



科技英语通俗读物

# 地球的过去和现在

[英] James Fisher 著

涂云深注释

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ADVENTURE OF THE WORLD

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商 务 印 书 馆

1978 年·北京

James Fisher

ADVENTURE OF THE WORLD

Rathbone Books, Adprint House, London, 1954

内 容 提 要

本书共分三部分:第一部分简述宇宙各个星体的概况,重点放在人类居住所在的地球的形成;第二部分讲日照、降雨、风吹、植物生长等自然界现象;第三部分着重讲述地球上山、川、湖泊、海洋、气候等对生物的关系,等等。

本书文字通俗,对于较难的词语,均加汉语注释,尽可能使读者的疑难得到解决。对原书的某些部分还作了一些删略。

本书适于高中三年级以上学生和读过英语三、四年的一般读者作为阅读科技英语的辅助读物。

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地球的过去和现在

[英] 詹姆士·费希尔著 涂云深注释

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商务印书馆出版

(北京王府井大街 36 号)

新华书店北京发行所发行

中国建筑工业出版社印刷厂印刷

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787×1092 毫米 1/32 1 1/8 印张 32 千字

1965 年 11 月第 1 版 1978 年 6 月北京第 2 次印刷

统一书号: 9017·602 定价: 0.14 元

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## I. HOW THE WORLD BEGAN

We who live on earth<sup>1</sup> have been thinking about<sup>2</sup> the Universe,<sup>3</sup> and its stars and planets,<sup>4</sup> for only a few thousand years; and making observations with elaborate scientific equipment<sup>5</sup> for a few hundred.<sup>6</sup> So we know very little about it, except that there are great mysteries yet to be explored and explained.<sup>7</sup>

Where, or what, did our sun and its system come from? How did nine planets come to travel round<sup>8</sup> the sun in orbits arranged in a plane or disc?<sup>9</sup> How did Life arise on at least one planet, Earth, and probably another, Mars?<sup>10</sup>

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1. on earth (= in the world): 世界上. on earth 系对 sky 而言. 如: the first *on earth* (世界第一), 在口語中強調最高級. 如: Marx was the greatest man *on earth*. (馬克思是最伟大的人物.) 在 what, where, why, how 之后, 強調問語, 表示“究竟”、“到底”之意. 如: What *on earth* do you mean? (你到底是什么意思?) 2. think(ing) about: 考虑; 思量; 思忖. 3. the Universe ['ju:nivə:s]: 宇宙. 4. planets ['plænits]: 行星. 5. making observations with elaborate scientific equipment: 以精致的科学装备作观察. making 和 thinking 并列, 它前面略去了 have been. 6. for a few hundred: 有几百年. hundred = hundred years. 7. mysteries yet to be explored and explained: 仍旧有待探索和解释的奥妙. yet 作“仍旧”解. “to be + 过去分词 (past participle)”有“有待”或“行将”之意. 如: To be continued (待续). 8. How did nine planets come to travel round...? 九个行星怎样绕...而运行? “come + 不定式 (infinitive)”有“显出能...”, “居然...起来”之意. 不定式表示謂語的主要意思, come 反而起表示語气等等的辅助作用. 9. in orbits arranged in a plane or disc: 在排列成一个平面的或圆盘形的軌道上. 10. Mars [mɑ:z]: 火星.

## *The World in the Making*<sup>1</sup>

Nobody knows for certain<sup>2</sup> how the solar system<sup>3</sup> began — how the sun came to have nine planets, with their moons and rings,<sup>4</sup> and thousands of tiny planetoids.<sup>5</sup> Some scientists think that about 2,500 million years ago the sun and a greater star revolved round<sup>6</sup> each other. Astronomers<sup>7</sup> know many such ‘double stars’<sup>8</sup> in the Universe. Suddenly the greater star exploded;<sup>9</sup> most of its material rushed to<sup>10</sup> another part of the galaxy<sup>11</sup> of stars to which our sun belongs: but it left behind a disc of gas<sup>12</sup> and other matter which remained attracted by, and revolving round, the sun. This stuff soon gathered into four or five masses.<sup>13</sup>

According to<sup>14</sup> this theory, the big masses later split into<sup>15</sup> unequal parts, of which the largest became the giant planets Jupiter,<sup>16</sup> Saturn, Uranus, and Neptune. The smallest, Uranus, is 30 thousand miles across;<sup>17</sup> the largest, Jupiter, 90 thousand.<sup>18</sup> The five other chief planets

---

1. in the making: 在形成中. 2. for certain: 肯定地; 确凿地. 用作状语, 修饰 knows (知道). 3. the solar system: 太阳系 (the sun and the planets that move round it). 4. rings: 环. 5. planetoids [ˈplænitɔɪdz]: 小行星. 6. revolved round: 绕...旋转. 7. astronomers: 天文学家. 8. double stars: 双星. 9. exploded: 爆炸. 10. rushed to: 冲向. 11. the galaxy [ˈgæləksi]: 银河系 (the Milky Way). 12. a disc of gas: 气团. 13. masses: 团; 堆. 14. according to: 依照, 是一短语介词. 15. split into: 分裂成. split 是过去式. 16. Jupiter [ˈdʒu:pɪtə]: 木星. 这个词和其后的 Saturn [ˈsætən] (土星), Uranus [ˈju:(ə)rənəs] (天王星) 以及 Neptune [ˈneptju:n] (海王星), 都是 planets 的同位语. 17. The smallest, Uranus, is 30 thousand miles across: 最小的(行星), 天王星, 直径有三万英里. 副词 across (从这边到那边) 在这里用作表语, 它的前面常同表示度量的词 (miles 等) 连用, 意思是“两端距离为...”或“直径为...”. 18. the largest, Jupiter, 90 thousand: 最大的行星, 木星, 直径有九万英里. 全句 = the largest Jupiter (is) 90 thousand (miles across). 因“90”前有逗号, 故省去 is. 凡有逗号时, 略去相同的谓语.

are Mercury,<sup>1</sup> Venus, Earth, Mars and Pluto, and these are all between three and eight thousand miles across. Earth, the largest of these, has a diameter of 7,900 miles. Most of the planetoids may be the remains of a broken-up<sup>2</sup> planet between Mars and Jupiter; the largest of them is Ceres,<sup>3</sup> 480 miles across.

Moons orbit<sup>4</sup> round planets, not the sun. We do not know whether Pluto has any, and we know Mercury and Venus have not: all the other planets have at least one moon. Both Jupiter and Saturn have moons bigger than the planet Mercury. Neptune has one about as big. Jupiter has, besides, two moons about the size of Earth's single moon, which is 2,160 miles across. As well as nine moons, Saturn has rings, which may be ice particles. The smaller of Mars' two tiny moons is only five miles across.

All together, the planets total no more than a seven-hundredth<sup>5</sup> of the mass of the sun and now shine only in its reflected light.<sup>6</sup> Several of them, and several moons, have atmospheres of gas — water-vapour, carbon dioxide, air, methane or ammonia;<sup>7</sup> but the only ones<sup>8</sup>

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1. Mercury ['mæ:kjuri]: 水星. 同其后的 Venus ['vi:nəs] (金星), Pluto ['plu:tou] (冥王星) 等都用作表語. 2. the remains of a broken-up...: 破碎(瓦解)的...残余. 3. Ceres ['siəri:z]: 谷神星. 4. orbit *v.i.*: 环绕...的周围运行. 示例: In 25 hours the spaceman *orbited* the earth 17 1/2 times and covered nearly 435,000 miles. (这位宇宙飛行員在 25 小时內环绕地球 17.5 周, 航程将近 435,000 哩.) 5. total no more than a seven-hundredth: 总计不过百分之七. total 是動詞, 常用数詞或可数名詞为宾語. 6. reflected light: 反射的光綫. reflected 是过去分詞, 修飾 light. 7. atmospheres of gas — water-vapour, carbon dioxide, air, methane or ammonia: 水汽, 二氧化碳, 空气, 沼气或阿摩尼亚的气层. 8. ones = planets.

that can support life as we know it are Earth, probably Mars and possibly Venus. On one side of the Mercury the temperature would melt lead<sup>1</sup> and is too hot for life; on the other, which never sees the sun, it is too cold. On the rest of the planets the temperature is too low and any atmosphere may be poisonous. In proportion to<sup>2</sup> its size, Earth is the heaviest of the planets; it contains huge amounts of iron. So far,<sup>3</sup> man has penetrated only a few miles into its crust,<sup>4</sup> and knows very little about its inside. Scientists disagree about the size of the earth's innermost core; whether it is liquid rock<sup>5</sup> or iron and whether it is hot or cool. But most of them think that the earth has had much the same sort of crust and temperature for at least 1,000 million years. During this time it has shrunk a little, which has caused the crust to buckle and fold, forming mountains.<sup>6</sup>

Compared with the life-span of a living thing,<sup>7</sup> the span of geological time is vast. The longest-lived plants seem to die when they are about 4,000 years old, and no animal lives longer than about a hundred and fifty years. Yet it is perhaps 1,000 million years since life began on Earth, probably in the shallow edge of a warm sea. It could not have begun without water, air and the

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1. lead [led]: 鉛 (n.). 和動詞 lead [li:d] (引, 領導) 有別. 2. in proportion to: 按...比例來說. 3. so far: 到目前為止; 截至目前. 4. crust: 地殼. 5. liquid rock: 液岩. 6. which has caused the crust to buckle and fold, forming mountains: 這一來就使地殼發生曲疊, 形成山岳. 關係代詞 which 指代整個句子所述的内容. to buckle 和 fold 是不定式用作補足語; forming... 表示此二詞的伴隨情況. 7. Compared with the life-span of a living thing: 與生物的壽命相比. compare with “把...跟...比較”.



element carbon.<sup>1</sup>

Living things can make complicated substances out of simple ones; they grow and reproduce themselves in a way that<sup>2</sup> lifeless matter cannot do. No two succeeding generations of any kind of living thing are ever exactly the same. We call this change, which goes on from generation to generation, evolution.<sup>3</sup> What evolution has done lies all around us. Several million different sorts of animals and plants now share the world with man;<sup>4</sup> all are probably descended from<sup>5</sup> the first simple living substance of earth. Before we see how living things inherited the earth, we must understand something about the rocks of the earth's crust. There are two main kinds, igneous and sedimentary.<sup>6</sup>

Igneous rocks (meaning rocks associated with fire) come from hot parts of the earth's crust, or possibly from below it. They penetrate, as liquids, along lines of weakness in the crust and may appear at the surface or form masses of rock under it.

Sedimentary rocks (rocks which are laid down) are formed as the result of erosion<sup>7</sup> — eating away. Existing surface rocks, sedimentary or igneous, are constantly subjected to erosion by<sup>8</sup> wind, frost, ice, water, or sand.

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1. It could not have begun without water, air and the element carbon: 如果沒有水、空气和碳元素, 生命就不会开始。这句等于: It could not have begun if there had been no water, air and the element carbon. 介詞 without 作“假若沒有”解。 2. that = in which. 3. evolution: 进化。 4. share the world with man: 和人类同居于世界; 和人类共同占有这个世界。 5. are descended from: 从...演化而来; 来自。 6. igneous and sedimentary (rocks): 火成岩和沉积岩。 7. erosion: 侵蚀; 剥蚀。 8. are subjected [səb'dʒektɪd] to erosion by...: 遭受(...的)侵蚀。

The material worn away<sup>1</sup> becomes mud or sand. This finds its level<sup>2</sup> and settles in horizontal, or nearly horizontal beds, at the bottom of seas, lakes and basins: or it blows across the land into dunes and banks.<sup>3</sup>

We can date the strata by the remains of living things in them.<sup>4</sup> The fossil<sup>5</sup> record tells us nearly all we know about life in the past. But it did not begin until about 500 million years ago,<sup>6</sup> when living things had hard parts — their skeletons<sup>7</sup> — to leave behind after death.

### *First Age of Life*<sup>8</sup>

What the first living things were like we can only guess: they were certainly single-celled.<sup>9</sup> What we can call the First Age of Life, lasting<sup>10</sup> for over 250 million years, began about 500 million years ago with living things that left fossils. The first period of this age was a time of molluscs,<sup>11</sup> although there were other quite complicated animals like graptolites<sup>12</sup> and some jointed, hard-shelled trilobites.<sup>13</sup> In the periods which followed, life

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1. The material worn away: 消失的物质. worn 是 wear 的过去分词, 組成短語, 修飾 material. 2. finds its level: 达到相当的地方 (reaches right place with regard to others). 3. dunes and banks: 沙丘和堤岸. 4. date the strata by the remains of living things in them: 通过地层中生物的遺骸来断定地层的年代. 5. fossil: 化石 (the hardened remains of an animal or plant from prehistoric times, found in earth). 6. But it did not begin until about 500 million years ago: 但是它約在五亿年前才开始. not ... until 作“直到...时才”解. 如: I did not get up until eight in the morning (我到早晨八点才起床). 7. skeletons: 骨骼. 8. (the) First Age of Life: 元古代. 9. single-celled: 单細胞的. 10. lasting: 繼續; 經歷. last 的現在分詞, 用作定語. 11. molluscs ['mɒləskz]: 軟體动物. 12. graptolites ['græptəlaɪts]: 笔石(古生物). 13. some jointed, hard-shelled trilobites: 有关节的, 硬壳三叶虫.

still existed only in the sea. For a hundred million years life was dominated by seaweeds,<sup>1</sup> jointed animals and molluscs.

During the first period of the First Age there was little movement of the earth's crust. But the period which followed — a time of fish — was one of sudden and violent movement. When it began, about 300 million years ago, the earth underwent a succession of upheavals,<sup>2</sup> forming great 'crinkles' in the crust.<sup>3</sup> Layers of rock<sup>4</sup> which had previously been under water, were lifted up and folded; often land areas sank, and the sea covered them.

The folding of the crust which forms mountains is sometimes very complicated; at other times it is simple, and the land resembles a wrinkled table-cloth. As the forces increase, the folds are squeezed together and may finally tumble over. Although today the surface of the land seems changed beyond all recognition,<sup>5</sup> we can still see evidence of<sup>6</sup> this time of mountain-building — in Scotland and Norway, Brazil and south of the St. Lawrence River in North America.

While these movements were going on, life colonized the land for the first time.<sup>7</sup> The first invaders from the sea were plants; they were followed by some simple, jointed animals. In the sea, evolution continued with

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1. seaweeds: 海藻. 2. succession of upheavals: 連續起伏. 3. forming great 'crinkles' in the crust: 形成地壳的巨皱. 4. layers of rock: 岩层. 5. changed beyond all recognition: 变化得无从识别. changed 在系詞 seems 之后, 作主語的补足語 (即表語). 6. see evidence of: 見到有...迹象. 7. life colonized the land for the first time: 生命有史以来初次在地上落居.

the rise of some fish-like creatures called ostracoderms<sup>1</sup> and some true fish. Many of these early fish-animals were curiously armoured.<sup>2</sup> Some of the nautiloids<sup>3</sup> became coiled. The first backboneed animal<sup>4</sup> to go ashore is a lung-fish. He is the ancestor of amphibians, reptiles, birds and mammals.<sup>5</sup>

Towards<sup>6</sup> the end of the First Age of Life came a great period of coal-forming — Carboniferous,<sup>7</sup> which lasted for over 50 million years. This was a period when life, while continuing<sup>8</sup> to colonize the land, spread also into the air in the form of winged insects.<sup>9</sup> It was a time, too, of a definite rhythm of upward and downward movement of the earth's crust. The great forests of early tree-like plants were often drowned and buried by sediments and in time their remains became coal. The chief coal-makers were very tall plants with spreading roots. Huge reeds and fern-like plants grew in the swamps near the mouths of rivers and made coal, too. Coal was also formed in several other periods, but mostly in the Carboniferous.

In the marshy forest of this period we find early amphibians. The wide-headed creature is a stegocephalian<sup>10</sup>

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1. ostracoderms: 甲冑魚. 2. armoured: 装甲的; 带硬壳的. 3. nautiloids: 鸚鵡螺属軟体动物. 4. the first backboneed animal: 第一个有脊(椎)骨的动物. 5. the ancestor of amphibians, reptiles, birds and mammals: 两栖动物、爬虫、鸟和哺乳动物的祖先. 6. towards: 将近(...的时候). 7. a great period of coal-forming — Carboniferous: 形成煤的时代——石炭紀. 8. while continuing = while (life was) continuing. 9. winged insects: 带翅昆虫. winged 是过去分詞, 修飾 insects. 10. The wide-headed creature is a stegocephalian ['stegə'se'fæliən]: 寬头的是堅头类动物. 形容詞+名詞+ed 这种組合形式多用于描写人或物的特点及品性, 如: short-sighted man (近视眼者), high-heeled shoes (高跟鞋), narrow-minded fellow (气量狹小的人), one-armed man (单臂人), white-haired girl (白毛女), eight-legged essay (八股文).

and the crocodile-like animal a giant salamander.<sup>1</sup> Note the flowerless trees and the big dragonfly,<sup>2</sup> one of the earliest insects. There were no birds or reptiles.

### *Second Age of Life*

The First Age of Life ended a little over 200 million years ago; with great changes in the earth's surface. The marshes dried up. New and more advanced kinds of plants established themselves on dry land,<sup>3</sup> and some of the new forms of animal life were vastly different from those which were dying out.<sup>4</sup> They inhabited the sea, the land and the air, and made a bridge, or link, between the ancient forms of the First Age of Life and those we see today. These new creatures evolved from the amphibians, but unlike the amphibians, did not need water for the growth of their young. They were the first reptiles. By the end of<sup>5</sup> the First Age, there were many different sorts of reptiles; but during the Second Age of Life a special group of reptiles, the dinosaurs,<sup>6</sup> came to dominate the earth's surface in a dramatic way. In the

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1. and the crocodile-like animal a giant salamander [*ˈsæləməndə*]: 像鱷魚的動物是一條巨火蛇 (= and the crocodile-like animal is a giant salamander). 2. dragonfly: 蜻蜓. 3. new and more advanced kinds of plants established themselves on dry land: 新而更高級的植物在乾燥的陸地上落居. to establish oneself 作“落居”解. 如: He established himself in the country (他在鄉村安家落戶). 4. were dying out: 正在逐漸絕迹 (消失). die out 作“消亡”解. 如: The clip-clop of the coach horse died out on the highway and made way for the rattle of steam locomotive carrying freight and passengers along the new railroads. (公路上四輪馬車的馬蹄的嗒嗒之聲消聲匿迹了, 代之而起的是行駛在鐵路上載運貨物和乘客的蒸汽機車的隆隆之聲了.) 5. by the end of...: 在...之前; 最遲在...; 截至...為止. 6. dinosaur [*ˈdaɪnəsɔː*]: 恐龍.

early period of the Second Age of Life there were great deposits of sediment.<sup>1</sup> On land there were desert-like conditions and the seas were alternately shallow and deep.<sup>2</sup> What rains there were, washed the crumbled rock into the sea,<sup>3</sup> forming great layers of sand. At the same time the sea was full of single-celled animals with hard, but chalky shells. When they died, their shells fell to the bottom and formed thick layers. This became compressed to make chalky rock,<sup>4</sup> which in places is very thick. Earth movements, long after, have raised the chalk above the sea. Besides the chalk, which came from sea-animals, huge deposits of sediments were formed in the Second Age of Life as a result of erosion. Fine mud, washed down from the hills, settled far out in seas and lakes to form clay and sands. When animals of the Second Age died, they often did so on these sediments, or were washed into them. Quickly they were overlaid<sup>5</sup> by more sediments; their bones were thus preserved as fossils. The sedimentary rocks of this Age of Life are thousands of feet thick and rich in fossils. Thus we have learned quite a lot about the animals of this age and their evolution.

### *Third Age of Life*

During the 100 million years of the Second Age there evolved<sup>6</sup> a group of warm-blooded animals, small at

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1. deposits of sediment: 沉淀物; 沉积物. 2. alternately shallow and deep: 深浅交替. 3. washed the crumbled rock into the sea: 把破碎岩石冲入海里. 4. compressed to make chalky rock: 压缩成白垩岩. 5. overlaid: 涂盖. 是 overlay 的过去时和过去分词. 6. evolved: 发展; 进化. 这个动词谓语前面有引导词 there, 主语和谓语的顺序颠倒.

first, which were to inherit the earth when the great reptiles became extinct. For 75 million years, since the beginning of the Third Age, these animals, the mammals, have dominated the earth. They have reached, in the sea, the greatest size ever reached by animals. On land none was ever as big as the biggest dinosaur, but baluchitheres and mammoths<sup>1</sup> weighed many tons.

### *Fourth Age of Life*

About a million years ago the Third Age of Life ended with a climate-change,<sup>2</sup> known as the Ice Age (or Ages). The polar ice moved so far south that it more than once covered parts of Europe, Asia and North America that are now densely inhabited by humans. Four times the ice came down; four times it retreated; each time it left behind great deposits of muck and rubble<sup>3</sup> which covered the ground and dammed back<sup>4</sup> vast lakes of water. Needless to say,<sup>5</sup> this million years was a great testing-time for animals, and only the most adaptable of them survived outside what are now the tropical belts,<sup>6</sup> which were then still warm.

During the Ice Ages, man developed the use of tools, mainly made from flints, and thus a way of protecting himself against hazards;<sup>7</sup> this led him to<sup>8</sup> a new kind of life. At the end of the last Ice Age, fifteen

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1. baluchitheres and mammoths: 俾路支兽和猛犸象. 2. ended with a climate-change: 因气候变化而告终. 3. muck and rubble: 废物和块石. 4. dammed back: 围住; 控制. 5. Needless to say: 不用说. 6. only the most adaptable of them survived outside what are now the tropical belts: 动物中最能适应气候的才能在现在的热带以外生活. 7. hazards [ˈhæzədz]: 危险. 8. led ... to: 把...引向.

thousand years ago, we find him an intelligent hunter and an artist as good as any since.<sup>1</sup>

### *Man's Age of Life*

We call our own species of man *Homo sapiens*,<sup>2</sup> which means knowing man; and certainly we are the most intelligent of animals. Many things distinguish man from<sup>3</sup> those living animals most similar to him — his upright position; his higher brain capacity and complexity, which has enabled him to store knowledge and hand it down from generation to generation; his use of tools; his inability to defend himself except with weapons, etc.

The Fourth Age of Life, which belongs to man, is an age of a new kind of progress — human invention. Things that seem simple to us were once revolutionary discoveries; boats, rope, pottery, the wheel, the arch, the axe, the lever, the saw, the loom, were invented,<sup>4</sup> some more than once,<sup>5</sup> in different parts of the world.

What do we mean by civilization? How has man come to lead his present life, so complicated that he finds himself difficult to understand and even more difficult to manage? Man's advance was step by step; from

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1. an artist as good as any since: 最优秀的艺术家. as ... as any 作“最优秀的...”解. 2. *Homo sapiens* ['houmou 'seipienz]: 人类 (拉丁語). 3. distinguish ... from ...: 使...区别于...; 把...同...区别开来. 4. boats, rope, pottery, the wheel, the arch, the axe, the lever, the saw, the loom, were invented: 发明了舟、繩、陶器、輪、拱門、斧、杠杆、鋸和織布機. 5. some more than once = some were invented more than once.



a hunting life with fire, tools and the gathering of wild plants by families, to tribes and village groups who cultivated food in the summer to store for the winter; from little towns with trade and barter and the division of work to big towns with systems of government and special religions. Man did not reach the same state of learning all over the world at the same time. The greatest source of ideas, methods and inventions, from which we of the west trace our own, were the civilizations of Mesopotamia<sup>1</sup> (Babylonia) and Egypt; then those of Greece and Rome. These gave us what is still the most powerful tool of man, the written record, with alphabet and numerals.<sup>2</sup>

We have now brought our story from the dawn of life to the time of history. But before we can see how man is using his inheritance today, we must look more closely at the earth itself. We must see how it works, what it is made of, what grows on it, what wonders and what challenges it presents.

### *The Ages of Life*

Here we sum up<sup>3</sup> the rise of life. At first animals were made of single cells; then of groups of cells; then of different kinds of cells. Next came nervous system;<sup>4</sup>

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1. Mesopotamia [ˌmesəpəˈteɪmjə]: 美索不达米亚 (在底格里斯河和幼发拉底河两河流域的地区). 2. what is still the most powerful tool of man, the written record, with alphabet and numerals: 至今仍然是人类最有力的工具——有語言符号和計算數目的文字紀錄. what ... man 为賓語从句, the written record 为同位語. 3. sum up: 總結; 概括. 4. nervous system: 神經系統.