It becomes obvious to observe that the appearance of new genes (as many as 6,000 are expressed in the central nervous system) throughout thousands of years, while it has favoured cognitive functions, the intelligence, the memory, the consciousness in all of us, it has not been accompanied by a strong capacity of opening a dialogue over any difference of opinion, so that any dispute could be solved pacifically.** It remains to be seen by the future generations if evolution will try to correct itself by generating “benign genes” coding for tolerance and reasonableness. We have to realize that evolution, as any other natural process, is not necessarily perfect as otherwise in the medical field we would not have genetic anomalies, the autoimmune, the allergic diseases and the metabolic syndrome. As it will be discussed in Chapter 13, **there are significant differences between the woman’ and the man’s brain and it would be interesting to investigate whether the induction of any “benign genes” has already occurred in women but we have missed this advantage because of man’s notorious arrogance.** At any rate, evolution with its possible defects may have not produced a worse human being than the static creationistic generation. From the confused and anachronistic polytheistic Religions, from 500 years B.C. to 632 A.D., we shall now see the birth of the great monotheistic Religions.

Chapter 7

THE FOUNDATION OF THE GREAT MONOTHEISTIC RELIGIONS AND THEIR UNEASY PROGRESS DURING THE LAST TWENTY CENTURIES

I shall discuss the origin and evolution of the monotheistic religions following the time of their foundation: first, Buddhism, second Christianity, third Islamism and fourthly Judaism. All of these religions have been dictated by great men, who certainly were born leaders and acting as prophets. I will also briefly comment upon Hinduism, which is actually the oldest religion dating back to 5,500-3,300 years B.C. and is a polytheistic one.

A) **Buddhism**- Gautama Buddha lived in the North East of India between 563 and 483 B.C. He was the son of a local King but his conception happened when his mother, Queen Maya had a dream of a beautiful white elephant coming down into her womb to be interpreted as a sign that a universal emperor was to be born. The birth was also miraculous because the child was easily delivered with the mother holding on to a branch of a sala tree. A few days later, Asita, a great ascetic recognized that the child will become a Buddha, i.e., an Enlightened One. The boy, called Siddhartha grew up as the son of a royal family and, for almost thirty years, he enjoyed a life of opulence and luxury; when he was 16, he married Yasodhara, a beautiful princess, who later on bore him the son Rahula. By the time Siddhartha was almost thirty and was going to be enthroned, he felt the need to come out of his palace and see how people lived in the streets. He met an old man, an invalid and saw a corpse realizing that we age, we become ill and then we die. Luckily, he also met a beggar and an ascetic and immediately his mind was illuminated to decide to abandon his useless life, to renounce the throne and lead an ascetic life trying to alleviate human suffering. He escaped from the palace and, for the next 5-6 years, he experienced various approaches to reach the perfect illumination. During this period, he studied the hinduistic doctrine, he fasted and travelled, and he practiced meditation but realized that it was not enough. With five companions, for many months, he tried the practice of intensive self-mortification, but again he realized that excessive fasts weaken strength and do not allow achieving a true insight. Then alone and weak, in a park near Benares, he sat beneath the sacred Bodhi tree of wisdom (*Ficus religiosa*), for acquiring the true knowledge. During this phase, he was tempted by demon Mara (Bringer of death), who is similar to Satan of Christianity, but he resisted to even his three beautiful daughters. During several weeks of deep meditation, he could analyze his past life and understand the eternal cycle of birth and death of all human beings. He identified **the Four Noble Truths**: 1) there is a mental and/or physical suffering in the world. 2) The suffering is due to an exaggerated attachment to one's desires. 3) Only by

eliminating the attachment, one can eliminate suffering and 4) the method for eliminating the cause is indicated as **the Noble Eightfold Path**. This includes eight steps: a life of wisdom, (right views, right intent), ethical behaviour, (right speech, conduct and livelihood) and finally mental discipline, (right effort, mindfulness and concentration). Not all Buddhist sects use the same approach but the most coveted one is a deep meditation. He discovered that sentient humans are potentially able to reach enlightenment. At the age of about 36, Siddhartha attained perfect illumination and became a Buddha. The Supreme Cosmic Spirit, Brahma in person, begged him to preach the law and, for the following 45 years, Buddha travelled around the plain of the Ganges River and untiringly, taught his wisdom about the force of love and the nullity of human ambitions and desire. Apparently he performed many miracles, converted many people and asked his disciples to spread the word. At 80 years old, he realized that his journey was completed and, while meditating, he passed into Nirvana. Buddha was cremated in the month of May of 483 B.C.

Buddhism is appealing for a number of reasons: it appears to be more a form of psychology, free of prescriptions or authoritative rules and indeed Buddha, before dying, said that “you must each be a lamp unto yourselves”. There is no need to appeal to any God or a Saint and the evidence of its effectiveness must be searched by the individual. If one can follow the indicated path, one can achieve a fulfilling and happy life. As it can be expected, some variations of the central theme have been introduced by different sects but, fundamentally, Buddhism has remained informal and almost free of complex rituals. Temples are also simple and allow a deep meditation. Monks including nuns lead a humble life and, as Buddha himself showed, rely on donations by local communities. Today 98% (373 million) of the world’s Buddhists live in Asia and another 6 million live mostly in Canada, USA and Europe. Although Buddhism has always predicated pacifism, selflessness and respect among the different faiths, it has not been always peacefully accepted: the Tang Emperor Wuzong in China, in 842 A.D., persecuted monks and nuns and destroyed thousands of monasteries. Even worse, since 1949, the Chinese communists have suppressed Buddhism in Tibet and created an impossible life to Tibetans. I very much hope for His Holiness, Tenzin Gyatso, the 14th Dalai Lama and Tibetan people that torture and famine will end as the Chinese Government hopefully will revise its wrong aptitude.

I always have been a profound admirer of Saint Francis of Assisi, the founder of the Franciscan Order or “Friars Minor”, who lived in Italy from 1182 to 1226. As a young and wealthy man he enjoyed life, women and good wine, but, after a military expedition and a serious illness, he underwent a spiritual crisis at 23 years old. After that, for the next 21 years, he dedicated all his energies to help the poor and the humiliated and taught us to protect all animals, particularly the ferocious ones. Poorly dressed and bare footed, he began to preach repentance and he even

suggested, to no avail for the Papal Court, to live more humbly. As far as I can imagine, he had so deeply felt the pain of Christ's crucifixion, to receive the gift of His five wounds, known as the Stigmata and, noteworthy, nobody knew about this until after his death. He was pronounced a saint by Pope Gregory IX on July 16, 1228, who laid the foundation stone for the famous Basilica of Saint Francis in Assisi. I apologize for this digression but, although I do not believe in the reincarnation, I have often thought that perhaps Buddha lived a second life in Francis.

Finally, regarding Buddhism, the dogma of his conception is unacceptable and I would like to suppose that, in these days, my heretic thought is shared by some Buddhists. As the same story applies to Jesus, one has to believe that the birth of these prophets ought to be imagined physically and morally pure, although this is biologically impossible and irrelevant.

B) Christianity

As far as it can be judged from the number of books and articles written about Jesus, it appears that this is one of the most controversial topics that have ever been discussed. In fact some scholars even doubt the historical existence of Jesus and prospect Him only as a mythological prophet: however the four canonical Gospels of the New Testament by Mark, Matthew, Luke and John, as well as the Pauline Epistles (Corpus Paulinum), although written many years after Jesus's death, appear reasonably reliable and personally I feel that He really existed and died on the Golgotha hill. Jesus of Nazareth, also referred as Jesus Christ (Christ corresponds to the Hebrew-derived "Messiah"), lived in Galilee from about 8-2 B.C. to 29-36 A.D. The majority of Christians believe that Jesus is God incarnate, born in Bethlehem of Judea to Mary, a virgin, by a miracle of the Holy Spirit. The Gospel of Luke (1:26-38) reports that the angel Gabriel told Mary, married to Joseph, that she had been chosen to bear the son of God. Although it has a little significance, it seems that the genealogy of Jesus goes back to Abraham and to Adam. The number of generations, even if numerous, does not support the idea that Adam's birth may have happened 4,000-5,000 year B.C., in clear disagreement with the appearance of Homo sapiens in the Middle East. It has little relevance to go into details because anything can be proved. According to all four Gospels, Jesus came into this world to "give his life as a ransom for many". It is doubtful that Jesus helped the adoptive father as a carpenter because it looks more probable that he was a Jewish teacher. John the Baptist, who had been preaching for some time, baptized Jesus, who, after rising from the water of the Jordan River, "saw the heavens parting and the Spirit descending upon Him like a dove" (Gospel of Mark, 1:10-11), while a heavenly voice said: "You are My beloved Son, in Whom I am all pleased".

The Gospel of Matthew (4: 1-11) reports that Jesus, about thirty years old, after his baptism, was led into the desert by God, where he not only fasted for forty days (how could he possibly survive?) but resisted to all the devil's temptations, so that angels could nourish him at the end of this trial. Following this hard experience, the Gospel of John says that Jesus preached for three years followed by twelve Apostles and other disciples. He performed a few miracles and even resuscitated the dead Lazarus (John 11: 1-44). He must have been a born teacher and a charismatic leader: He taught the necessity of repentance, the love for God and for all people and the risk of an eternal damnation. It is easy to understand why Jesus attracted thousands of people because in those days, Judea and Galilee were dominated by the detested Romans and the natives were grouped often in antagonistic sects, such as the Pharisees, the Samaritans, the Essenes and the Zealots. Moreover ill and poor people, abandoned children, ethnic outsiders or outlaws, women forced to prostitute, slaves and beggars were ready to listen to Jesus, who offered a reason for living and the hope of immortality. At that time, as it is today, theft, murder, wickedness, deceit, fornication and adultery, envy and foolishness were frequent events and Jesus was urging a moral transformation. A prestigious man, who, during his sermons predicated the forgiveness of sin, love for one's enemies and insured that only loving God and living honestly, one could save the soul and gain a happy afterlife, was obviously a wonderful magnet for destitute people. With the passing of time, Jesus knew that his ministry was near the end and, according to the synoptic Gospels, with His beloved Apostles Peter, John and James went to pray at the top of a mountain. On this occasion, He was transfigured and, while Elijah and Moses' shadows appeared near him, they heard the voice of God saying again: "This is my beloved son, with Whom I am well pleased" (Matthew 17: 1-6).

During the Passover festival, about 30-36 A.D., Jesus, with all his followers, went to Jerusalem and later that week, Jesus celebrated the Passover meal with his Apostles and prophesied that he would be betrayed and executed. It was during this "Last Supper", magisterially painted by Leonardo da Vinci, he took bread and wine saying "this is my body which is given for you" and "this cup which is poured out for you is the new Covenant in my blood"(Luke 22:7-20). With these words, He introduced the Eucharist, the Christian sacrament in which bread and wine are consecrated and allow remembering Jesus' sacrifice, thus freeing the Christian from sin. After the supper, Jesus and the Apostles went into the Garden of Gethsemane and here, according to Luke (22:47-52), guards, sent by the order of the high priest, Caiaphas, arrested Jesus, who, if the history is right, had been betrayed by the apostle Judas Iscariot. According to Andrew Cockburn (2006), an ancient text lost for 1700 years reports that Christ's betrayer was his truest disciple: if the text is not false, Jesus himself purposefully asked Judas to denounce him because He, absolutely wanted to be prosecuted and begged him to accept this dreadful responsibility. This revelation appears sound to me because Jesus would

never have hidden himself and therefore He did not need to be identified by the infamous Judas's kiss. Even more convincing is the fact that Jesus knew too well that, without sacrificing His life, all of His preaching and fervour in saving mankind would have been lost. Who knows if all this staging had not been purely invented?

When the high priests, during the Sanhedrin Trial asked Jesus: "Are you the Son of God?" He replied: "You say that I am", thus accepting to be condemned for blasphemy. Then Jesus had to be judged by the Roman Prefect Pontius Pilate on the accusation of sedition for claiming to be the King of the Jews. Jesus readily admitted: "It is as you say" but Pilate, either because he did not consider Him a political agitator or/and because he wanted to be lenient at Passover, asked the crowds to decide who should be crucified, between Jesus and Barabbas (a true insurrectionist against Romans). When the crowd favoured the liberation of Barabbas, Pilate has thus remained famous for washing his hands (*lavabo manis!*). The burning question that has been asked many times is: why did Jesus have to die? It is very obvious that Jesus, in His mind, absolutely wanted to be crucified and die because this was the only coherent way to triumph over Satan and rescue mankind from evil. Only His extreme sacrifice could atone the sins of humanity and achieve the reconciliation with God: the orthodox Christians believe that only His death could fulfil the biblical prophecy including his Resurrection, the Ascension into Heaven and the Second Coming in the company of the Mahdi as it is also believed by most Muslims. It is predicted that this event will happen on the day of Apocalypse, once the earth has become full of injustice and sin.

On the third day after His crucifixion, Jesus rose from the dead and according to Matthew (28: 1-10), an angel, or two angels (Luke 24:4) announced His resurrection to the women, who wanted to anoint His body. Mark (16:9) wrote that Mary Magdalene was the first to see Jesus, who is said to have appeared later on to some 500 persons including, but only in vision, to Paul of Tarsus. Forty days after death, it is said that Jesus ascended to heaven concealed by a cloud. According to Matthew (24: 36-44), Jesus promised to come back to earth foreshadowing the resurrection of humanity. Therefore we have been warned that all living and the dead will be judged and, on the basis of our behaviour, we will be elected either to Heaven or condemned to Hell.

Philosopher Bertrand Russel attributed a great value to Jesus' teaching and compared Him to Buddha and Socrates. His Holiness, the 14th Dalai Lama regarded Jesus as a Buddha for preaching a doctrine of love and compassion. Thomas Jefferson in "The Life and Morals of Jesus of Nazareth" praised Jesus' ethical teachings. Hindus generally praise Jesus and some think that He was a wise guru not to be identified with God. Mahatma Gandhi valued Jesus, particularly for inspiring the Nonviolent Resistance and said: "I like your Christ; I do not like your Christians. Your Christians are so unlike your Christ". I learnt Catechism of the

Catholic Church when I was about seven and I still believe that He existed. He was a great teacher and thought it was necessary to donate His life for our salvation. It has been very hard to change my view but my work and my human experience has led me not to believe in dogmas, such as the miraculous conception, reported also by Buddha's mother, and the validity of the Eucharist that, as it has been conceived, it is a sort of too easy and cheap redemption.

I have come also to neither believe in the doctrine of the Trinity, nor in Christ's resurrection and nor in His Second Coming for the final resurrection. The following events, occurred during the last 2,000 years, indicate a tormented evolution of Christianity: some of the Apostles and disciples travelled from Galilee towards Rome and, whenever possible, established Christian communities in Antioch, Alexandria, Ephesus, and Corinth. Christianity, as a religion of deep personal significance, was not well accepted in Rome and, after the Great Fire in July 64 A.D., Emperor Nero found it convenient to persecute and martyr the Christians. Several times they faced death with great courage in the Coliseum in Rome, where they procured a terrible sight being killed by wild beasts. They were unjustly accused of disloyalty towards Roman Authorities and of hate towards mankind, whereas, particularly during the first three centuries, they paid homage to the Emperors and were kind and charitable towards everybody. Nonetheless persecutions were periodical and reached their worst under Marcus Aurelius (177 A.D.), Decius (250 A.D.) and Diocletian (303 A.D.) especially in Rome, Egypt, Syria and Turkey. The Christian Catacombs in Rome were mysterious and fascinating galleries underground: they were at the same time a cemetery for the martyrs, a potential refuge, and a place of prayer and hopes for a better future. As historically it has always happened, martyrdom enhanced the diffusion of Christianity and increased the fervour and enthusiasm of the new followers. A number of favourable circumstances induced Constantine I (324-337 A.D.) to end the persecutions and establish religious freedom through the Edict of Milan in 313 A.D. and treasures confiscated to other cults were donated to Christian Churches. Emperor Theodosius I in Thessalonica on February 27, 380 A.D. issued an edict establishing Catholic Christianity as the official state religion of the Roman Empire and abolished the pagan Roman religion. After his death in 395 A.D., the empire became permanently divided into western and eastern halves. After these changes, the Church gained political power but, expectedly, moral freedom tended to decline. Christian doctrine became oriented to eradicate sin and on the basis of this new outlook, Church Authorities justified the use of repression "in the name of God". Although the abdication of Emperor Romulus Augustus in 476 A.D., when Rome fell under the Goths, marks the end of the western Roman empire, both the Bishops of Rome and Constantinople kept Christianity alive. Meantime religious suppression against heretics began to be as brutal as the vicious purges against Christians during the time of Diocletian.

Owing to the dominance of the Greek language, culture and population, the Eastern Roman Empire became known as the Empire of the Greeks, or Byzantine Empire. It ended on May 29, 1453 with the death of the last Emperor Constantine XI and the conquest of Constantinople by the Ottoman Turks. From the foundation of Constantinople (the ancient Byzantium) in 667 B.C., the Byzantine Empire was shaken by an unbelievable cycle of invasions, rebellions, defeats and reconquests. I have come to wonder how much ordinary people must have suffered and how relevant the influence of Christ's death has been. It cannot be forgotten that a plague between 542 and 594 A.D. halved the European population and, if possible, even worse, the Western and Eastern Catholicism started to disagree along doctrinal, theological, linguistic, political and also petty problems to reach the Great Schism in 1054 A.D., when Pope Leo IX excommunicated the patriarch of Constantinople and the latter anathematized the Pope. Moreover, after the Fourth Crusade (1200-1204), in which crusaders sacked and occupied Constantinople, the hostility between the two churches became worse. Only in 1965, the mutual excommunication was removed by Pope Paul VI and Patriarch Athenagoras and now the actual Pope Benedict XVI has promised to pursue a total reconciliation.

The initial medieval time already showed the fragility of the Catholic doctrine but darker times had yet to come. Not less than nine Crusades, from 1095 to 1291 A.D. were approved by the Roman Church in the attempt to arrest the Islamic invasion towards Jerusalem. In 1063, Pope Alexander II granted both the papal *Vexillum Sancti Petri* and an indulgence that guaranteed immediate remissions of any sins to soldiers or mercenaries, who may have died in the battles against the Muslims. The greatest deed was to die fighting for the Christian cause. Unfortunately this concept has been adopted by Muslims, who have embraced the jihad. In hindsight, the Crusades set a bad example because the military activity and Christ's teaching to "love ones enemies" and to "turn the other cheek" were in clear contrast and the Holy war has created an open wound because it displayed intolerance in the name of God. Even if the Catholic Church has admitted this mistake, episodes of brutality, cruelty and greed were reported during the Crusades, not to forget the massacres of Jews in Europe. All of this is not justified by a transitory recapture of Jerusalem or for maintaining a Christian hegemony. Violence cannot be ever excused whether in the twelfth century was in the service of Christ, or to assert Muslim's ideals today. Ironically the Crusades brought economical and political advantages and it is sad to realize that history repeats itself and we have never learnt that we could gain more without wars.

Pope Gregory IX, in 1235 A.D., enforced the laws, enacted by his predecessor Innocent III, dealing with the detection and prosecution of heretics throughout the Countries dominated by the Christian Church. The Inquisition simply means "inquiry" but the processes were long and severe without any possibility of defence or outside help: penalties could include torture, burning of witches, Jews,

freethinkers, or anyone opposing the Christian belief or practice. The Medieval Inquisition occurred between 1235 and 1400 and sexual perversion, infanticide, mockery of Christian symbols and rituals as well as Satanism were prosecuted. It has been said, hopefully as an exaggeration, that, during six centuries, many millions of people were found guilty and punished in Europe, Mexico and South America. The victims may have been even more than the six million Jews perished during the Holocaust. When Napoleon entered Madrid in 1808 he was able to suppress for a while the Inquisition that today has been substituted by the Sacred Congregation for the Doctrine of the Faith. While some people were really sinful, it remains arguable if the Church was entitled to try and condemn people to death. There have been a few but famous cases such as Jeanne d'Arc (1431) and three Dominican Friars: Girolamo Savonarola, Domenico da Pescia and Fra Silvestro, who were tortured, hanged and burned in Florence in 1498. Another priest, Giordano Bruno, after an imprisonment of seven years, was burned alive in Rome on February 17, 1600, on the basis of eight accusations, the last one regarding the Virginity of Mary. I am glad to acknowledge that the Catholic Church has recently expressed "profound sorrow" and the error to condemn to death Giordano Bruno. The Dominican Order has also judged unjust the execution of Savonarola although his beatification has been opposed by Jesuits. The father of modern physics and the pioneer of the inductive methodology for scientific inquiry was also accused of heresy in 1633: Galileo Galilei had to face the Roman Inquisition during a long trial and he had to abjure his discoveries about Science and Faith, especially regarding his heliocentric idea because the Church considered a "formal heresy" that the Sun was stationary. He was lucky because he was allowed to spend his last years under house arrest in Florence.

The papal Inquisition proved practically ineffective against the Protestant Reformation, when in 1517, Martin Luther nailed his 95 Theses to the door of the Whittenburg Cathedral protesting against the Roman Catholic Church. In reality the Avignon Papacy (1308-1378) and the schism (1378-1416) have been the premonitory sign of a profound crisis of the Western Church. The first signs of impatience came from John Wycliffe at Oxford University and John Huss at the University of Prague. Both were condemned and executed after the inconsistent debate at the Council of Constance (1414-1418) but their death did not prevent a further deterioration. The corruption of the monastic system, the failure of conciliar reform, a cultural debate about the fundamental religious values, the calamities of recurrent pestilences have stimulated new ferments and the need for serious revisions regarding the nature of the church and the authority of the Pope. Thus the debate on the sale of indulgences promoted by Pope Leo X, denounced by Luther for restoring St. Peter's Basilica in Rome was the last straw that broke the camel's back. It would have been better to leave St. Peter's to fall to pieces rather than giving the indulgence for money. How an elected mind can do such a trivial mistake? The discontent about the Catholic Church had become so vast to include,

among the Reformers, Huldreich Zwingli and John Calvin in Switzerland and Hungary. Under Henry VIII, the Church of England separated from Rome during the period from 1529 to 1536. The fire that had remained for a long time under the ashes exploded with unexpected violence against the Catholic Hierarchy and many Catholics were slaughtered at the hands of Protestant bands in Germany, while in Scotland, some of the followers of the Reformed Faith were burned alive by devout Catholics in 1558. Desiderius Erasmus Roterodamus opened the humanist's age and objectively criticized the clerical follies and abuses. He was a very cultured and equilibrated man and he maintained that a true religion is a matter of inward devotion rather than futile and superficial ritual or ceremonial symbols. In spite of being sympathetic with the main point of Lutheranism, he could not find a common ground with Luther. Thus, in the 16th century the so-called Magisterial, because supported by magistrates, Reformers changed completely the relevance of the Roman Catholic Church north of the Italian Alps and, as many as fourteen new religious movements, some more radical than others, developed with various successes and are still active. As an example the Puritan movement objected to ornaments and ritual such as sumptuous and expensive vestments that are the rule in Italian churches as "popish pomp and rags". Surplices and genuflection were also considered as idolatrous. Certainly St. Francis beautiful simplicity and modesty have been thrown away. I admit to find the Catholic Church, especially in Rome, too pompous but this is due because in Italy to these days, it remains so important to create a good impression on the tourists that every Sunday flock together in the baroque St Peter's Square to receive the Pontiff's Benediction.

Eastern Christianity has also undergone a subdivision in: Eastern Orthodoxy, Oriental Orthodoxy, Syrian Christianity and Eastern Catholicism. Quite honestly, I find somewhat ridiculous that, after many centuries, the Roman papal primacy still represent a "thorny problem". Similarly, although the visit of Pope Benedict XVI to Ukraine has been judged "untimely" it seems that relations between Catholics and Ukrainian Orthodox are now "warming".

In recent times the Catholic Church has been accused of supporting Adolph Hitler, but, as far as I know, this is incorrect. Hitler was a Roman Catholic but he didn't believe in Christianity. It is true that Pius XI, in June 1933, signed a concordat between Nazi Germany and the Vatican. Pope Pius XI had also signed the Lateran Treaties with Benito Mussolini in 1929 but these were indispensable political acts to define the Vatican City and avoid anti-Catholic retaliations. Pius XI was very anti-Communist because of the unceasing Communist persecutions of Christians in the Soviet Union and when he tried to smooth the opposition, Stalin's reply was: "The Pope-how many divisions has he got?" The Church has always condemned anti-Semitism and all racism and in fact the Vatican's relationship with both Mussolini and Hitler worsened after 1935. It must be added that the number of Jews saved by the Catholic Church during WWII amounted to about 800,000 that

is far above other Jewish relief organizations in that period. In welcoming Benedict XVI, the World Jewish congress noted “the great sensitivity to the Jewish history and the Holocaust” of the new Pope but I found sincere, but inappropriate, the criticism of “an inherited anti-Judaism present in the hearts of not a few Christians”

After the meeting in Autumn 2006, between Pope Benedict XVI and the Archbishop of Canterbury and spiritual head of the Anglican Communion, a common Declaration still acknowledges “serious obstacles to our ecumenical progress”

The reader may well think that I have only superficially discussed the many problems encountered by the Christianity throughout 2,000 years. *Errare humanum est*, means “to err is human”. Everybody makes mistakes but it is regretful that illuminated clergymen have made too many. It is good to admit these mistakes and to ask forgiveness but it would have been better to operate more wisely. In the world, Christianity includes about 2.1 billion people but it has become much fractionated. This is positive and means that people use their brains and not hesitate to follow other religious paths. It appears extremely important that the clergymen and clergywomen, unfortunately in limited number, keep up with the continuous change and perspectives of modern societies. If they are unable to keep the pace of the changes and adapt to societies need and request, they will unavoidably lose contact and will become useless. (Chapter 15).

C) Islamism

According to Islamic traditions, Muhammad (570-632 A.D.) was a trustworthy and honest merchant and when he was 25, he married Khadijak, a widow, who bore him at least one daughter. It was a long and happy marriage but when she died, he remarried several times. He often retreated to Mount Hira, in a cave, near Mecca, where he fasted and prayed. In 610 A.D., when he was 40, or about 575 years after Christ’s death, the archangel Gabriel visited him in the cave and he received revelations from God (Allah). These revelations, with some intermissions, continued until his death, 23 years later and were recorded in a book known as the Qur’an, which became available after his death. Muslims regard Muhammad not so much as the founder but rather as the restorer of the original faith of Adam and Abraham, whose faith had been corrupted over time. Abraham is revered by Muslims as one of the most important prophets of Islam and is thought to have built the Kaaba, the Holy Mosque in Mecca. According to the Scriptures, Abraham was born in 1812 B.C., i.e., 1948 years after the biblical creation, hence 2,382 years before Muhammad.

After the Qur’an had been written, Muhammad preached a strict monotheism and warned his followers and the crowds that all humans must behave honestly as they

will be evaluated on the day of Judgement. It has been reported that the revelations were accompanied by him having mysterious seizures. To me, as a physician, this abnormal state may have been caused by an excessively inner mental concentration, when he received the revelations from the archangel Gabriel. In 620, Muhammad experienced a miraculous journey and spoke with Abraham, Moses and Jesus.

As all the Great Prophets, after 613, he had a very hard life because hostility had arisen between the tribes in Mecca and Medina where he became a respected statesman. The conflict with the Meccans went on for several years and Muhammad had to become a military leader and risk his life in several battles. However in 630, Muhammad was able to march on Mecca with a huge army and the Meccans converted to Islam. He established the Muslim pilgrimage to Mecca where the Kaaba was converted to a Muslim shrine. After his death, his successors united all Arabia and by 750, Islam was already a great military power and had conquered Iran, Iraq, Egypt, Palestine, Syria, Armenia, North-Africa and Southern Spain. There is a general consensus that Muhammad, besides having dictated the Qur'an and having become the Apostle of God, was a virtuous man, a political leader able to create a new nation by unifying various Arabian populations.

Is Islamism theology very distant from Christianity? The Qur'an holds that Jesus was born without a biological father to the Virgin Mary, by the will of God. He is also valued as a great prophet and the Messiah predicating non-violence, respect towards humans and animals and avoiding sin. However Muslims do neither believe that Jesus had a divine nature, nor was the son of God, thus denying the Trinity. As Islam does not accept any human sacrifice for sin, they don't believe that Jesus was crucified. They believe that Jesus will return to this world with the Imam Madhi to defeat the Dajjal, on the day of Apocalypse. However, in spite of similarities, there have been rage and resentment between these two Religions.

One of the reasons for writing this book has been the evaluation of dissent or war among religions. This is absurd because all religions teach to love each other and be tolerant, but in practice religions behave as opposed political parties and become belligerent: mixing religion with politics is another big mistake although often one has to choose the lesser of two evils. Pope John Paul II was seriously wounded by a Turk probably because the Polish Pope was anti-communist and his politics irritated the Communist block during the Cold War. The worst contrast between Christians and Muslims was at the time of Crusades (1096-1291). In 1453, Ottoman Turks conquered Constantinople, the capital of Orthodox Christianity. In Spain, in 1492, after bloody fighting's, King Ferdinand drove out the Moors and moreover he expelled the Jews. In 1683, the Ottoman failed to conquer Vienna and this defeat marked for a long time the end of the Islamic expansion. It was only in October 28, 1965 that the Vatican, by issuing the Declaration *Nostra Aetate*, firstly auspicated by Pope John XXIII, had the wonderful idea to dedicate a document to

“non-Christian Religions” for establishing friendship between Christianity, Islamism, Judaism, Hinduism and Buddhism because, in spite of theological differences, these religions invoke the name of a single God. Assuming that really there is a God, immaterial, omniscient, omnipotent and merciful, there cannot be a Christian, as well as a Muslim or a Buddhist God. The fearless Pope John Paul II forgave his potential killer and in 2001, for the first time, he visited a mosque in Damascus (Syria). After the declaration of independence of Israel in 1948, the tension between the Jewish state and Palestinians became progressively worse with periodic wars, until we arrived at the tragedy of New York City on September 11, 2001. Benedict XVI started with the wrong foot when on September 12, 2006, at the University of Regensburg linked Islam to violence. As a matter of fact, the citation of Manuel II Paleologus was unnecessary because the New York’, London’ and Madrid’ tragedies, just to cite a few recent episodes, were more than enough to demonstrate that a marginal, yet dangerous, minority of Muslims was not behaving as clearly established by the Prophet Muhammad, who “emphatically forbade the killing of women and children”, According to a hadith: “people who neither take part in a battle nor are able to take part in it-as per the dictates of custom as well as sense and reason-should not be killed”. Successively, when Benedict XVI visited Turkey, a dialogue with the Ecumenical Patriarch Bartholomew I begun and this must continue with objectivity and the aim at attaining a reciprocal respect and understanding. I am much less hopeful that we can eliminate the suicide bombers or other terrorist acts by force, rather than discussing the reasons of this war and the absolute need of solving the problem for both the Palestinian and Israelite people. The jihad in Islamic term means struggle and can have different meanings such as either conducting a virtuous life, or trying to spread and defend Islam, or to fight injustice and oppression. Although Muhammad had to fight for defending and propagating his Faith, He always acted with justice and according to the Qur’han. While he tended always to exclude violence, there is now an armed struggle and terrorist acts that aim at eliminating oppression by killing innocent people. This approach is wrong and it has been going on for too many years yielding only death, sorrow, revenge and poverty. Diplomatic attempts have failed for political incapacity or/and inability or/and unwillingness to understand and correct striking social inequalities. Everyday I feel very upset for what is happening in the Near East and in Chapter 14, I will try to present my view to both Palestinians and Israelites because all of them have a right to live in that area and they must find peace.

D) Judaism

From what I read, Christianity, Judaism and Islamism are known as “Abrahamic religions”. The patriarch Abraham appears to have been the father of these three religions although today there are unbridgeable differences among them. It is said

that Abraham died at 175 and, if this is true, it is a world record. It is also said that Abraham had his first son at age 86, when his wife, the barren Sarah persuaded him to sleep with her young slave Hagar, who bore him Ishmael. Then, according to the Hebrew Bible, at 90 (?), Sarah, who apparently was not sterile as it had been thought, bore him their only son Isaac, who was circumcised when he was 8 days old and initiated this tradition. As the Torah reports, God made a pact with Abraham and directed him, to “cut my Covenant in your flesh”. After Sarah died, Abraham married Keturak and God blessed them with six more children. The first son of Abraham, Ishmael is considered the Father of the Arabs, whereas Isaac, the second son, is called the Father of the Hebrews. It seems strange that Muslims and Hebrews, though generated by Abraham and lived in the same countries often in good agreement, are now implacable enemies. It would be positive to calmly evaluate the reasons, which are most likely political and economical, that led to the present situation and try to find a satisfactory solution for both people.

At least from the theological point of view, Judaism is strictly monotheistic and the most important belief is in a single, omniscient, omnipotent, omni benevolent, transcendent God, who created the universe and continue to control it. The laws and commandments of Orthodox Judaism, reported in the Torah and in the Talmud are extremely clear; anyone who does not accept the 13 principles is potentially heretical. After the Israelis had been enslaved in Egypt, God sent Moses to redeem them: after the Exodus, God led the Israelis to mount Sinai in 1313 BC, gave them the Torah and around 1200 BC, they settled in the land of Canaan. Rabbi Haim Druchman, a Knesset member, says that “our connection to the land goes back to our first ancestor. Arabs have no right to the land of Israel”. While I cannot comment on this crucial matter, I believe that also Arabs lived in Palestine.

After Solomon’s death, the Kingdom of Israel was halved into the Kingdoms of Israel and Judah. Successively, both kingdoms were submitted to either Assyria or Babilonia and many Israelis were kept in captivity for many years. When they returned to their homeland, they fell under the Roman rule and, when they revolted against Roman domination, Jerusalem was destroyed in A.D. 66. During the middle Ages, Jews were either persecuted or expelled or socially restricted in ghettos. Over the past two centuries, Jews have divided in several ethnic groups with different denominations. The anti-Semitism culminated in the Shoah during WWII.

The Judaism view of Jesus is severe because He cannot be considered the son of God or part of a Trinity. Moreover it is stated that Jesus was a Jew born in Bethlehem, raised in Galilee and killed in Jerusalem by the Romans. He was neither a prophet, nor the Messiah because it did not fulfil the requirements set by the Torah. In spite of these ideas, Christianity has tried to reconcile with the Jews and to promote mutual respect.

E) Hinduism

This is the oldest religion and Hindus believe in a Supreme Cosmic Spirit, called Brahman, who is the Absolute Truth. The Hindu scriptures also speak about many other deities or celestial spirits and, in this sense, their religion became polytheistic. Brahman was not a founder and the Hindu religion results from a fusion of beliefs and traditions accrued for many centuries. It is the third largest religion and includes almost a billion adherents. It is a complex and fascinating religion somewhat similar to Buddhism and certainly cannot be described with a few sentences. The spiritual goal of life is to attain salvation and this can be accomplished even during our brief existence by neglecting worldly desires, demonstrating true unselfishness, and practising deep meditation in order to unite with God. Hinduism teaches that the soul, which is defined as immortal, can reincarnate and each time, by living a virtuous life, one may reach the Supreme Bliss or perfection, which breaks the cycle of reincarnation because one has reached the final stage of Nirvana. Some Hindus select the monastic life and both genders choose a life totally detached from worldly pleasures and dedicated to the contemplation of God. This is very good but how much can these monks contribute to the salvation of the people in general? I appreciate that these religious practices are very informal, that monks never seek to aggressively recruit converts and that the discrimination of castes including the untouchables is criminalized by the Indian Constitution and certainly by the Hindu religion.