

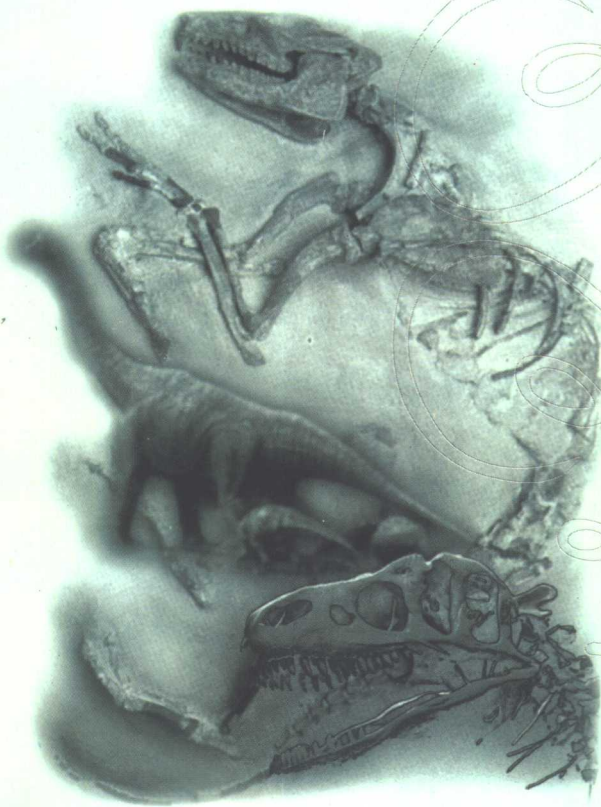
物种起源(节选)

The Origin of Species

查理·达尔文 著

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英汉对照世界著名科学家代表作选读

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萧咏梅 秦德年 译

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序

科学技术的发展不是一蹴而就的，它是人类经验的长期累积和修正的结果，是人类理性思维的不断探索和提高。或者说，任何新科学、新技术都是踩在前人的肩膀上向新高峰的攀登。因此，我们在关注当前新科学、新技术的发展动向的同时，了解世界上伟大思想家、科学家和经济学家们的学术思想和成就甚为必要。我们还要了解这些先哲的治学方法和人格情操，如伽利略对亚里士多德权威理论的挑战，达尔文对唯心主义神造论的否定，爱因斯坦除相对论外，对社会和政治问题所表现出的极大兴趣。

对广大中国读者来说，要找到不同时期著名科学家和经济学家经典著作的中文译本有一定困难，有些译文在内容译述和文体表达方式上有待完善，这便呼唤学术界和出版社翻译和出版这方面的高质量的经典著作。如今，由河北经贸大学副校长陈叔敏先生领衔主编《英汉对照世界著名科学家代表作选读》和《英汉对照世界著名经济学家代表作选读》两套系列丛书，并由河北科学技术出版社出版，正是为了满足现代读者的需要。这两套丛书将陆续翻译有关牛顿、伽利略、爱因斯坦、巴甫洛夫、亚当·斯密、马歇尔、凯恩斯、萨缪尔森等名家的代表作。因此，这是一项具有战略意义的

出版工程，是令人无比激动的喜讯。

参加翻译的有该校和兄弟院校的资深英语教授和有关专业的专家，以确保译文的忠实性和可读性。我读了部分译稿后，感到译文达意，表述流畅，爱不释手，时有与先哲们对话之感。愿与读者们共享个中乐趣。

胡壮麟

北京大学/清华大学教授

2000年11月16日

译者前言

查理·达尔文 (Charles Robert Darwin, 1829 - 1882), 英国博物学家, 进化论的奠基人。他曾以博物学家身份乘船作历时 5 年 (1831 - 1836) 的环球航行。其间在动、植物和地质等方面进行了大量的观察和采集, 经过综合探讨, 形成了生物进化的概念。于 1859 年出版震动当时学术界的《物种起源》一书, 提出了“物竞天择, 适者生存”, 以自然选择为基础的进化学说。该书不仅说明了物种是可变的, 而且对生物适应性也做了正确的解说, 从而摧毁了各种唯心的神造论、目的论和物种不变论, 并给宗教以沉重打击。恩格斯认为达尔文的进化论是 19 世纪自然科学三大发现 (能量守恒和转换定律、细胞学说和进化论) 之一。

本书选自《物种起源》第四章。该章是进化学说的主体部分, 详细论述了有关自然选择的各个方面。达尔文进化论最精辟的表述“物竞天择, 适者生存”即出自此处。

阅读此文, 读者可从字里行间时刻感受到这位科学巨子对科学的挚爱及其严谨、无畏、谦逊的科学精神。此外作为优秀科技论文, 它除了帮助读者开阔眼界, 增加知识以外, 由于所选英语原版文章语言凝炼, 因此对提高读者的科技英语阅读和翻译能力将大有裨益。

CHAPTER IV

NATURAL SELECTION; OR THE SURVIVAL OF THE FITTEST

Natural selection—its power compared with man's selection—its power on characters of trifling importance—its power at all ages and on both sexes—Sexual selection—On the *generality* of intercrosses between individuals of the same species—Circumstances favourable and unfavourable to the results of Natural Selection, namely, intercrossing, isolation, number of individuals—Slow action—Extinction caused by Natural Selection—Divergence^① of Character, related to the diversity of inhabitants of any small area, and to naturalisation^②—Action of Natural Selection, through divergence of Character and Extinction, on the descendants from a common parent—Explains the grouping of all organic beings^③—Advance in organisation—Low forms preserved—Convergence of Character—Indefinite multiplication of species—Summary.

Natural Selection

How will the struggle for existence, briefly discussed in the last chapter, act in regard to variation?^④ Can the principle of selection, which we have seen is so potent in the hands of man, apply under nature? I think we shall see that it can act most efficiently. Let the endless number of slight variations and individual differences occurring in our domestic productions, and in a lesser degree in those under nature, be borne in mind,^⑤ as will as the strength of the hereditary tendency. Under domestication,^⑥ it may be truly said that the whole organisation

自然选择或适者生存

自然选择——其作用与人工选择的比较——它对次要性状的作用——对不同年龄和不同性别的作用——性别的选择——关于同一物种个体间杂交的概述——影响自然选择结果的有利环境与不利环境，即杂交、隔离、个体数目——缓慢作用——自然选择导致灭绝——性状变异与任一狭小地区生物变异的关联以及与归化的关联——通过性状的变异和灭绝，自然选择对来自一个共同祖先的后代产生的作用——阐述所有有机体的分类——生物机构的进化——低级生物的保留——性状的趋同——物种的无限繁殖——摘要

自然选择

上一章简要介绍的生存竞争将如何对变异发生作用呢？蕴藏在人类手中的自然选择的原理，在自然界中能否适用呢？我认为我们将看到这一原理会极其有效地发生作用的。我们应该清楚这些无数的微小变异和个体差异，在人工繁殖与自然界的动植物中都有发生，只不过后者不太明显而已。同时还要清楚遗传倾向的作用。在家养状态下，确切地说整个结构在某种程

① divergence *n.* 变化，演变，[生] 趋异，变异。

② naturalisation *n.* (动、植物的) 顺化，归化。

③ organic beings 有机体。

④ variation *n.* 变异，变种。

⑤ 祈使句型：Let sth. be borne in mind: 我们应该清楚。

⑥ domestication *n.* 家养状态。

becomes in some degree plastic. But the variability, which we almost universally meet with in our domestic productions, is not directly produced, as Hooker and Asa Gray have well remarked, by man; he can neither originate varieties, nor prevent their occurrence; he can only preserve and accumulate such as do occur. Unintentionally he exposes organic beings to new and changing conditions of life, and variability ensues; but similar changes of conditions might and do occur under nature. Let it also be borne in mind how infinitely complex and closefitting are the mutual relations of all organic beings to each other and to their physical conditions of life; and consequently what infinitely varied diversities of structure might be of use to each being under changing conditions of life. Can it, then, be thought improbable, seeing that variations useful to man have undoubtedly occurred, that other variations useful in some way to each being in the great and complex battle of life, should occur in the course of many successive generations? If such do occur, can we doubt (remembering that many more individuals are born than can possibly survive) that individuals having any advantage, however slight, over others, would have the best chance of surviving and of procreating their kind? On the other hand, we may feel sure that any variation in the least degree injurious would be rigidly destroyed. This preservation of favourable individual differences and variations, and the destruction of those which are injurious, I have called Natural Selection, or the Survival of the Fittest. Variations neither

度上已变得具有可塑性。但是，正如霍克和阿沙·葛雷已明确提出的那样，我们在人工繁殖的动植物中几乎普遍遇到的变异并不是直接地由人类产生。人既不能创造变异，也不能阻止变异。他只能保留和积累确实已这样发生的变异。他无意识地把有机体放在新的并一直变化着的生存条件中，接着变异发生了。但是，生存条件的类似变化，可能甚至确实在自然界中也发生。我们还要清楚所有生物之间以及生物与其所处的自然环境间的相互关系是多么地复杂和密切。因此其构造上的无穷尽的变异对于生活在不断变化着的生存条件下的生物该有多大的用处。当看到有益于人类的变异确切地发生后，那么我们能否认为在广大而复杂的生存竞争中那些在某些方面有利于生物本身的其他变异会在生物后代身上发生呢？如果确实会发生（要记住个体生出的数量比最终生存下来个体的数量大得多），那么，我们能否猜测那些具有某种优越性的个体，不管这种优越是多么微小，将最有可能生存下来并繁殖其后代？从另一方面来讲，我们可以确定任何一种稍微有害的变异都会被无情地消灭。这种对有利的个体差异和变异的保留以及对不利变异的消除，我们称之为“自然选择”或“适者生存”。那些既无利又

useful nor injurious would not be affected by natural selection, and would be left either a fluctuating element, as perhaps we see in certain polymorphic species, or would ultimately become fixed, owing to the nature of the organism and the nature of the conditions.^⑦

Several writers have misapprehended or objected to the term Natural Selection. Some have even imagined that natural selection induces variability, whereas it implies only the preservation of such variations as arise and are beneficial to the being under its conditions of life. No one objects to agriculturists speaking of the potent effects of man's selection; and in this case the individual differences given by nature, which man for some object selects, must of necessity first occur. Others have objected that the term selection implies conscious choice in the animals which become modified;^⑧ and it has even been urged that, as plants have no volition,^⑨ natural selection is not applicable to them! In the literal sense of the word, no doubt, natural selection is a false term; but who ever objected to chemists speaking of the elective affinities^⑩ of the various elements? —and yet an acid cannot strictly be said to elect the base^⑪ with which it in preference combines. It has been said that I speak of natural selection as an active power or Deity; but who objects to an author speaking of the attraction of gravity^⑫ as ruling the movements of the planets? Every one knows what is meant and is implied by such metaphorical expressions; and they are almost necessary for brevity. So again it is difficult to

无害的变异不会受自然选择的影响，而且或者像我们在某些多态性的物种中可能看到的那样，将会成为不稳定的因素。或者由于生物本身以及环境的特性的影响而变得固定下来。

有些作者误解或反对“自然选择”这一术语，有些人甚至设想自然选择可引起变异，而其实它却意味着仅仅保留这些已产生的变异和在其生存条件中有利于生物的变异。没有人反对农学家所说的人工选择的巨大影响。不过在这种情况下，必须首先有自然发生出来的个体差异，人类才能按照某个目的来进行选择。另一些人反对“选择”这一术语，隐含着已变异的动物本身有意识的选择；而且他们还极力主张，由于植物没有意志力，“自然选择”对它们不适合。毫无疑问，照其字面意义来讲，自然选择是个错误的术语。但有谁曾反对化学家所称的各种元素间的“选择和亲和力”一词呢？然而我们不能严格地说一种酸会特意选择一种碱与之发生反应。据说，有人认为我曾说过的自然选择是一种能动力或神力，但有谁反对一位学者说万有引力是控制行星运行的力量呢？大家都清楚这一隐喻所表达的含意和寓意，而且这种隐喻几乎必须言简意赅。因此，很难避免把“自然”这个词语拟人

⑦这是个复杂的长句，
主要结构为：

variations would not...
and would... or would
...

⑧modify *v.* 变异。

⑨volition *n.* 意志力。

⑩affinity *n.* [化] 亲和性和性，亲和力。

⑪base *n.* 碱。

⑫gravity *n.* 万有引力。

avoid personifying the word Nature; but I mean by Nature, only the aggregate action and product of many natural laws, and by laws the sequence of events as ascertained by us. With a little familiarity such superficial objections will be forgotten.

We shall best understand the probable course of natural selection by taking the case of a country undergoing some slight physical change, for instance, of climate. The proportional numbers of its inhabitants will almost immediately undergo a change, and some species will probably become extinct. We may conclude, from what we have seen of the intimate and complex manner in which the inhabitants of each country are bound together, that any change in the numerical proportions of the inhabitants, independently of the change of climate itself, would seriously affect the others. If the country were open on its borders, new forms would certainly immigrate, and this would likewise seriously disturb the relations of some of the former inhabitants. Let it be remembered how powerful the influence of a single introduced tree or mammal has been shown to be. But in the case of an island, or of a country partly surrounded by barriers, into which new and better adapted forms could not freely enter, we should then have places in the economy of nature which would assuredly be better filled up, if some of the original inhabitants were in some manner modified,¹³ for, had the area been open to immigration, these same places would have been seized on by intruders. In such cases, slight modifications, which in any way favoured the individuals of any

化。但是我说的“自然”是指它是许多自然法则的综合作用及其产物，我所说的“法则”是指我们所确定的一系列事件。我相信在稍微熟悉后，我们会忘记那些肤浅的反对意见。

我们可通过一个国家地理上的例如气候上的细微变化来更好地理解自然选择的大致过程。这个地区，其生物数目的比例几乎立刻发生变化，而且有些物种可能会灭绝。我们已看到每一地区的生物相互联系方式的密切性与复杂性。由此我们得出这样一个结论：生物数量比例上的任何一个变化，即使不考虑气候变化的影响，也将严重影响其他生物。如果这个国家的边境是开放的，那么新的物种当然会迁移进来。然而这将同样严重地扰乱某些本地物种的关系。我们应当注意，从外地引进的一种树或一种哺乳类动物以后所产生的影响是多么巨大。若是在一个岛屿，或者在一个屏障环绕的国家中，新的适应力更强的物种不能自由地进入，如果一些原有的生物通过某种方式变异了，那么我们认为这些处于生态系统下的地区必定会到处充满这些变异的生物；而这些地区如果允许自由进入的话，它就会被入侵的外来物种占领。在这种情况下，那些在某方面对

⑬这是个复杂的条件状语从句，其中 *into which* 修饰 *an island or a country*，*if* 引导的从句置于后，正常语序为 *if some...we should...*

species, by better adapting them to their altered conditions, would tend to be preserved; and natural selection would have free scope for the work of improvement.

We have good reason to believe, as shown in the first chapter, that changes in the conditions of life give a tendency to increased variability; and in the foregoing cases the conditions have changed, and this would manifestly be favourable to natural selection, by affording a better chance of the occurrence of profitable variations. Unless such occur, natural selection can do nothing. Under the term of "variations," it must never be forgotten that mere individual differences are included. As man can produce a great result with his domestic animals and plants by adding up in any given direction individual differences, so could natural selection, but far more easily from having incomparably longer time for action. Nor do I believe that any great physical change,^⑩ as of climate, or any unusual degree of isolation to check immigration, is necessary in order that new and unoccupied places should be left, for natural selection to fill up by improving some of the varying inhabitants. For as all the inhabitants of each country are struggling together with nicely balanced forces,^⑪ extremely slight modifications in the structure or habits of one species would often give it an advantage over others; and still further modifications of the same kind would often still further increase the advantage, as long as the species continued under the same conditions of life and profited by similar means of subsistence and defence. No country can be

任何物种有利，并使其能更适应改变后的环境的微小变异将易于保留下来；而且自然选择会更广泛地进行物种的变异。

我们有足够的理由相信，如第一章所讲生活环境的变化有可能促使更多变异的发生。在前面的例子中，环境发生了变化，有益变异发生的机会增多，这对于自然选择显然是有利的。否则，自然选择也无法实现。需记住，所谓“变异”也包括单独的个体差异。正如人类能够通过在一方面的积累，在人工繁殖的动植物中产生显著的效果，自然选择也可以在野生动植物中做到这一点，但并不一定需要相当长的时间才发生作用。我并不认为必须有某一巨大的地理变化，如气候的变化或是任何不平常的隔离以阻止物种迁移，借以保留一些新的未被占据的地区，而后通过自然选择改善一些变异着的物种。因为当每一地区的所有生物都以微妙的均衡力量彼此竞争时，任何一种生物的结构或习性上的极其轻微的变异，都会优于其他生物；而且只要此物种在同样的环境下继续生活并通过相同的生存和防卫方式而获得收益，那么这一物种进一步的变异将会更加扩大它的优势。我们找不出一个地区，

⑭ physical change 地理变化。

⑮ nicely balanced forces 微妙的平衡力量。

named in which all the native inhabitants are now so perfectly adapted to each other and to the physical conditions under which they live, that none of them could be still better adapted or improved; for in all countries, the natives have been so far conquered by naturalised productions, that they have allowed some foreigners to take firm possession of the land. And as foreigners have thus in every country beaten some of the natives, we may safely conclude that the natives might have been modified with advantage, so as to have better resisted the intruders.

As man can produce, and certainly has produced, a great result by his methodical and unconscious means of selection, what may not natural selection effect? Man can act only on external and visible characters: Nature, if I may be allowed to personify the natural preservation or survival of the fittest, cares nothing for appearances, except in so far as they are useful to any being. She can act on every internal organ, on every shade of constitutional difference, on the whole machinery of life. Man selects only for his own good: Nature only for that of the being which she tends. Every selected character is fully exercised by her, as is implied by the fact of their selection. Man keeps the natives of many climates in the same country; he seldom exercises each selected character in some peculiar and fitting manner; he feeds a long and a short beaked pigeon on the same food; he does not exercise a long-backed or long-legged quadruped^⑩ in any peculiar manner; he exposes^⑪ sheep with long