bandwagon effect. This bandwagoning strategy has been evident in East Asian history before, and Huntington fears its return if the East Asian peoples perceive the U.S. as retreating from a global role of a primary balancing force to a rising China.

This book deserves some attention from the Muslim World largely because the author is influential in certain circles wherein Western policies are made. Although his ideas are being challenged globally as within the policy-making circles of the West, there is still need for concerted Muslim efforts to expose the fallacies of the argument presented in this work. Muslim countries should, however, avoid the problem of over-exposure of the Huntington thesis as a self-fulfilling prophecy. Many Muslim and non-Muslim countries in the Middle East and South East Asia have organized conferences and seminars to deal with part or all of the ideas contained in this volume. Because of its provocative nature and because of the intended and unintended consequences that such a scholarly work could bring to the life of Muslims individually and collectively, it would be an investment in prudential intellectualism for the English-speaking Muslims, especially those living and working in the West, to pay attention.

Sulayman S. Nyang**


If one were to define Bobby Sayyid's ground breaking post-structural treatment of some of the most important issues in the contemporary discourse on Islam in a few key words, these would be: fear, anxiety, Kemalism, modernity, eurocentrism and the perception of the 'other'.

The book draws upon a wide range of post-structuralist techniques to study the emergence of Islamism. It places opposite trends next to each other, pushes the limits of the reader's level of integrated thinking and brings into sharp relief the most important cause of destruction of Muslim polity in the twentieth century: Kemalism.

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For an avid reader interested in Islam, modernity and post-structuralism, this thought-provoking study is simply engaging. Contained within five short chapters — sandwiched between a prologue and an epilogue — is a process of creative thinking which shapes the contours of our understanding of the resurgence of Islam. This lucid treatment of the roots and the causes of a historical process which intimately involves more than one billion human beings and affects the lives of the other three billion — who see the transforming process of Islamism with awe, surprise, fear and anxiety — draws upon a wide range of sources to demonstrate the emergence of a new conflict in a historical setting: a conflict arising from the challenge to the notion that the 'West is best'. This challenge has been the result of a re-thinking which has involved the best minds of the twentieth century.

The book draws upon conventional as well as non-conventional sources: Along with recognized scholarship on Islam and the west, one finds quotations from that wonderful, blind and always fresh Argentinean who created a unique mythology of dreams and labyrinths, i.e. Jorge Luis Borges. Then there is the eclectic breath which comes from a multi-disciplinary approach to the subject: political thought, post-structural treatments, sociology, history, economics and literature — all contribute to the construction of a sharply focused study of a complex issue. The author sees in the emergence of Kemalism a deeper and richer meaning and constructs his post-structural edifice around the emergence of Mostapha Kemal's modernistic approach.

The author is primarily concerned with analyzing "the conditions that made 'Islamic Fundamentalism' possible". He is not interested in peculiar situations and specific aspects of the process, just in its broad outline: "Why political Islam and why now?... To account adequately for the emergence of Islamic fundamentalism requires the articulation of a ground in which the various manifestations and causes of 'Islamic fundamentalism' have a coherence that has a wider logic than any particular Muslim community. Such coherence could only be found in a conceptual narrative. The aim of this book is to provide such a narrative" (p. 5).

Perplexed by the rise of Islamism, Western (and some Muslim) scholars have seen this process as a 'response' to a set of external factors. Different 'factors' or 'set of factors' have emerged as a result of this treatment. Some would include or emphasize one particular aspect, others would exclude it or assign a less significant role to it. These so-called factors have included the failure of nationalist secular élites, lack of participation, crisis of petty bourgeoisie, petro-dollars and uneven
economic development and effects of cultural erosion. But these, according to the author, are not sufficient to explain Islamism.

In "Thinking Islamism, (re-)thinking Islam", the second chapter of the book, the author prepares ground for a fresh approach by demonstrating the pitfalls of the two approaches which can be labelled as "orientalism" and "anti-orientalism". Both attempt to restrict the discourse with labels which are inadequate. If Edward Said's *Orientalism* frames the discourse on Islamism in relationship to the monolithic caricature of Islamic phenomena by orientalism, anti-orientalists' attempt is to 'dissolve' Islam as an analytical category. As an example of anti-orientalist understanding, Sayyid quotes Hamid El-Zein who claims "that 'Islam', as a concept, is not sustainable, since the idea of 'Islam' presumes a positive content immune to local articulations" (p. 37). Refuting El-Zien, Sayyid writes:

The problem with El-Zien's account is that he believes by demonstrating the multiplicity of the uses of Islam he can refute the orientalist idea that Islam is one entity, and that by showing the great variety of Islamic practices he is making an argument against essentialism. Pluralization is not a safeguard against essentialism (pp. 37–38).

Sayyid identifies two major categories in which the role of Islam is misplaced in the anti-orientalist discourse: Islam as ethnicity and Islam as ideology. In the first category, Islamic identity is located in ethnic solidarities and conflicts; in the second, Islam is defined as a system of beliefs which in the final analysis is a reflection of socio-economic processes and struggles. "What anti-orientalism produces is a series of 'little Islams' reflecting the various economic, ethnic and social factors of the variety of Muslim communities", concludes Sayyid. "What remains to be devised is an account of Islam not reducible to these 'little Islams'" (p. 39).

And that is exactly what the author sets out to do in "Kemalism and the politicization of Islam", the third and the most important chapter of the book. This chapter contains one of the most significant accounts of Islamism. It is constructed on the foundation of three clearly stated strands: (i) The role of Islam as a master signifier after the death of the Prophet (peace be on him) and the centrality of Caliphate, (ii) emergence of Kemalism and its relation to Islam and (iii) Kemalism as a metaphor to describe the emergence of various regimes in the Muslim world in the post-colonial period.

The first strand is a perceptive account of the role of the Prophet (peace be on him) and the caliphate in the emergence of political Islam. During the life of the Prophet (peace be on him), there was no difficulty,
for the Prophet (peace be on him) himself was *the authority* which provided unity and a simple answer to the question of authority in Islam: the Prophet (peace be on him) himself was the first and the foremost representative of the message of Islam. He was the final authority in disputes of all kinds: religious, political, personal. He was not Islam, nor the creator of Islam but its best human representation. The Prophet (peace be on him) acted as the master signifier of the Muslim community. What he said and did was Islam. He was the ultimate authority whose decisions could not be challenged by any human authority or institution. Though he was not the lawgiver nor the law*** (p. 54) his deeds and sayings were manifestations of the divine message he had brought. The centrality of the Muslim community was associated with his presence.

His death marked the beginning of a major shift: the nodal point of the community shifted from the person of the Messenger (peace be on him) to his message (Islam). Accompanying this fundamental shift was the need to find new sources of interpretation of the message because the Messenger who had interpreted the message so far was no more present. These new sources were analogy, *qiyās* and *ijma‘*. But these were mere principles. The community also needed a person who could exercise authority and assume the role of an arbitrator; thus the need for the caliph (successor). The caliph was, however, not vested with the same authority as the Prophet (peace be on him), for he did not receive revelation. The caliph did not replace the Prophet (peace be on him), rather, he marked his absence.

The early Muslim community split on the question of succession, ultimately leading to a political split which has existed ever since. Thus the institution of caliphate did not have uncontested authority and eventually the caliph became a mere figurehead with real power being in the hands of his Khorasani and later Turkish *ghulams*. In 929 CE, a further split occurred when Emir Abdul-Rahman proclaimed himself caliph in opposition to the one in Baghdad. A new complication appeared when caliph Mu‘tasim was trampled to death in 1258 by the troops of Hulagu.

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*Perhaps in an attempt to over-simplify this correlation, Bobby Sayyid has called the Prophet the lawgiver. The Prophet (peace be on him) was not a lawgiver; merely its enunciator. Law was given by God. Likewise, it is historically incorrect to say that "the codification and collection of the Qur’an begins with the death of the Prophet (peace be on him), as does the collection of *hadīth*".*

*Sayyid uses the words "Law and lawgiver". I have chosen to use "Message" and "Messenger" (peace be on him) for the reasons stated in the previous footnote.*
Khan, leaving the Ummah without a caliph. But this was more or less rectified when the Mamluks in Egypt installed one of the Abbasid refugees as caliph. The caliphate passed on to the Osmanlis in 1517 when they defeated the Mamluks and conquered Egypt, though it took nearly two hundred years for the Ottoman sultans to assume a definite role as caliphs. In any case, for twelve hundred and ninety-two years, that is, from the death of the Prophet on 3 June 632 until the abolition of caliphate on 3 March 1924, the institution of caliphate remained a nodal point for the Muslim community. It was not always the central point for political authority but it remained a pivotal point for the structuring of the global Muslim community. This centrality of political Islam came to an end on March 3, 1924 when the Grand National Assembly abolished the caliphate. This initiated a period of decentralization of political Islam.

In a lucid account of this process, Sayyid has described the protracted and complex affair leading to the abolition of the Caliphate — an affair in which Mustafa Kemal was the major character:

The abolition of the caliphate ended the possibility of establishing an 'a-national' political space. The end of the caliphate also signalled the end of a struggle in which other possibilities of constructing political communities (pan-Islamism, pan-Ottomanism, pan-Turanism) were finally suppressed in favour of (Turkish) nationalism. Further, it was the sign of the ultimate fragmentation of Islam. It ushered in a new political terrain in which the Islamic presence in Muslim communities was confined to the private sphere, such as in systems of religious practices and in laws governing personal status... (p. 60).

The abolition of caliphate also necessitated establishment of a new ideology to construct the political identities. Kemalists employed four strategies: secularization, nationalism, modernization and Westernization. These four were interwoven concepts, for Mustafa Kemal saw secularization as a process which involved "not just the separation of the state from the institutions of Islam but also the liberation of the individual mind from the traditional Islamic concepts and practices" (p. 64).

"The Kemalists saw Westphalian model of the nation state to be the only legitimate and scientific form of a political community" (p. 65). This led to the emergence of Turkish nationalism which was promoted by Kemalists in the Turkish History Conferences of 1932 and 1937. Modernization went hand in hand with nationalism and the only form of modernization which was recognized by the Kemalists was Westernization.

"The impact of Kemalism", an important section in chapter 3, is a narrative account of the expansion of the Kemalist model to other areas...
of the Muslim world. The strength of this narration rests on the fact that Bobby Sayyid has extended the narration to the process of conceptualization which allows him to treat Kemalism as a metaphor. He further refines the thought process by identifying sub-themes of Kemalism: the Pahlavist strategy and the quasi-caliph strategy.

Within the broad anti-foundationalist epistemological framework of the study, Sayyid goes on to explain the relationship of Islam to these refinements and then concludes by suggesting that the literature reviewed in Chapter 1 of the book could be read as accounts of weakening of the Kemalist hegemony. Seen in this perspective, Islam becomes the initial master signifier and Islamism an attempt to re-articulate that master signifier; abolition of Caliphate re-activated Islam as a political discourse.

The dismantling of the Ottoman empire — both territorially by the European powers and ideologically by Kemal and his followers — produced the political terrain with which we are now familiar: a Muslim world fragmented between different nation states, ruled by modernizing (that is Kemalist) elites, which see Islam as being peripheral to the concerns of the state. Mustafa Kemal, by abolishing the caliphate, helped to sanction and to legitimize the idea that national identities encased in nation states are the only credible form of political community. Once the caliphate had been replaced by the discourse of Kemalism, it became possible to think about the need for an Islamic state (p. 78).

"Islam, Modernity and the West", the fourth chapter of the book, attempts to show how Islamism emerged as the most likely beneficiary of the failure of Kemalism. In the most lucid review of his position so far, Sayyid describes how Kemalism was the main stay of post-colonial Muslim nation states until the late sixties or early seventies and how it started to weaken thereafter. Kemalism weakened because of several reasons: it was never a unified system, at no point was it accepted by all, even within each country, there was a large difference in the degree to which Kemalism had been successfully implemented in different organs of the state (military, bureaucracy, etc.). But why did Islamism and not other alternates — liberalism, socialism, democratization, etc. — emerge as dominant replacements to Kemalism?

One way to explain this would be to find the common denominator between Kemalism and other alternatives such as liberalism. What is it that Kemalism and other discourses do not share with Islamism? This seems to be an impossibly huge question. Fortunately the secondary literature on Islamic fundamentalism provides a possible avenue of inquiry. When all is said and done, one of the most enduring descriptions of the conflict between Islamism and Kemalism is that it is a battle between modernity and its 'other'? (p. 88).
Here Bobby Sayyid introduces his second important figure: Imam Khomeini. Seen in this light, Khomeini, his political thought and the Iranian Revolution appear to be the most natural symbols of Islamism — which in turn is a process in opposition to Kemalism. Agreeing with the important conclusion of Sami Zubaida (*Islam, the People and the State*, London: Routlege, 1989, ch. 2) that Khomeini is not outside modernity, rather he only makes sense in the context of modernity, Sayyid discusses various studies which have attempted to place Khomeini outside modernity, but rejects them in favour of Zubaida's, which is based on Khomeini's political writings. The stress on people as the political force in Khomeini's political writings is the foundation on which Zubaida has constructed the theory that Khomeini is not outside modernity; it is modern political thought which has produced this notion. This means Islamism itself is a phenomenon of modernity. Sayyid concludes that "non-availability of rival discourses to Islamism cannot be explained in terms of modernity, or Islamism's relation with the modern is radically different from that of other discourses" (p. 97). Sayyid then goes on to state that there are two possible ways to proceed:

The first possibility would suggest that we must look elsewhere for the reasons why the crisis of Kemalism has met its most compelling response in Islamism.... The second alternative is to explore the possibility that the relationship between modernity and Islam cannot be one of total exclusion. Islamists may reject some aspects of modernity and embrace others, and, by working out what they reject and what they accept, we can draw up a matrix which allows us to distinguish between Kemalism, liberalism, socialism, etc. on the one hand, and Islamism on the other (p. 97).

Next he goes on to demonstrate that 'modern' is not equivalent to 'western'. In the section entitled "Modernity and the West: the West and the 'Rest'", Sayyid makes a convincing case by using a study edited by Stuart Hall and Bram Gieben in 1992 (*The Formation of Modernity*, Cambridge: Polity) in which they have argued that the West is not constituted as a single solid entity, rather it operates at a number of levels, in a number of discourses, performing slightly different functions... It functions as an analytical category which allows us to map out the world in terms of the West and the non-West. Second, it is a criterion by which we can make judgements about the rest of the world — both spatially and temporally. Third, it marks a frontier around which a number of positive and negative qualities are sorted and then gathered... one can easily see a logic of equivalence at work here, demarcating a frontier between the West and the 'Rest'. Finally it is a term that represents a particular way of life that
is developed, industrialized, urbanized, capitalist, secular and modern (p. 100).

Having demonstrated, rather convincingly, that 'modern' is not equivalent to 'western', Sayyid takes his argument further to reject the commonly held belief that postmodernism is a phenomenon of the most highly developed Western societies only. Citing Zubaidah, he points out that Khomeini is the only political thinker in the Muslim world since the 1870s who does not attempt to locate Islam within a tradition of "progressive history" and who does not use the apologist discourse which attempts to show that all major developments are actually inspired by Islam; or that Islam is compatible with science and democracy. "Khomeini writes as if western thought did not exist" (p. 114).

He concludes his argument by reiterating:

It is the deconstruction of the relation between modernity and the West that produced a space into which Islamism could locate itself; and it is this positioning that can account for its emergence as a politically significant discourse. The appeal and power of Islamist projects are due to the way in which they are able to combine the deconstructionist logic of the postmodern critique of modernity with an attempt to speak from another centre, outside the orbit of the West (p. 120).

"Islamism and the limits of the Invisible Empire", the last chapter of the book, opens with a pertinent quote from Foucault's *Archaeology of Knowledge* (London: Tavistock, 1986): "But if you claim you are opening up a radical interrogation, if you wish to place your discourse at the level at which we place ourselves, you know very well that it will enter our game and, in turn, extend the dimension that it's trying to free itself from. Either it does not reach us or we claim it".

This chapter looks at the heart of the issue: The main argument of the book is that Islamism emerged in the space created by the decentering of the West. But has the West been provincialized and relocated as one centre among many? Is it no longer the cultural formation that all other cultures must imitate? Has not the demise of Communism in 1989 ushered the West into its final triumph, as Fukuyama claims?

Quoting Khomeini, Sayyid rightly points out that both the Western and Communist models were in fact based on a common European philosophy of materialism. In a now famous message to Gorbachev, sent in January 1989, Khomeini had pointed out: "Your difficulty is the lack of true faith in God, the same difficulty which has also dragged the West towards decadence and a dead-end, or which will do so".
It is Islamism that has challenged eurocentrism. Because we have been used to the process of eurocentrism for so long (from 1870s to 1980 or so) it is hard to comprehend new basis for discourse — a discourse which does not take Europe and its philosophies as the nodal point; a discourse which merely treats Europe as one centre out of many. The concluding paragraph of the chapter quotes Fanon's memorable words: "The European game has finally ended, we must find something different". Perhaps Fanon was not wrong, only ahead of his time.

Muzaffar Iqbal


In a small town in the heart of rural America, in a relatively small laboratory, a micro organism is at work. In a first of its kind successful experiment, a scientist has just observed the reproduction of bone cells around a small piece of bio-degradable material which to the trained eye looks like a human arm. Cells are rapidly multiplying and within a few days, the actual bone will appear around the bio-degradable piece. The scientist goes to his computer and neuro cells in his brain move his fingers on the keyboard as he types words, announcing the news of his successful experiment. Within seconds, his words travel across the continent and beyond, via an invisible path which criss-crosses hundreds of channels and millions of megabytes of electronic data.

Artificial human organs, gigabytes of electronic data on the go, internet chat and innumerable other phenomena are transforming images of a brave new world, ushering us into the 21st century. Whatever else the new century may bring for the human race, it is bound to produce a new global culture in which the defining factor will be speed.

Now imagine: If you were the editor of a prestigious science magazine with inside knowledge of what was happening in various cutting-edge scientific disciplines around the world, would you not be tempted to foretell what would be discovered next? Perhaps the thought would not cross your

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mind until your son asks you: "If you're the editor of Nature, why can't you say what will be discovered next"?

Once the question has been asked, the process takes its natural course and one ends up with a fascinating book: *What Remains to be Discovered: Mapping the Secrets of the Universe, the Origins of Life, and the Future of the Human Race*. Those who had known Maddox through his previous four books, *The Spread of Nuclear Weapons* (1962), *Revolution in Biology* (1963), *The Doomsday Syndrome* (1972) and *Beyond the Energy Crisis* (1974) would be pleasantly surprised with this synthetic narrative which fully brings forth the enormous range of his interests, twenty-three years of experience as the editor-in-chief of *Nature* and by his self-restraint which is obvious from the very first chapter of the book, "Introduction: The River of Discovery" and is carried throughout the book:

This century has been so rich in discovery and so packed with technical innovation that it is tempting to believe that there can never be another like it. That conceit betrays the poverty of our collective imagination (p. 1).

Had it not been for certain broad statements which have totally ignored the achievements of "non-Western" sciences, the book would have been truly a remarkable achievement of the first order. But as it is, one wonders at the oversight of the rich and well-documented accounts of the achievements of the non-Western scientific traditions. Like many historians of science in the West, Maddox has also fallen in the same trap which devours all marvels of discovery between the resurgence of Greek science at Alexandria in the second century and the appearance of modern science. The cursory acknowledgement of the "contributions of the ancient Chinese, the extinct civilization of the Indus Valley, the Babylonians and the Greeks" hardly does justice to the rich and intricate achievements of the centuries before the modern era.

But, be it as it may, seen from the perspective of modern science and disregarding the issue of the legacy of "non-Western" sciences, one finds here a fascinating account of the achievements of the last three hundred years, leading to the twentieth century. Charting out the progress of science from the time of Copernicus, Maddox rightly points out that there would have been the same sense of wonder at the end of each of the three preceding centuries (p. 2). Looking back at the seventeenth century, an historian of science would be justified in boasting that there had never been a century like it since the resurgence of Greek science at Alexandria in the second century: Seventeenth Century — a century in which Francis Bacon brought his forceful argument in favour of experimentation; William Harvey dissected animals and people for "almost" the first time since Galen 1,200 years earlier, discovering the function of the heart, the arteries and the
blood. A century in which René Descartes produced the legacy of the system of geometry in the language of algebra — the Cartesian Geometry — and a century which saw the crowning achievements of Isaac Newton in the 1680s which showed "that the orbits of the planet were the result of an attractive force between the Sun and its planets" and ended up in the discovery of the Newton's law of gravitation which explained such diverse phenomenon as the attraction between Earth and the falling apple as well as the roughly spherical shape of Earth, the Moon, the planets and the Sun and stars. Newton's genius redefined our concept of the world; in his fascinating book now simply known as *Principia*, which first appeared in 1687, he summoned up the speculations of the previous two centuries and produced agenda for science for the next two centuries.

The next century was likewise full of discoveries. Newton had to devise a new mathematical technique, differential calculus, for calculating the orbits of planets and other trajectories. It was a clumsy technique but useful enough to engross a team of brilliant German and French mathematicians in its refinement. But while this was happening, a fascinating new area of science had opened up revolutionary vistas: Electricity and Magnetism. The discoveries of this century changed, once again, our view of the world and its composition. We learned about the positive and negative charges, about the nature of lightning, forces of attraction and repulsion between charges and about the steady flow of electricity through metal wires. As if this was not enough, the eighteenth century also produced a series of technological advances which sent salesmen trudging across western Europe with their wonderful steam engines as replacements for traditional water wheels.

But it was the nineteenth century which could truly claim to be the century of wonders. Within the first two decades of this century of discovery, John Dalton, a teacher in the north of England, had firmly established that all matter is made of indivisible atoms, that there are only a few fundamental substances, which he called *elements* and that each different kind of atom has a different weight: hydrogen atoms are the lightest and carbon atoms are roughly twelve times heavier than the hydrogen atoms.

By 1851, James Prescott Joule had proven the doctrine that energy is conserved. Then came the revolutionary idea of Entropy, introduced by German Rudolf Clausius and the laws of thermodynamics. But perhaps, as the author says, the crowning "achievement" of the century was Charles Darwin's theory of the evolution of species by natural selection, published in 1858. Perhaps equally important was the conceptual difficulty raised by the wonderful Wave Theory of James Clerk Maxwell which explained all kinds of properties of light and other radiations: How could a ray of light,
or some other kind of radiation, keep on travelling long after its source had vanished? In other words, what "filled the empty space"? This problem took almost a quarter of a century to reach the notion of vacuum and our understanding of this wonderful void is still imperfect.

But nineteenth century could also boast of having produced Louis Pasteur who demonstrated the nature of bacteria and postulated his germ theory of infectious disease. Above all, the revolutionary discoveries of the last two decades of the century were unprecedented: Generation of invisible Maxwell waves in the radio-frequency range by Heinrich Hertz in the 1880s which would herald the era of global communication when Guglielmo Marconi spanned the Atlantic with these waves two decades later; the discovery of X-rays by Rontgen (1895); the discovery of radioactive elements by Antoine Bequerel (1896) and the discovery of electrons by J. J. Thompson (1897).

The century thus ended on a triumphant note. Not only had fundamental physics been reduced to a series of problems in mathematics that would in due course be solved, but the closing decades of the century were made prosperous by technology resting on science that was itself the product of the same century. The dyestuffs industry and the chemical industry more generally were the products of the atomic theory and what followed from it. The electrical industry (harbinger of the communication industry) had already begun to change the world. For science and technology, the nineteenth century was certainly the best there had yet been. Only now do we know that it was merely a beginning (p. 9).

And it was true, for in these closing years of the twentieth century, we can look back and wonder: what would be the nature of our understanding of the world had there been no Max Planck, Albert Einstein, Niels Bohr, Louis de Broglie, Erwin Schrodinger and Werner Heisenberg who would take science out of its self-satisfied citadel of certainty and open up a whole new arena of uncertainties which would eventually leave us scurrying for the "fundamental truths" which science had already seemingly solved?

From an historic perspective, perhaps the most revolutionary discovery of the twentieth century is DNA, that almost uniform and apparently featureless molecule that generates such a variety of living beings. "The structure of DNA ranks with Copernicus's successful advocacy of the heliocentric hypothesis in importance", writes Maddox. "In 1900, a few brave spirits may have hoped that an understanding of life would be won during the century just beginning, but there cannot have been many of them" (p. 20).

After this fascinating broad sweep, we are left with the three main parts of the book, "Matter, Life and Our World", each dealing with specific
fields. Part one is a rich account of the theories about the origins of the universe and of matters; part two deals with the sciences related to the origin of life and part three with the neuroscience and mathematics. The book concludes with a futuristic account, appropriately entitled, "What Lies Ahead".

Three chapters which make up the first part of the book ("Matter") narrate the gripping tale of the emergence of various theories about the origin of universe. How did the scientists arrive at theories like the Big Bang and Theory of Every Thing (TOE)? How were smaller and smaller particles discovered and what were the implications of these discoveries? What lies ahead for cosmologists? These and related topics form the core of this part but one thing is missing: Maddox makes no reference to the return of the scientists to the religious worldviews and many attempts which have been made and are being made to correlate the scientific data with the religious texts. He is not interested in a "religious cosmology", his subject is merely the "scientific cosmology" devoid of metaphysical considerations. He concludes this section with predictions:

By extension, the idea that the universe began in a single event, the big bang, will be found false. For most of the five centuries since Galileo first saw the moons of the Jupiter through a telescope, observers of the heavens have been like kidnap victims seeking to learn where they are from the chinks of light that reach them through imperfect blindfolds; half a century from now, cosmologists will have a much better idea of what kind of universe they are expected to explain. The once-and-for-all universe of Genesis, or of Guth's equivalent, is an improbable outcome (p. 122).

"Life", the second part of the book, is more directly concerned with the questions on the borderline of science and religion but does not deal with the issues which arise from this interface. Tracing the origin of modern biology, Maddox outlines the broad contours of our understanding of life, as it emerged through the work of Darwin, Louis Pasteur, Friedrich Wohler and A. I. Oparin. He narrates the interesting set of events which led to our understanding of the Organic and Inorganic matter and, step by step, constructs the grand picture of Human Genome Project.

This part is also where one comes to the humbling realization of the limitations of science. What we know is so little compared to what we do not. Genetics has produced a rich harvest of understanding during the last twenty years: We now know that Down's Syndrome is caused by the presence in the embryo of three rather than two copies of human chromosome 21 but what do we do with this knowledge? Use it to terminate pregnancy? Know in advance that the baby will be born with Down's Syndrome and be ready for the civilizational influence that comes with
caring for disadvantaged children? A whole range of ethical and even religious questions have been raised by these discoveries, though Maddox does not deal with them (for they are outside the scope of the present book).

Recent advances in genetics have raised more questions than they have solved: How are groups of related genes regulated in concert? What exactly are the influences that prevent the activity of some genes? Maddox ends chapter six of this part with an appropriate warning: "But there is an important lesson that molecular geneticists should learn: in a field that engenders great public sensitivity and triumphalism, the idea that everything is determined by genes is their Achilles' heel. Most people, including those whose health may be powerfully improved with the help of new genetic knowledge, know that there is more to life than genomes" (p. 234).

"Our World", the third part of the book, deals with three important subjects in as many chapters. "Thinking Machines", the first of the three chapters, is a wonderful account of the emergence of neuroscience as one of the key sciences of the twentieth century. The transition from focus on the nervous system to the brain has been slow but once the scientific community came to realize the lack of data about the functioning of "mind" — the imprecise label sometimes used to denote a combination of heart, brain and nervous system and sometimes other combinations (including the soul) — there has been steady progress in the field and neuroscience has gained tremendous prestige and respect. Maddox traces the relatively short history of major discoveries in this field and leads us to the connection neuroscience has made with the study of genes:

Fortunately, there is now a prospect that the understanding of all these processes will be illuminated not merely by further studies of the anatomy of the brain, but by the study of the genes that guide the development of the nervous system (p. 286).

This important connection has been made in a series of remarkable discoveries which produced the metaphor of mind as a computer. In 1954, Frank Rosenblatt, a US engineer, devised a machine called "The Perceptron", intended as a device for recognizing printed characters. It failed but the idea that networks of simple electronic elements can simulate some functions of the brain was not forgotten and twenty years later, John Hopfield of the California Institute of Technology published his persuasive account of how such a network could indeed be built so as to store "memories" of several different patterns of inputs and then tell to which of them an unknown stimulus most closely corresponds. This important suggestion is leading to cutting-edge technological innovation, including the speech recognition and NETtalk. But the crucial question remains...
unanswered: What is Consciousness? And how does it work? And this is the question for neuroscience of the twenty-first century.

But what really lies ahead for science? The book concludes with a map of things to come. Maddox briefly revisits his earlier chapters and leads us to the road that lies ahead for physics and life sciences. He concludes the book by saying that years ahead are full of exciting possibilities for the entire human race.

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