

人类文明与文化读本
Read into Human Civilization and Culture

UNIVERSE, ENVIRONMENT AND LIFE

顾陈
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主编

宇宙、环境 与生命

Book 1
Volume 2

外语教学与研究出版社
FOREIGN LANGUAGE TEACHING AND RESEARCH PRESS

Read into Human Civilization and Culture

人类文明与文化读本

Universe, Environment and Life 宇宙、环境与生命

Book 1
Volume 2

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General Introduction to

Read into Human Civilization and Culture

More than two thousand years ago, the Chinese ancient philosopher, Plato's contemporary, Lao Zi philosophizes thus:

道生一,一生二,二生三,三生万物 (Lao Zi, ch. 42)

In other words, it can be said that at the very beginning of everything, the universe was one. Then it followed its own way (i.e. its 道) by breaking itself into two, then two into three, and three multiplies itself, giving birth to everything as is found today. In the parlance of the modern theory of the universe, at the very beginning, according to the present-day leading physicist, Stephen Hawking, there existed a pea-like ball. Then occurred the Big Bang. With it came time and space. Then the Cambrian Big Bang fills our Mother Earth with beaming lives and everything else!

What does this quick tour to philosophy and cosmology mean to us, learners and teachers of English? "I can't see any relevance," a challenging voice may say. It is a legitimate challenge and deserves a detailed answer, hence this preface.

There is only one Mother Earth. Plants, animals, oceans, lands, rivers, mountains, and of course us human beings, are all co-inhabitants. We live together and have to survive together. However, it takes thousands of years for us, the so-called super beings in the animal kingdom, to comprehend this simple truism. We have not been friendly to our co-inhabitants. Rain forests are being deforested, rivers polluted, rare species of animals eaten or deprived of their traditional habitats, ozone layers holed, to name but a few. To make things worse, the human world has been divided and locked up in brutal wars. It starts to dawn on us now that disasters are largely man-made, and that they know no country boundaries. A local nuclear explosion means a devastating short-term or long-term hazard to everything on the globe. It is high time now for us to learn to understand our co-inhabitants, and to develop a harmonious rapport with them so as to achieve a collective survival. It is from this broad perspective that the *Read into Human Civilization and Culture* series are designed and compiled.

The objectives the series hope to obtain are:

- to enhance learners' understanding of human global environment;
- to enhance their understanding of organisms, plants and animals;
- to help them look at human society and culture in a critical and historical perspective;
- to enhance their appreciation of human artistic creativity and imagination;
- to enhance their analytic examination of human rationality and reasoning.

With these objectives, the series consist of four books, each of which is made up of two volumes. The second volumes mirror the first volumes both in structure and theme.

Book 1 (i.e. the present one)

Universe , Environment and Life

Book 2

Man , Civilization and Culture

- Part 1 Human evolution
- Part 2 World civilization
- Part 3 Knowledge as power
- Part 4 Scientists in profile
- Part 5 Man's insatiable desire
- Part 6 Issues and challenges

Book 3

Man's Imagination and Recreation

- Part 1 Arts — a historical survey
- Part 2 Religion and arts
- Part 3 Music and culture
- Part 4 Sculpture and city culture
- Part 5 Sports and culture
- Part 6 Modernity and modern arts

Book 4

Man's Self-Understanding and Beyond

- Part 1 Man as a philosopher
- Part 2 Man as a social animal
- Part 3 Man as a believer
- Part 4 Man as a tool-using animal
- Part 5 Man as a political animal
- Part 6 Man in an information age

It is the hallmark of an intellectual maturity for Chinese learners of English to achieve a good

level of understanding in these areas. It is believed that a high level of English proficiency is no longer a sheer matter of language issue. It demands intellectual maturity and sophistication.

Each book is self-contained and can be used separately. However, they are preferably used together. Learners are advised to begin with Book 1 and carry on all the way to Book 4. Although all the books can be used for self-study, they are also designed for classroom use. Each book consists of 6 parts; each part is made up of 3 units all centering around one common topic but from different perspectives. Each unit in turn is composed of a Text A and a Text B, sometimes a Text C as well. The Text As, which present the most essential reading, are put into Volume 1 of each book and are recommended to be used in classroom. All the Text Bs and Text Cs go to Volume 2 of each book and are expected to be read after class. Since volume 2 mirrors volume 1 in structure and theme, the reading outside class will reinforce and consolidate what is taught in class.

Enjoy your reading. Good luck!

Introduction to Book 1 —

Universe , Environment and Life

It is a summer night. I sit beside Granny, at the river side. I look up to the sky, and cannot help counting stars. I get lost before long. They are simply too many for me to count.

“Granny, how many stars are there in the sky?” I ask.

“Oh my boy, as many as you can imagine.”

“How big is the sky?”

“As big as you can imagine.”

All of a sudden, a star shoots across the sky leaving a long big tail behind. I grab Granny’s hand in fear.

Granny gives a deep sigh, murmuring to herself: “A soul’s gone to Heaven.”

This narrative perhaps strikes an echo in everyone’s childhood. The curiosity about the universe and the perennial desire to comprehend it are human curiosity and desire. Philosophers, scientists and ordinary people alike, all want to know how big the universe is, and how many stars there are in the sky.

Granny’s sigh betrays her ideology, namely that human life and existence are determined and controlled by the mysterious force of the universe, or God. It may be labelled as superstition or religious belief. However, present-day science tells us that Granny’s sigh should not be dismissed so easily. There is a lot to be learned from it. Humans have been too arrogant in the animal kingdom, and too hostile to environment. Now they come to realize, perhaps not too late, that they have to pay a heavy price for what they have done to other animals and to forests, rivers, natural energies, to name but a few. It is high time that we should seek to understand the universe, the Earth, the Continents, rivers, mountains, lakes, oceans, and of course life — all forms of life, life in the air, under the sea and on the land. This is what Book 1 is about.

As you may know now, Book 1 has two volumes. Volume 1 is intended to be used in class, and Volume 2 is advised for post-class reading. All the texts included in both volumes are kept original except that sub-titles may be found added to help you comprehend the contents. Substantial notes are carefully made about the culturally loaded items.

There are introductions to the six parts, and introductions/summaries to all the texts. They are designed in such a way that they activate what learners have already known and create an expectation of what they hope to know through reading. So it is strongly recommended that learners and teachers read the introductions and summaries first before plunging into the texts.

A final note. Since the texts are organized thematically in terms of knowledge network, learners are led to a wide range of topics and issues. This is, we believe, one of the merits of the book. However, the price for it is the scope of vocabulary that goes beyond the normal range of the first year English major students. The problem is not that serious as we first thought. The unknown words you are going to encounter in this series go to your reading vocabulary, not your listening or speaking or writing vocabulary. As your reading vocabulary, all you are expected to know about the unknown words is your ability of recognizing their meanings in the context. This is actually no demanding task at all. Your reading experience, we bet, will bear this point out!

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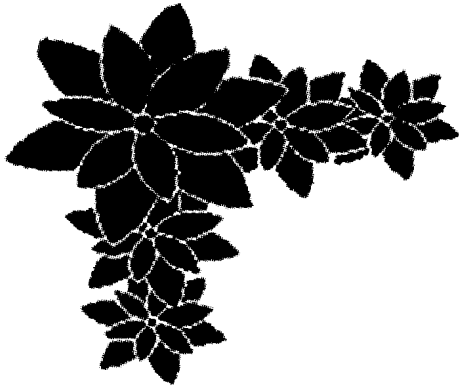
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Part 1

The Big Bang and Afterwards

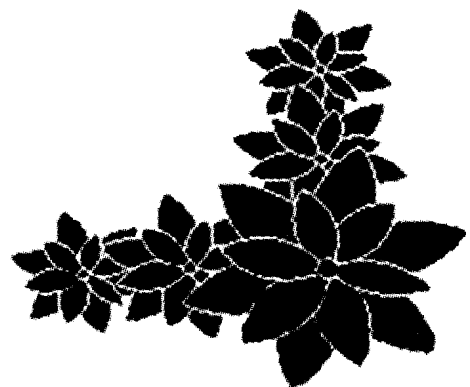
- Unit 1 The Big Bang and the Universe
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Unit 1

The Big Bang and the Universe

- Text A The Mother Earth's Place in the Universe
- Text B Challenging the Big Bang: the Beginning of Everything



Unit 1

Text B

Challenging the Big Bang: the Beginning of Everything

Introduction

If you liked reading text A, you will like this text B --- even though you will certainly find it quite difficult. Here you can get a glimpse of some of the most fantastic theories put forward by physicists and astronomers to try to account for the beginning of everything.

Of course what you will get is no more than a glimpse, because these ideas can only be fully expressed in mathematical formulae. Yet the incomplete account in everyday English this text offers is exciting in itself and can certainly answer some of the questions you have in your mind about the universe we find ourselves in.

The text is an informal speech given by Professor Neil Turok of Cambridge University. In it Professor Turok not only explained a new theory about the origin of the universe put forward by Stephen Hawking and himself, he also talked about his experience of working with Stephen Hawking, the very famous disabled physicist.

While reading the text, please bear this point in mind: The very distant parts of the universe, which can now be studied, are so far away that their light takes an immensely long time to reach us. So at the same time as scientists study the depths of space, they are also studying the remotest depths of time.

The Beginning of Everything

1. Teamwork in theoretical physics
2. Working with someone who is a mathematical genius and severely disabled
3. Background to a new discovery
4. The standard theory of the "big bang"
5. What the Big Bang theory fails to explain

6. New ideas from particle physics
7. What the theory of an inflationary universe fails to explain
8. The theory of an “open” universe
9. Correcting a mistake — and finding a new solution
10. What is meant by an instanton
11. Is this the end of the story?

Stephen Hawking, author of the best-selling A Brief History of Time, has a new theory: it says the universe began as an ‘instanton’, an exploding cocktail of space, time matter and gravity. His collaborator Professor Neil Turok tries to explain it in an interview.



Stephen Hawking

1. Teamwork in theoretical physics

Recently my colleague Stephen Hawking and I have made what we consider to be a very exciting discovery regarding the possible beginning of our universe. We think this discovery takes us one step closer towards a “theory of everything”.

Our discovery is based on the work of a number of scientists over the past two decades, including my co-workers Martin Bucher and Alfred Goldhaber of Stony Brook and Stephen’s co-worker James Hartle at Santa Barbara. Theoretical physics

today is an international, frequently collaborative activity, in which major developments are often the culmination of the work of many scientists working in parallel. It's just a case of "many heads are better than one".

2. Working with someone who is a mathematical genius and severely disabled

I'm often asked what it's like to work with Stephen. As most people know, he's a brilliant scientist as well as a best-selling author — his book *A Brief History of Time* has sold millions of copies. But he also suffers from motor neurone disease, which has left him largely paralysed. He can talk only by using a hand-held mouse, selecting words or mathematical symbols one by one on his computer screen in order to compose a sentence. This makes communication slower than normal, but his answers are concise and well thought out — perhaps the time delay just gives him more time to think than the rest of us...

He manages to convey a lot with his eyes and facial expression — often words aren't needed. He is extraordinarily patient given the hassles of his everyday life; he is a warm person and has a great sense of humour. Jokes are frequent, and working with him is a lot of fun. It's also a great privilege, since his insight into the complexities of general relativity is second to none.

3. Background to a new discovery

I'm going to try to explain some of the background to our discovery, and why we are excited to be able at last to describe some aspects of the very beginning of the universe in a quantitative and precise manner. You should realise several things before I start. First, the discovery is essentially mathematical, and is formulated in the language of the theory of general relativity, invented by Albert Einstein to describe gravity, the force which shapes the large scale structure of the universe. It is hard to describe such things in everyday terms without being misleading in some respects — the origin of our universe was certainly not an everyday event.

The second important warning I have to give is that the theories we have built of a very early universe before the Big Bang are not yet backed up by experiment. We often talk as if they are real because we take them very seriously, but we certainly have no special oracular insight to the truth. What we are doing is constructing hypotheses which conform to the very rigorous standards of theoretical physics. But we are under no illusions that, until our theories are thoroughly supported by detailed experimental and observational results they will