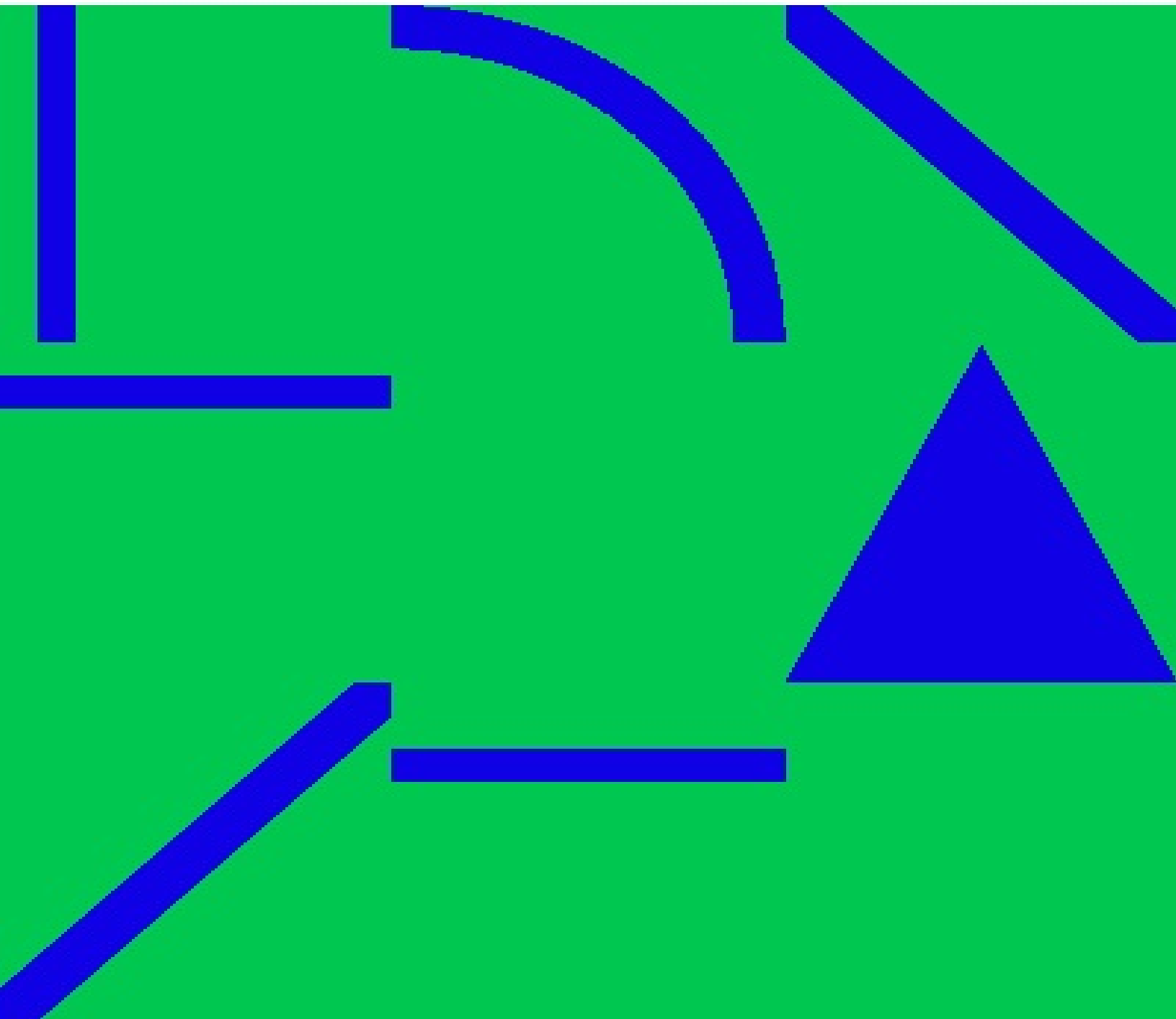


Time and Life

Mr. Darwin's "Origin of Species"

Thomas Henry Huxley



Rights for this book: [Public domain in the USA](#).

This edition is published by Project Gutenberg.

Originally [issued by Project Gutenberg](#) on 2001-11-01. To support the work of Project Gutenberg, visit their [Donation Page](#).

This free ebook has been produced by [GITenberg](#), a program of the [Free Ebook Foundation](#). If you have corrections or improvements to make to this ebook, or you want to use the source files for this ebook, visit [the book's github repository](#). You can support the work of the Free Ebook Foundation at their [Contributors Page](#).

The Project Gutenberg EBook of
Time and Life
by Thomas H. Huxley

#18 in our series by Thomas H. Huxley

Copyright laws are changing all over the world. Be sure to check the copyright laws for your country before downloading or redistributing this or any other Project Gutenberg eBook.

This header should be the first thing seen when viewing this Project Gutenberg file. Please do not remove it. Do not change or edit the header without written permission.

Please read the [“legal small print,”](#) and [other information](#) about the eBook and Project Gutenberg at the bottom of this file. Included is important information about your specific rights and restrictions in how the file may be used. You can also find out about how to make a donation to Project Gutenberg, and how to get involved.

****Welcome To The World of Free Plain Vanilla Electronic Texts****

****eBooks Readable By Both Humans and By Computers, Since 1971****

*******These eBooks Were Prepared By Thousands of Volunteers!*******

Title: Time and Life

Author: Thomas H. Huxley

Release Date: November, 2001 [Etext #2928]

[Yes, we are more than one year ahead of schedule]

[This HTML edition was first posted on April 7, 2003]

Edition: 10

Language: English

***** START OF THE PROJECT GUTENBERG EBOOK, TIME AND LIFE *****

This eBook was converted to HTML, with additional editing, by Jose Menendez from the text edition produced by Amy E. Zelmer.

TIME AND LIFE*

**MR. DARWIN'S
“ORIGIN OF SPECIES”**

BY

THOMAS H. HUXLEY

EVERYONE knows that that superficial film of the earth's substance, hardly ten miles thick, which is accessible to human investigation, is composed for the most part of beds or strata of stone, the consolidated muds and sands of former seas and lakes, which have been deposited one upon the other, and hence are the older the deeper they lie. These multitudinous strata present such resemblances and differences among themselves that they are capable of classification into groups or formations, and these formations again are brigaded together into still larger assemblages, called by the older geologists, primary, secondary, and tertiary; by the moderns, palaeozoic, mesozoic, and caenozoic: the basis of the former nomenclature being the relative age of the groups of strata; that of the latter, the kinds of living forms contained in them.

Though but a film if compared with the total diameter of our planet, the total series of formations is vast indeed when measured by any human standard, and, as all action implies time, so are we compelled to regard these mineral masses as a measure of the time which has elapsed during their accumulation. The amount of the time which they represent is, of course, in the inverse proportion of the intensity of the forces which have been in operation. If, in the ancient world, mud and sand accumulated on sea-bottoms at tenfold their present rate, it is clear that a bed of mud or sand ten feet thick would have been formed then in the same time as a stratum of similar materials one foot thick would be formed now, and *vice versa*.

At the outset of his studies, therefore, the physical geologist had to choose between two hypotheses; either, throughout the ages which are represented by the accumulated strata, and which we may call *geologic time*, the forces of nature have operated with much the same average intensity as at present, and hence the lapse of time which they represent must be something prodigious and inconceivable, or, in the primeval epochs, the natural powers were infinitely more intense than now, and hence the time through which they acted to produce the effects we see was comparatively short.

The earlier geologists adopted the latter view almost with one consent. For they had little knowledge of the present workings of nature, and they read the records of geologic time as a child reads the history of Rome or Greece, and fancies that antiquity was grand, heroic, and unlike the present because it is unlike his little experience of the present.

Even so the earlier observers were moved with wonder at the seeming contrast between the ancient and the present order of nature. The elemental forces seemed to have been grander and more energetic in primeval times. Upheaved and contorted, rifted and fissured, pierced by dykes of molten matter or worn away over vast areas by aqueous action, the older rocks appeared to bear witness to a state of things far different from that exhibited by the peaceful epoch on which the lot of man has fallen.

But by degrees thoughtful students of geology have been led to perceive that the earliest efforts of nature have been by no means the grandest. Alps and Andes are children of yesterday when compared with Snowdon and the Cumberland hills; and the so-called glacial epoch—that in which perhaps the most extensive physical changes of which any record remaining occurred—is the last and the newest of the revolutions of the globe. And in proportion as physical geography—which is the geology of our own epoch—has grown into a science, and the present

order of nature has been ransacked to find what, *hibernice*, we may call precedents for the phenomena of the past, so the apparent necessity of supposing the past to be widely different from the present has diminished.

The transporting power of the greatest deluge which can be imagined sinks into insignificance beside that of the slowly floating, slowly melting iceberg, or the glacier creeping along at its snail's pace of a yard a day. The study of the deltas of the Nile, the Ganges, and the Mississippi has taught us how slow is the wearing action of water, how vast its effects when time is allowed for its operation. The reefs of the Pacific, the deep-sea soundings of the Atlantic, show that it is to the slow-growing coral and to the imperceptible animalcule, which lives its brief space and then adds its tiny shell to the muddy cairn left by its brethren and ancestors, that we must look as the agents in the formation of limestone and chalk, and not to hypothetical oceans saturated with calcareous salts and suddenly depositing them.

And while the inquirer has thus learnt that existing forces—*give them time*—are competent to produce all the physical phenomena we meet with in the rocks, so, on the other side, the study of the marks left in the ancient strata by past physical actions shows that these were similar to those which now obtain. Ancient beaches are met with whose pebbles are like those found on modern shores; the hardened sea-sands of the oldest epochs show ripple-marks, such as may now be found on every sandy coast; nay, more, the pits left by ancient rain-drops prove that even in the very earliest ages, the “bow in the clouds” must have adorned the palaeozoic firmament. So that if we could reverse the legend of the Seven Sleepers,—if we could sleep back through the past, and awake a million ages before our own epoch, in the midst of the earliest geologic times,—there is no reason to believe that sea, or sky, or the aspect of the land would warn us of the marvellous retrospection.

Such are the beliefs which modern physical geologists hold, or, at any rate, tend towards holding. But, in so doing, it is obvious that they by no means prejudge the question, as to what the physical condition of the globe may have been before our chapters of its history begin, in what may be called (with that licence which is implied in the often-used term “prehistoric epoch”) “pre-geologic time.” The views indicated, in fact, are not only quite consistent with the hypothesis, that, in the still earlier period referred to, the condition of our world was very different; but they may be held by some to necessitate that hypothesis. The physical philosopher who is accurately acquainted with the velocity of a cannon-ball, and the precise character of the line which it traverses for a yard of its course, is necessitated by what he knows of the laws of nature to conclude that it came from a certain spot, whence it was impelled by a certain force, and that it has followed a certain trajectory. In like manner, the student of physical geology, who fully believes in the uniformity of the general condition of the earth through geologic time, may feel compelled by what he knows of causation, and by the general analogy of nature, to suppose that our solar system was once a nebulous mass; that it gradually condensed, that it broke up into that wonderful group of harmoniously rolling balls we call planets and satellites, and that then each of these underwent its appointed metamorphosis, until at last our own share of the cosmic vapour passed into that condition in which we first meet with definite records of its state, and in which it has since, with comparatively little change, remained.

The doctrine of uniformity and the doctrine of progression are, therefore, perfectly consistent; perhaps, indeed, they might be shown to be necessarily connected with one another.

If, however, the condition of the world, which has obtained throughout geologic time, is but the sequel to a vast series of changes which took place in pre-geologic time, then it seems not unlikely that the duration of this latter is to that of the former as the vast extent of geologic

time is to the length of the brief epoch we call the historical period; and that even the oldest rocks are records of an epoch almost infinitely remote from that which could have witnessed the first shaping of our globe.

It is probable that no modern geologist would hesitate to admit the general validity of these reasonings when applied to the physics of his subject, whence it is the more remarkable that the moment the question changes from one of physics and chemistry to one of natural history, scientific opinions and the popular prejudices, which reflect them in a distorted form, undergo a sudden metamorphosis. Geologists and palaeontologists write about the “beginning of life” and the “first-created forms of living beings,” as if they were the most familiar things in the world; and even cautious writers seem to be on quite friendly terms with the “archetype” whereby the Creator was guided “amidst the crash of falling worlds.” Just as it used to be imagined that the ancient world was physically opposed to the present, so it is still widely assumed that the living population of our globe, whether animal or vegetable, in the older epochs, exhibited forms so strikingly contrasted with those which we see around us, that there is hardly anything in common between the two. It is constantly tacitly assumed that we have before us all the forms of life which have ever existed; and though the progress of knowledge, yearly and almost monthly, drives the defenders of that position from their ground, they entrench themselves in the new line of defences as if nothing had happened, and proclaim that the *new* beginning is the *real* beginning.

Without for an instant denying or endeavouring to soften down the considerable positive differences (the negative ones are met by another line of argument) which undoubtedly obtain between the ancient and the modern worlds of life, we believe they have been vastly overstated and exaggerated, and this belief is based upon certain facts whose value does not seem to have been fully appreciated, though they have long been more or less completely known.

The multitudinous kinds of animals and plants, both recent and fossil, are, as is well known, arranged by zoologists and botanists, in accordance with their natural relations, into groups which receive the names of sub-kingdoms, classes, orders, families, genera and species. Now it is a most remarkable circumstance that, viewed on the great scale, living beings have differed so little throughout all geologic time that there is no sub-kingdom and no class wholly extinct or without living representatives.

If we descend to the smaller groups, we find that the number of orders of plants is about two hundred; and I have it on the best authority that not one of these is exclusively fossil; so that there is absolutely not a single extinct ordinal type of vegetable life; and it is not until we descend to the next group, or the families, that we find types which are wholly extinct. The number of orders of animals, on the other hand, may be reckoned at a hundred and twenty, or thereabouts, and of these, eight or nine have no living representatives. The proportion of extinct ordinal types of animals to the existing types, therefore, does not exceed seven per cent.—a marvellously small proportion when we consider the vastness of geologic time.

Another class of considerations—of a different kind, it is true, but tending in the same direction—seems to have been overlooked. Not only is it true that the general plan of construction of animals and plants has been the same in all recorded time as at present, but there are particular kinds of animals and plants which have existed throughout vast epochs, sometimes through the whole range of recorded time, with very little change. By reason of this persistency, the typical form of such a kind might be called a “persistent type,” in contradistinction to those types which have appeared for but a short time in the course of the world’s history. Examples of these persistent types are abundant enough in both the vegetable and the animal kingdoms. The oldest group of plants with which we are well acquainted is that

of whose remains coal is constituted; and as far as they can be identified, the carboniferous plants are ferns, or club-mosses, or Coniferae, in many cases generically identical with those now living!

Among animals, instances of the same kind may be found in every sub-kingdom. The *Globigerina* of the Atlantic soundings is identical with that which occurs in the chalk; and the casts of lower silurian *Foraminifera*, which Ehrenberg has recently described, seem to indicate the existence at that remote period of forms singularly like those which now exist. Among the corals, the palaeozoic *Tabulata* are constructed on precisely the same type as the modern millepores; and if we turn to molluscs, the most competent malacologists fail to discover any generic distinction between the *Crania*, *Lingulae* and *Discinae* of the silurian rocks and those which now live. Our existing *Nautilus* has its representative species in every great formation, from the oldest to the newest; and *Loligo*, the squid of modern seas, appears in the lias, or at the bottom of the mesozoic series, in a form, at most, specifically different from its living congeners. In the great assemblage of annulose animals, the two highest classes, the insects and spider tribe, exhibit a wonderful persistency of type. The cockroaches of the carboniferous epoch are exceedingly similar to those which now run about our coal-cellars; and its locusts, termites and dragon-flies are closely allied to the members of the same groups which now chirrup about our fields, undermine our houses, or sail with swift grace about the banks of our sedgy pools. And, in like manner, the palaeozoic scorpions can only be distinguished by the eye of a naturalist from the modern ones.

Finally, with respect to the *Vertebrata*, the same law holds good: certain types, such as those of the ganoid and placoid fishes, having persisted from the palaeozoic epoch to the present time without a greater amount of deviation from the normal standard than that which is seen within the limits of the group as it now exists. Even among the *Reptilia*—the class which exhibits the largest proportion of entirely extinct forms of any one type,—that of the *Crocodylia*, has persisted from at least the commencement of the mesozoic epoch up to the present time with so much constancy, that the amount of change which it exhibits may fairly, in relation to the time which has elapsed, be called insignificant. And the imperfect knowledge we have of the ancient mammalian population of our earth leads to the belief that certain of its types, such as that of the *Marsupialia*, have persisted with correspondingly little change through a similar range of time.

Thus it would appear to be demonstrable, that, notwithstanding the great change which is exhibited by the animal population of the world as a whole, certain types have persisted comparatively without alteration, and the question arises, What bearing have such facts as these on our notions of the history of life through geological time? The answer to this question would seem to depend on the view we take respecting the origin of species in general. If we assume that every species of animal and of plant was formed by a distinct act of creative power, and if the species which have incessantly succeeded one another were placed upon the globe by these separate acts, then the existence of persistent types is simply an unintelligible irregularity. Such assumption, however, is as unsupported by tradition or by Revelation as it is opposed by the analogy of the rest of the operations of nature; and those who imagine that, by adopting any such hypothesis, they are strengthening the hands of the advocates of the letter of the Mosaic account, are simply mistaken. If, on the other hand, we adopt that hypothesis to which alone the study of physiology lends any support—that hypothesis which, having struggled beyond the reach of those fatal supporters, the Telliameds and Vestigiarians, who so nearly caused its suffocation by wind in early infancy, is now winning at least the provisional assent of all the best thinkers of the day—the hypothesis that the forms or species of living beings, as we know them, have

been produced by the gradual modification of pre-existing species—then the existence of persistent types seems to teach us much. Just as a small portion of a great curve appears straight, the apparent absence of change in direction of the line being the exponent of the vast extent of the whole, in proportion to the part we see; so, if it be true that all living species are the result of the modification of other and simpler forms, the existence of these little altered persistent types, ranging through all geological time, must indicate that they are but the final terms of an enormous series of modifications, which had their being in the great lapse of pregeologic time, and are now perhaps for ever lost.

In other words, when rightly studied, the teachings of palaeontology are at one with those of physical geology. Our farthest explorations carry us back but a little way above the mouth of the great river of Life: where it arose, and by what channels the noble tide has reached the point when it first breaks upon our view, is hidden from us.

The foregoing pages contain the substance of a lecture delivered before the Royal Institution of Great Britain many months ago, and of course long before the appearance of the remarkable work on the “Origin of Species” just published by Mr. Darwin, who arrives at very similar conclusions. Although, in one sense, I might fairly say that my own views have been arrived at independently, I do not know that I can claim any equitable right to property in them; for it has long been my privilege to enjoy Mr. Darwin’s friendship, and to profit by corresponding with him, and by, to some extent, becoming acquainted with the workings of his singularly original and well-stored mind. It was in consequence of my knowledge of the general tenor of the researches in which Mr. Darwin had been so long engaged; because I had the most complete confidence in his perseverance, his knowledge, and, above all things, his high-minded love of truth; and, moreover, because I found that the better I became acquainted with the opinions of the best naturalists regarding the vexed question of species, the less fixed they seemed to be, and the more inclined they were to the hypothesis of gradual modification, that I ventured to speak as strongly as I have done in the final paragraphs of my discourse.

Thus, my daw having so many borrowed plumes, I see no impropriety in making a tail to this brief paper by taking another handful of feathers from Mr. Darwin; endeavouring to point out in a few words, in fact, what, as I gather from the perusal of his book, his doctrines really are, and on what sort of basis they rest. And I do this the more willingly, as I observe that already the hastier sort of critics have begun, not to review my friend’s book, but to howl over it in a manner which must tend greatly to distract the public mind.

No one will be better satisfied than I to see Mr. Darwin’s book refuted, if any person be competent to perform that feat; but I would suggest that refutation is retarded, not aided, by mere sarcastic misrepresentation. Every one who has studied cattle-breeding, or turned pigeon-fancier, or “pomologist,” must have been struck by the extreme modifiability or plasticity of those kinds of animals and plants which have been subjected to such artificial conditions as are imposed by domestication. Breeds of dogs are more different from one another than are the dog and the wolf; and the purely artificial races of pigeons, if their origin were unknown, would most assuredly be reckoned by naturalists as distinct species and even genera.

These breeds are always produced in the same way. The breeder selects a pair, one or other, or both, of which present an indication of the peculiarity he wishes to perpetuate, and then selects from the offspring of them those which are most characteristic, rejecting the others. From the selected offspring he breeds again, and, taking the same precautions as before,

repeats the process until he has obtained the precise degree of divergence from the primitive type at which he aimed.

If he now breeds from the variety thus established for some generations, taking care always to keep the stock pure, the tendency to produce this particular variety becomes more and more strongly hereditary; and it does not appear that there is any limit to the persistency of the race thus developed.

Men like Lamarck, apprehending these facts, and knowing that varieties comparable to those produced by the breeder are abundantly found in nature, and finding it impossible to discriminate in some cases between varieties and true species, could hardly fail to divine the possibility that species even the most distinct were, after all, only exceedingly persistent varieties, and that they had arisen by the modification of some common stock, just as it is with good reason believed that turnspits and greyhounds, carrier and tumbler pigeons, have arisen.

But there was a link wanting to complete the parallel. Where in nature was the analogue of the breeder to be found? How could that operation of selection, which is his essential function, be carried out by mere natural agencies? Lamarck did not value this problem; neither did he admit his impotence to solve it; but he guessed a solution. Now, guessing in science is a very hazardous proceeding, and Lamarck's reputation has suffered woefully for the absurdities into which his baseless suppositions led him.

Lamarck's conjectures, equipped with a new hat and stick, as Sir Walter Scott was wont to say of an old story renovated, formed the foundation of the biological speculations of the "Vestiges," a work which has done more harm to the progress of sound thought on these matters than any that could be named; and, indeed, I mention it here simply for the purpose of denying that it has anything in common with what essentially characterises Mr. Darwin's work.

The peculiar feature of the latter is, in fact, that it professes to tell us what in nature takes the place of the breeder; what it is that favours the development of one variety into which a species may run, and checks that of another; and, finally, shows how this natural selection, as it is termed, may be the physical cause of the production of species by modification.

That which takes the place of the breeder and selector in nature is Death. In a most remarkable chapter, "On the Struggle for Existence," Mr. Darwin draws attention to the marvellous destruction of life which is constantly going on in nature. For every species of living thing, as for man, "*Eine Bresche ist ein jeder Tag*."—Every species has its enemies; every species has to compete with others for the necessities of existence; the weakest goes to the wall, and death is the penalty inflicted on all laggards and stragglers. Every variety to which a species may give rise is either worse or better adapted to surrounding circumstances than its parent. If worse, it cannot maintain itself against death, and speedily vanishes again. But if better adapted, it must, sooner or later, "improve" its progenitor from the face of the earth, and take its place. If circumstances change, the victor will be similarly supplanted by its own progeny; and thus, by the operation of natural causes, unlimited modification may in the lapse of long ages occur.

For an explanation of what I have here called vaguely "surrounding circumstances," and of why they continually change—for ample proof that the "struggle for existence" is a very great reality, and assuredly *tends* to exert the influence ascribed to it—I must refer to Mr. Darwin's book. I believe I have stated fairly the position upon which his whole theory must stand or fall; and it is not my purpose to anticipate a full review of his work. If it can be proved that the process of natural selection, operating upon any species, can give rise to varieties of species so different from one another that none of our tests will distinguish them from true species, Mr. Darwin's hypothesis of the origin of species will take its place among the

established theories of science, be its consequences whatever they may. If, on the other hand, Mr. Darwin has erred, either in fact or in reasoning, his fellow-workers will soon find out the weak points in his doctrines, and their extinction by some nearer approximation to the truth will exemplify his own principle of natural selection.

In either case the question is one to be settled only by the painstaking, truth-loving investigation of skilled naturalists. It is the duty of the general public to await the result in patience; and, above all things, to discourage, as they would any other crimes, the attempt to enlist the prejudices of the ignorant, or the uncharitableness of the bigoted, on either side of the controversy.

* “Macmillan’s Magazine,” December 1859.

*** END OF THE PROJECT GUTENBERG EBOOK, TIME AND LIFE ***

This file should be named thx0810h.htm or thx0810h.zip
Corrected EDITIONS of our eBooks get a new NUMBER, thx0811h.htm
VERSIONS based on separate sources get new LETTER, thx0810a.htm

Project Gutenberg eBooks are often created from several printed editions, all of which are confirmed as Public Domain in the US unless a copyright notice is included. Thus, we usually do not keep eBooks in compliance with any particular paper edition.

We are now trying to release all our eBooks one year in advance of the official release dates, leaving time for better editing. Please be encouraged to tell us about any error or corrections, even years after the official publication date.

Please note neither this listing nor its contents are final til midnight of the last day of the month of any such announcement. The official release date of all Project Gutenberg eBooks is at Midnight, Central Time, of the last day of the stated month. A preliminary version may often be posted for suggestion, comment and editing by those who wish to do so.

Most people start at our Web sites at:

<http://gutenberg.net> or
<http://promo.net/pg>

These Web sites include award-winning information about Project Gutenberg, including how to donate, how to help produce our new eBooks, and how to subscribe to our email newsletter (free!).

Those of you who want to download any eBook before announcement can get to them as follows, and just download by date. This is also a good way to get them instantly upon announcement, as the indexes our cataloguers produce obviously take a while after an announcement goes out in the Project Gutenberg Newsletter.

<http://www.ibiblio.org/gutenberg/etext04> or
<ftp://ftp.ibiblio.org/pub/docs/books/gutenberg/etext04>

Or /etext03, 02, 01, 00, 99, 98, 97, 96, 95, 94, 93, 92, 91 or 90

Just search by the first five letters of the filename you want, as it appears in our Newsletters.

Information about Project Gutenberg (one page)

We produce about two million dollars for each hour we work. The time it takes us, a rather conservative estimate, is fifty hours to get any eBook selected, entered, proofread, edited, copyright searched and analyzed, the copyright letters written, etc. Our projected audience is one hundred million readers. If the value per text is nominally estimated at one dollar then we produce \$2 million dollars per hour in 2002 as we release over 100 new text files per month: 1240 more eBooks in 2001 for a total of 4000+ We are already on our way to trying for 2000 more eBooks in 2002 If they reach just 1–2% of the world’s population then the total will reach over half a trillion eBooks given away by year’s end.

The Goal of Project Gutenberg is to Give Away 1 Trillion eBooks! This is ten thousand titles each to one hundred million readers, which is only about 4% of the present number of computer users.

Here is the briefest record of our progress (* means estimated):

eBooks	Year	Month
1	1971	July
10	1991	January
100	1994	January
1000	1997	August
1500	1998	October
2000	1999	December
2500	2000	December
3000	2001	November
4000	2001	October/November
6000	2002	December*
9000	2003	November*
10000	2004	January*

The Project Gutenberg Literary Archive Foundation has been created to secure a future for Project Gutenberg into the next millennium.

We need your donations more than ever!

As of February, 2002, contributions are being solicited from people and organizations in: Alabama, Alaska, Arkansas, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois,

Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

We have filed in all 50 states now, but these are the only ones that have responded.

As the requirements for other states are met, additions to this list will be made and fund raising will begin in the additional states. Please feel free to ask to check the status of your state.

In answer to various questions we have received on this:

We are constantly working on finishing the paperwork to legally request donations in all 50 states. If your state is not listed and you would like to know if we have added it since the list you have, just ask.

While we cannot solicit donations from people in states where we are not yet registered, we know of no prohibition against accepting donations from donors in these states who approach us with an offer to donate.

International donations are accepted, but we don't know ANYTHING about how to make them tax-deductible, or even if they CAN be made deductible, and don't have the staff to handle it even if there are ways.

Donations by check or money order may be sent to:

Project Gutenberg Literary Archive Foundation
PMB 113
1739 University Ave.
Oxford, MS 38655-4109

Contact us if you want to arrange for a wire transfer or payment method other than by check or money order.

The Project Gutenberg Literary Archive Foundation has been approved by the US Internal Revenue Service as a 501(c)(3) organization with EIN [Employee Identification Number] 64-622154. Donations are tax-deductible to the maximum extent permitted by law. As fund-raising requirements for other states are met, additions to this list will be made and fund-raising will begin in the additional states.

We need your donations more than ever!

You can get up to date donation information online at:

<http://www.gutenberg.net/donation.html>

If you can't reach Project Gutenberg,
you can always email directly to:

Michael S. Hart hart@pobox.com

Prof. Hart will answer or forward your message.

We would prefer to send you information by email.

****The Legal Small Print****

(Three Pages)

*****START**THE SMALL PRINT!**FOR PUBLIC DOMAIN EBOOKS**START*****

Why is this “Small Print!” statement here? You know: lawyers. They tell us you might sue us if there is something wrong with your copy of this eBook, even if you got it for free from someone other than us, and even if what’s wrong is not our fault. So, among other things, this “Small Print!” statement disclaims most of our liability to you. It also tells you how you may distribute copies of this eBook if you want to.

***BEFORE!* YOU USE OR READ THIS EBOOK**

By using or reading any part of this PROJECT GUTENBERG–tm eBook, you indicate that you understand, agree to and accept this “Small Print!” statement. If you do not, you can receive a refund of the money (if any) you paid for this eBook by sending a request within 30 days of receiving it to the person you got it from. If you received this eBook on a physical medium (such as a disk), you must return it with your request.

ABOUT PROJECT GUTENBERG–TM EBOOKS

This PROJECT GUTENBERG–tm eBook, like most PROJECT GUTENBERG–tm eBooks, is a “public domain” work distributed by Professor Michael S. Hart through the Project Gutenberg Association (the “Project”). Among other things, this means that no one owns a United States copyright on or for this work, so the Project (and you!) can copy and distribute it in the United States without permission and without paying copyright royalties. Special rules, set forth below, apply if you wish to copy and distribute this eBook under the “PROJECT GUTENBERG” trademark.

Please do not use the “PROJECT GUTENBERG” trademark to market any commercial products without permission.

To create these eBooks, the Project expends considerable efforts to identify, transcribe and proofread public domain works. Despite these efforts, the Project’s eBooks and any medium they may be on may contain “Defects”. Among other things, Defects may take the form of incomplete, inaccurate or corrupt data, transcription errors, a copyright or other intellectual property infringement, a defective or damaged disk or other eBook medium, a computer virus, or computer codes that damage or cannot be read by your equipment.

LIMITED WARRANTY; DISCLAIMER OF DAMAGES

But for the “Right of Replacement or Refund” described below, [1] Michael Hart and the Foundation (and any other party you may receive this eBook from as a PROJECT GUTENBERG–tm eBook) disclaims all liability to you for damages, costs and expenses, including legal fees, and [2] YOU HAVE NO REMEDIES FOR NEGLIGENCE OR UNDER STRICT LIABILITY, OR FOR BREACH OF

WARRANTY OR CONTRACT, INCLUDING BUT NOT LIMITED TO INDIRECT, CONSEQUENTIAL, PUNITIVE OR INCIDENTAL DAMAGES, EVEN IF YOU GIVE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

If you discover a Defect in this eBook within 90 days of receiving it, you can receive a refund of the money (if any) you paid for it by sending an explanatory note within that time to the person you received it from. If you received it on a physical medium, you must return it with your note, and such person may choose to alternatively give you a replacement copy. If you received it electronically, such person may choose to alternatively give you a second opportunity to receive it electronically.

THIS EBOOK IS OTHERWISE PROVIDED TO YOU “AS-IS”. NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, ARE MADE TO YOU AS TO THE EBOOK OR ANY MEDIUM IT MAY BE ON, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Some states do not allow disclaimers of implied warranties or the exclusion or limitation of consequential damages, so the above disclaimers and exclusions may not apply to you, and you may have other legal rights.

INDEMNITY

You will indemnify and hold Michael Hart, the Foundation, and its trustees and agents, and any volunteers associated with the production and distribution of Project Gutenberg-tm texts harmless, from all liability, cost and expense, including legal fees, that arise directly or indirectly from any of the following that you do or cause: [1] distribution of this eBook, [2] alteration, modification, or addition to the eBook, or [3] any Defect.

DISTRIBUTION UNDER “PROJECT GUTENBERG–tm”

You may distribute copies of this eBook electronically, or by disk, book or any other medium if you either delete this “Small Print!” and all other references to Project Gutenberg, or:

Only give exact copies of it. Among other things, this requires that you do not remove, alter or modify the eBook or this “small print!” statement. You may however, if you wish, [1] distribute this eBook in machine readable binary, compressed, mark-up, or proprietary form, including any form resulting from conversion by word processing or hypertext software, but only so long as *EITHER*:

[*] The eBook, when displayed, is clearly readable, and does *not* contain characters other than those intended by the author of the work, although tilde (~), asterisk (*) and underline (_) characters may be used to convey punctuation intended by the author, and additional characters may be used to indicate hypertext links; OR

[*] The eBook may be readily converted by the reader at no expense into plain ASCII, EBCDIC or equivalent form by the program that displays the eBook (as is the case, for instance, with most word processors); OR

You provide, or agree to also provide on request at no additional cost, fee or expense, a [*] copy of the eBook in its original plain ASCII form (or in EBCDIC or other equivalent proprietary form).

[2] Honor the eBook refund and replacement provisions of this “Small Print!” statement.

[3] Pay a trademark license fee to the Foundation of 20% of the gross profits you derive calculated using the method you already use to calculate your applicable taxes. If you don't derive profits, no royalty is due. Royalties are payable to "Project Gutenberg Literary Archive Foundation" the 60 days following each date you prepare (or were legally required to prepare) your annual (or equivalent periodic) tax return. Please contact us beforehand to let us know your plans and to work out the details.

WHAT IF YOU *WANT* TO SEND MONEY EVEN IF YOU DON'T HAVE TO?

Project Gutenberg is dedicated to increasing the number of public domain and licensed works that can be freely distributed in machine readable form.

The Project gratefully accepts contributions of money, time, public domain materials, or royalty free copyright licenses. Money should be paid to the:
"Project Gutenberg Literary Archive Foundation."

If you are interested in contributing scanning equipment or software or other items, please contact Michael Hart at:
hart@pobox.com

[Portions of this eBook's header and trailer may be reprinted only when distributed free of all fees. Copyright (C) 2001, 2002 by Michael S. Hart. Project Gutenberg is a TradeMark and may not be used in any sales of Project Gutenberg eBooks or other materials be they hardware or software or any other related product without express permission.]

*END THE SMALL PRINT! FOR PUBLIC DOMAIN EBOOKS*Ver.02/11/02*END*