

# DOWNLOAD PDF SELECTED LETTERS ON EVOLUTION AND ORIGIN OF SPECIES

## Chapter 1 : Darwin Online: On the Origin of Species

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Life and letters of Charles Darwin. Selected letters on evolution and origin of species  
Description: Dover edition. Mineola, New York: Dover Publications, Inc. Originally published: Life and letters of Charles Darwin. Naturalists' Great Britain. Biography. Moritz where I worked at it, and therefore with you. To render this feasible, large numbers of the more purely scientific letters are omitted, or reprinted by the citation of a few sentences. It was his habit to work more or less simultaneously at several subjects. Experimental work was often carried on as a refreshment or variety, while books on tailoring reason in general and the marshalling of large bodies of facts were being written. More of his researches were dropped only to be resumed after years had elapsed. With regard to Chapter IV. Cameroon who has allowed me to reproduce the late Mrs. Darwin was a son of Erasmus Darwin, so sometimes described as a poet, but more deservedly known as physician and naturalist. If such speculations are permissible, we may hazard the guess that Charles Darwin inherited his sweetness of disposition from the Wedgwood side, while the character of his genius came rather from the Darwin grand father. He was a man of a quick, vivid temperament, with a lively interest in even the smaller details in the lives of those with whom he came in contact. Darwin lived before his marriage for two or three years on St. Spencer Philip's, and has undergone but little alteration. Marianne, married Dr. Charles Langton. Translated from the German by W. Dallas, 1878. I tried to make out the names of plants, and collected all sorts of things, shells, seals, franks, coins, and minerals. The passion for collecting which leads a man to be a systematic naturalist, a virtuoso, or a miser, was very strong in me, and was clearly innate, as none of my sisters or brothers ever had this taste.

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## Chapter 2 : Selected Letters on Evolution and Origin of Species

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Despite periodic fluctuations, populations remain roughly the same size fact. Resources such as food are limited and are relatively stable over time fact. A struggle for survival ensues inference. Individuals in a population vary significantly from one another fact. Much of this variation is heritable fact. Individuals less suited to the environment are less likely to survive and less likely to reproduce; individuals more suited to the environment are more likely to survive and more likely to reproduce and leave their heritable traits to future generations, which produces the process of natural selection fact. This slowly effected process results in populations changing to adapt to their environments, and ultimately, these variations accumulate over time to form new species inference. Nature was widely believed to be unstable and capricious, with monstrous births from union between species, and spontaneous generation of life. After the turmoil of the English Civil War , the Royal Society wanted to show that science did not threaten religious and political stability. John Ray developed an influential natural theology of rational order; in his taxonomy , species were static and fixed, their adaptation and complexity designed by God, and varieties showed minor differences caused by local conditions. The biological classification introduced by Carl Linnaeus in also viewed species as fixed according to the divine plan. In , Georges Buffon suggested that some similar species, such as horses and asses, or lions, tigers, and leopards, might be varieties descended from a common ancestor. Wernerians thought strata were deposits from shrinking seas , but James Hutton proposed a self-maintaining infinite cycle, anticipating uniformitarianism. Both envisaged that spontaneous generation produced simple forms of life that progressively developed greater complexity, adapting to the environment by inheriting changes in adults caused by use or disuse. This process was later called Lamarckism. Lamarck thought there was an inherent progressive tendency driving organisms continuously towards greater complexity, in parallel but separate lineages with no extinction. Georges Cuvier strongly disputed such ideas, holding that unrelated, fixed species showed similarities that reflected a design for functional needs. All naturalists in the two English universities Oxford and Cambridge were Church of England clergymen, and science became a search for these laws. Grant revealed his enthusiasm for the transmutation of species, but Darwin rejected it. Filled with zeal for science, he studied catastrophist geology with Adam Sedgwick. In December , he joined the Beagle expedition as a gentleman naturalist and geologist. Darwin discovered fossils resembling huge armadillos , and noted the geographical distribution of modern species in hope of finding their "centre of creation". At the zoo he had his first sight of an ape, and was profoundly impressed by how human the orangutan seemed. In November , the anonymously published popular science book *Vestiges of the Natural History of Creation* , written by Scottish journalist Robert Chambers , widened public interest in the concept of transmutation of species. *Vestiges* used evidence from the fossil record and embryology to support the claim that living things had progressed from the simple to the more complex over time. Darwin read it soon after publication, and scorned its amateurish geology and zoology, [41] but he carefully reviewed his own arguments after leading scientists, including Adam Sedgwick, attacked its morality and scientific errors. While few naturalists were willing to consider transmutation, Herbert Spencer became an active proponent of Lamarckism and progressive development in the s. Reminded of his lack of expertise in taxonomy , Darwin began an eight-year study of barnacles , becoming the leading expert on their classification. Using his theory, he discovered homologies showing that slightly changed body parts served different functions to meet new conditions, and he found an intermediate stage in the evolution of distinct sexes. In , he completed the last part of his Beagle-related writing and began working full-time on evolution. He now realised that the branching pattern of evolutionary divergence was explained by natural selection working constantly to improve adaptation. His thinking changed from the view that species formed in isolated populations only , as on islands, to an emphasis on speciation without isolation

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; that is, he saw increasing specialisation within large stable populations as continuously exploiting new ecological niches. He conducted empirical research focusing on difficulties with his theory. He studied the developmental and anatomical differences between different breeds of many domestic animals, became actively involved in fancy pigeon breeding, and experimented with the help of his son Francis on ways that plant seeds and animals might disperse across oceans to colonise distant islands. By , his theory was much more sophisticated, with a mass of supporting evidence. Reasons suggested have included fear of religious persecution or social disgrace if his views were revealed, and concern about upsetting his clergymen naturalist friends or his pious wife Emma. His paper on Glen Roy had proved embarrassingly wrong, and he may have wanted to be sure he was correct. Darwin always finished one book before starting another. While he was researching, he told many people about his interest in transmutation without causing outrage. He firmly intended to publish, but it was not until September that he could work on it full-time. His estimate that writing his "big book" would take five years proved optimistic. Darwin was torn between the desire to set out a full and convincing account and the pressure to quickly produce a short paper. He met Lyell, and in correspondence with Joseph Dalton Hooker affirmed that he did not want to expose his ideas to review by an editor as would have been required to publish in an academic journal. He began a "sketch" account on 14 May , and by July had decided to produce a full technical treatise on species as his "big book" on Natural Selection. His theory including the principle of divergence was complete by 5 September when he sent Asa Gray a brief but detailed abstract of his ideas. Darwin described natural selection as being analogous to the artificial selection practised by animal breeders, and emphasised competition between individuals; Wallace drew no comparison to selective breeding , and focused on ecological pressures that kept different varieties adapted to local conditions. On 28 March Darwin wrote to Lyell asking about progress, and offering to give Murray assurances "that my Book is not more un-orthodox, than the subject makes inevitable. The third edition came out in , with a number of sentences rewritten or added and an introductory appendix, An Historical Sketch of the Recent Progress of Opinion on the Origin of Species, [85] while the fourth in had further revisions. The fifth edition, published on 10 February , incorporated more changes and for the first time included the phrase "survival of the fittest", which had been coined by the philosopher Herbert Spencer in his Principles of Biology Darwin had told Murray of working men in Lancashire clubbing together to buy the 5th edition at fifteen shillings and wanted it made more widely available; the price was halved to 7 s 6 d by printing in a smaller font. It includes a glossary compiled by W. Book sales increased from 60 to per month. In a May letter, Darwin mentioned a print run of 2, copies, but it is not clear if this referred to the first printing only as there were four that year. Darwin corresponded with Royer about a second edition published in and a third in , but he had difficulty getting her to remove her notes and was troubled by these editions. By , it had appeared in an additional 18 languages. The existence of two rhea species with overlapping ranges influenced Darwin. These facts seemed to me to throw some light on the origin of speciesâ€”that mystery of mysteries, as it has been called by one of our greatest philosophers. He mentions his years of work on his theory, and the arrival of Wallace at the same conclusion, which led him to "publish this Abstract" of his incomplete work. He outlines his ideas, and sets out the essence of his theory: As many more individuals of each species are born than can possibly survive; and as, consequently, there is a frequently recurring struggle for existence, it follows that any being, if it vary however slightly in any manner profitable to itself, under the complex and sometimes varying conditions of life, will have a better chance of surviving, and thus be naturally selected. From the strong principle of inheritance, any selected variety will tend to propagate its new and modified form. Darwin discusses contemporary opinions on the origins of different breeds under cultivation to argue that many have been produced from common ancestors by selective breeding. Ancon sheep with short legs , and 2 ubiquitous small differences example: However, for Darwin the small changes were most important in evolution. In Chapter II, Darwin specifies that the distinction between species and varieties is arbitrary, with experts disagreeing and changing their decisions when new forms were found. He concludes that "a well-marked variety may be justly called an incipient species" and that "species are only strongly marked and permanent

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varieties". Darwin and Wallace made variation among individuals of the same species central to understanding the natural world. Herbert Spencer , of the *Survival of the Fittest* , is more accurate, and is sometimes equally convenient. Darwin emphasizes that he used the phrase " struggle for existence.

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## Chapter 3 : evolution | Theory, Examples, & Facts | [www.nxgvision.com](http://www.nxgvision.com)

*Selected Letters on Evolution and Origin of Species Charles Darwin, Francis Darwin, Selected Letters on Evolution and Origin of Species* ISBN: | | EPUB | pages | 2 MB This book provides a behind-the-scenes look at one of the most powerful and revolutionary ideas in world history.

Darwin and Wallace rewrite the theory of evolution Darwin and Wallace presented their accounts of evolution at the same meeting Darwin finally went public with his groundbreaking theory of evolution by natural selection, while making sure that Wallace received some credit. Wallace, on his return, accepted that Darwin had treated him fairly. But Darwin missed the presentation. A private tragedy struck: I am quite prostrated, and can do nothing I hardly care about it. It would become one of the most important books ever written. He dreaded losing his reputation, as his grandfather Erasmus had. Charles did draw fierce criticism from the Church, and from some parts of the press. However, some were now willing to listen to evidence for evolution especially from a leading figure like Darwin. One general law, leading to the advancement of all organic beings, namely, multiply, vary, let the strongest live and the weakest die. Andrew Marr re-enacts key moments from the Oxford Debate. It was left to others notably a young biologist named Thomas Huxley to take up the fight. In the 19th Century, scientific talks were popular entertainment and any debate about evolution was sure to draw crowds. In what many saw as a key battle between science and God, Huxley went head to head with Bishop Samuel Wilberforce and his Biblical account of creation. Both sides claimed victory. The debate has become part of the Darwin legend and shows how his ideas shook Victorian society. A witness recalls the Oxford University debate A worrying inheritance Charles Darwin and his son William, taken in Darwin wrote a warning about close relatives having children, buried in an obscure botanical textbook. He was already worried about his own marriage. Darwin and his cousin Emma had ten children and Charles was a devoted father. Yet the couple had now lost a son and two daughters, and nursed others through illness. Darwin knew that orchids were less healthy when they self-fertilised and worried that inbreeding within his own family may have caused problems. Yet when Darwin lobbied to add questions on cousin-marriage to the census he was refused. Queen Victoria had married her cousin, and Darwin was challenging another taboo. Nature thus tells us, in the most emphatic manner, that she abhors perpetual self-fertilisation. Each has adapted to its environment. *Origin of Species* was a bestseller worldwide and went into multiple editions. With each new edition, Darwin strengthened his arguments. By responding to critics, he was able to build a more robust case. The book was another challenge to Christian orthodoxy. Yet in the decade since Darwin had gone public, his ideas had gained acceptance. I have little strength and feel very old. Darwin describes his final book: He died a virtual recluse, surrounded by his wife and a few devoted friends. In his final months Darwin was tended by Emma, who had stood by him despite their differences in religious belief. Yet his followers, including the indomitable Huxley, had grander plans. He was buried at Westminster Abbey. A man who dares to waste one hour of time has not discovered the value of life.

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## Chapter 4 : Selected Letters On Evolution And Origin Of Species - E-book - Kitap - TNC-TR

*This book provides a behind-the-scenes look at one of the most powerful and revolutionary ideas in world history -- the theory of evolution. Subsequent chapters trace the scientist's steady accumulation of facts; the writing, publication, and defense of his landmark publication, *On the Origin of Species*; the spread of the doctrine of evolution; and the writing and publication of other works.*

General overview The evidence for evolution Darwin and other 19th-century biologists found compelling evidence for biological evolution in the comparative study of living organisms, in their geographic distribution, and in the fossil remains of extinct organisms. The amount of information about evolutionary history stored in the DNA and proteins of living things is virtually unlimited; scientists can reconstruct any detail of the evolutionary history of life by investing sufficient time and laboratory resources. The following sections identify the most productive of these sources and illustrate the types of information they have provided. The fossil record Paleontologists have recovered and studied the fossil remains of many thousands of organisms that lived in the past. This fossil record shows that many kinds of extinct organisms were very different in form from any now living. It also shows successions of organisms through time see faunal succession, law of ; geochronology: Determining the relationships of fossils with rock strata , manifesting their transition from one form to another. When an organism dies, it is usually destroyed by other forms of life and by weathering processes. On rare occasions some body parts—particularly hard ones such as shells, teeth, or bones—are preserved by being buried in mud or protected in some other way from predators and weather. Eventually, they may become petrified and preserved indefinitely with the rocks in which they are embedded. Methods such as radiometric dating —measuring the amounts of natural radioactive atoms that remain in certain minerals to determine the elapsed time since they were constituted—make it possible to estimate the time period when the rocks, and the fossils associated with them, were formed. Radiometric dating indicates that Earth was formed about 4. The earliest fossils resemble microorganisms such as bacteria and cyanobacteria blue-green algae ; the oldest of these fossils appear in rocks 3. The oldest known animal fossils, about million years old, come from the so-called Ediacara fauna , small wormlike creatures with soft bodies. Numerous fossils belonging to many living phyla and exhibiting mineralized skeletons appear in rocks about million years old. These organisms are different from organisms living now and from those living at intervening times. Some are so radically different that paleontologists have created new phyla in order to classify them. The first vertebrate s, animals with backbones, appeared about million years ago; the first mammal s, less than million years ago. The history of life recorded by fossils presents compelling evidence of evolution. The fossil record is incomplete. Of the small proportion of organisms preserved as fossils, only a tiny fraction have been recovered and studied by paleontologists. In some cases the succession of forms over time has been reconstructed in detail. One example is the evolution of the horse. The horse can be traced to an animal the size of a dog having several toes on each foot and teeth appropriate for browsing; this animal, called the dawn horse genus *Hyracotherium* , lived more than 50 million years ago. The most recent form, the modern horse *Equus* , is much larger in size, is one-toed, and has teeth appropriate for grazing. The transitional forms are well preserved as fossils, as are many other kinds of extinct horses that evolved in different directions and left no living descendants. Numbered bones in the forefoot illustrations trace the gradual transition from a four-toed to a one-toed animal. Using recovered fossils, paleontologists have reconstructed examples of radical evolutionary transitions in form and function. For example, the lower jaw of reptiles contains several bones, but that of mammals only one. The other bones in the reptile jaw unmistakably evolved into bones now found in the mammalian ear. At first, such a transition would seem unlikely—it is hard to imagine what function such bones could have had during their intermediate stages. Yet paleontologists discovered two transitional forms of mammal-like reptiles, called therapsid s, that had a double jaw joint i. Not one but many creatures intermediate between living apes and humans have since been found as fossils. The

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oldest known fossil hominin is Ardipithecus lived about 4 million years ago. Numerous fossil remains from diverse African origins are known of Australopithecus, a hominin that appeared between 3 million and 4 million years ago. Australopithecus had an upright human stance but a cranial capacity of less than 500 cc equivalent to a brain weight of about 400 grams, comparable to that of a gorilla or a chimpanzee and about one-third that of humans. Its head displayed a mixture of ape and human characteristics—a low forehead and a long, apelike face but with teeth proportioned like those of humans. Other early hominins partly contemporaneous with Australopithecus include Kenyanthropus and Paranthropus; both had comparatively small brains, although some species of Paranthropus had larger bodies. Paranthropus represents a side branch in the hominin lineage that became extinct. Along with increased cranial capacity, other human characteristics have been found in Homo habilis, which lived about 2 million years ago. The brain sizes of H. habilis and H. ergaster, which lived about 1 million years ago, are about 600–800 cc. All but Homo sapiens, the species that comprises modern humans, are extinct and have been reconstructed from fossil evidence. Structural similarities The skeletons of turtles, horses, humans, birds, and bats are strikingly similar, in spite of the different ways of life of these animals and the diversity of their environments. The correspondence, bone by bone, can easily be seen not only in the limbs but also in every other part of the body. From a purely practical point of view, it is incomprehensible that a turtle should swim, a horse run, a person write, and a bird or a bat fly with forelimb structures built of the same bones. An engineer could design better limbs in each case. But if it is accepted that all of these skeletons inherited their structures from a common ancestor and became modified only as they adapted to different ways of life, the similarity of their structures makes sense. Homologies of the forelimb among vertebrates, giving evidence for evolution. The bones correspond, although they are adapted to the specific mode of life of the animal. Comparative anatomy investigates the homologies, or inherited similarities, among organisms in bone structure and in other parts of the body. The correspondence of structures is typically very close among some organisms—the different varieties of songbirds, for instance—but becomes less so as the organisms being compared are less closely related in their evolutionary history. The similarities are less between mammals and birds than they are among mammals, and they are still less between mammals and fishes. Similarities in structure, therefore, not only manifest evolution but also help to reconstruct the phylogeny, or evolutionary history, of organisms. Comparative anatomy also reveals why most organismic structures are not perfect. The imperfection of structures is evidence for evolution and against antievolutionist arguments that invoke intelligent design see below Intelligent design and its critics. Embryonic development and vestiges Darwin and his followers found support for evolution in the study of embryology, the science that investigates the development of organisms from fertilized egg to time of birth or hatching. Vertebrates, from fishes through lizards to humans, develop in ways that are remarkably similar during early stages, but they become more and more differentiated as the embryos approach maturity. The similarities persist longer between organisms that are more closely related. Common developmental patterns reflect evolutionary kinship. Lizards and humans share a developmental pattern inherited from their remote common ancestor; the inherited pattern of each was modified only as the separate descendant lineages evolved in different directions. The common embryonic stages of the two creatures reflect the constraints imposed by this common inheritance, which prevents changes that have not been necessitated by their diverging environments and ways of life. The embryos of humans and other nonaquatic vertebrates exhibit gill slits even though they never breathe through gills. These slits are found in the embryos of all vertebrates because they share as common ancestors the fish in which these structures first evolved. Human embryos also exhibit by the fourth week of development a well-defined tail, which reaches maximum length at six weeks. Similar embryonic tails are found in other mammals, such as dogs, horses, and monkeys; in humans, however, the tail eventually shortens, persisting only as a rudiment in the adult coccyx. A close evolutionary relationship between organisms that appear drastically different as adults can sometimes be recognized by their embryonic homologies. Barnacles, for example, are sedentary crustaceans with little apparent likeness to such free-swimming crustaceans as lobsters, shrimps, or copepods. Yet barnacles pass through a free-swimming larval stage, the nauplius, which is unmistakably similar to that of other crustacean

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larvae. Embryonic rudiments that never fully develop, such as the gill slits in humans, are common in all sorts of animals. Some, however, like the tail rudiment in humans, persist as adult vestiges, reflecting evolutionary ancestry. The most familiar rudimentary organ in humans is the vermiform appendix. This wormlike structure attaches to a short section of intestine called the cecum, which is located at the point where the large and small intestines join. The human vermiform appendix is a functionless vestige of a fully developed organ present in other mammals, such as the rabbit and other herbivores, where a large cecum and appendix store vegetable cellulose to enable its digestion with the help of bacteria. Vestiges are instances of imperfections—like the imperfections seen in anatomical structures—that argue against creation by design but are fully understandable as a result of evolution. Biogeography Darwin also saw a confirmation of evolution in the geographic distribution of plants and animals, and later knowledge has reinforced his observations. For example, there are about 1, known species of *Drosophila* vinegar flies in the world; nearly one-third of them live in Hawaii and nowhere else, although the total area of the archipelago is less than one-twentieth the area of California or Germany. Also in Hawaii are more than 1, species of snails and other land mollusks that exist nowhere else. This unusual diversity is easily explained by evolution. The islands of Hawaii are extremely isolated and have had few colonizers—i. Those species that did colonize the islands found many unoccupied ecological niches, local environments suited to sustaining them and lacking predators that would prevent them from multiplying. In response, these species rapidly diversified; this process of diversifying in order to fill ecological niches is called adaptive radiation. In Africa are rhinoceroses, hippopotamuses, lions, hyenas, giraffes, zebras, lemurs, monkeys with narrow noses and nonprehensile tails, chimpanzees, and gorillas. South America, which extends over much the same latitudes as Africa, has none of these animals; it instead has pumas, jaguars, tapir, llamas, raccoons, opossums, armadillos, and monkeys with broad noses and large prehensile tails. These vagaries of biogeography are not due solely to the suitability of the different environments. There is no reason to believe that South American animals are not well suited to living in Africa or those of Africa to living in South America. The islands of Hawaii are no better suited than other Pacific islands for vinegar flies, nor are they less hospitable than other parts of the world for many absent organisms. In fact, although no large mammals are native to the Hawaiian islands, pigs and goats have multiplied there as wild animals since being introduced by humans. This absence of many species from a hospitable environment in which an extraordinary variety of other species flourish can be explained by the theory of evolution, which holds that species can exist and evolve only in geographic areas that were colonized by their ancestors. Molecular biology The field of molecular biology provides the most detailed and convincing evidence available for biological evolution. This has made it possible to reconstruct evolutionary events that were previously unknown and to confirm and adjust the view of events already known. The precision with which these events can be reconstructed is one reason the evidence from molecular biology is so compelling. Another reason is that molecular evolution has shown all living organisms, from bacteria to humans, to be related by descent from common ancestors. A remarkable uniformity exists in the molecular components of organisms—in the nature of the components as well as in the ways in which they are assembled and used. In all bacteria, plants, animals, and humans, the DNA comprises a different sequence of the same four component nucleotides, and all the various proteins are synthesized from different combinations and sequences of the same 20 amino acids, although several hundred other amino acids do exist. The genetic code by which the information contained in the DNA of the cell nucleus is passed on to proteins is virtually everywhere the same. Similar metabolic pathways—sequences of biochemical reactions—see metabolism—are used by the most diverse organisms to produce energy and to make up the cell components. This unity reveals the genetic continuity and common ancestry of all organisms.

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## Chapter 5 : Selected Letters of Charles Darwin (Frederick Burkhardt)

*This book provides a behind-the-scenes look at one of the most powerful and revolutionary ideas in world history -- the theory of evolution. It traces the development of this momentous concept through the autobiography, letters, and notebook excerpts of the man who conceived the theory and introduced it to the world.*

The first edition also has a full bibliographic description in H. Horblit One hundred books famous in science, , Grolier Club. Peckham considers all editions and issues published in England of which he was aware, from the first of up to the thirty-ninth thousand of The bibliography is an adjunct to the variorum text which shows the great changes which Darwin made to the five editions which follow the first. These are not surprising in view of the great difficulties involved, even in England, of sighting copies of all of the many issues. He refers to the thirteenth thousand of , but the same issue occurs with an earlier title page. He describes the fifteenth thousand of and the twentieth of , both of which he had seen, as being identical in format with the thirteenth of Whereas the latter is an octavo in eights, the former two, as well as the eighteenth of , are octavos in twelves. All the issues are listed in the printing of , and all that I have seen do contain the summary of differences. Indeed I have never seen a Murray Darwin without it after , when it first appeared. He also states that issues after are printed from the stereotypes of the two volume Library Edition repaginated. His statement on page [] that in the later issues, from the thirty-fifth thousand of , the thousands given on the title pages are correct is not true because he has ignored the two volume Library Edition of which is the thirty-third thousand. Finally, he considers only the editions and issues printed in England. Darwin was extremely keen that his ideas should be disseminated as widely as possible by translation, and that the changes in these ideas should also reach foreign editions. To this end, he corresponded with translators and with publishers. Certainly, the fourth American printing of and the first Spanish of contain matter not present in any English printing. The early German and French editions also need examination. Although Peckham describes and illustrates the bindings, he does not seem to have seen enough copies to notice even striking variations in them. Darwin had intended to write a much larger work on transmutation and had made considerable progress towards it when he received, on June 18th , the letter from Wallace which led to the publication of their joint paper in August. He started work on the book on Tuesday July 20th, , whilst on holiday at Sandown in the Isle of Wight. The details of its composition and publishing are given in Life and letters Vol. To begin with, he expected it to be an abstract of perhaps as little as thirty pages, published in the Journal of the Linnean Society, but by the winter it was clear that it would have to be a book. In March Lyell mentioned it to John Murray who accepted it in April, after seeing the first three chapters. It was all, except the index, in corrected proof by September 11th. Darwin was still calling it an abstract up until the end of March, and he roughed out a title page which Lyell showed to Murray. This is printed in Life and letters Vol. Murray thought it too long. Darwin received a copy early in November; Peckham says that Murray sent it on Wednesday 2nd. The overseas presentation copies were sent out before Friday 11th, and the home ones must have gone out at about the same time because he received a letter of thanks from Sir John Lubbock on Tuesday 15th, or earlier. As Darwin took at least another twenty for presentation, the final number available for the trade was about 1, These facts are at variance with the often-printed statement that all the 1, copies were sold to the public on publication day, Thursday 24th; indeed once copies had reached the bookshops, up and down the country, how could anyone know whether they were sold or not. The first edition was published on November 24th, and all copies sold first day. There are, however, small differences in the cases and in the inserted advertisements; these points have been considered in detail in The Book collector, Vol. The presence of two quotations only, from Whewell and Bacon, on the verso of the half-title leaf p. Indeed the whale-bear story in full is not peculiar to the first edition, but occurs in all the four American printings of The single folded lithographic diagram , by William West, is inserted facing page Gingerich has used it recently in a discussion of the speed and pattern of evolution at a species level Amer. The book is signed and sewn in twelves and is often described as a duodecimo. In the bolts the

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folded half sheet is inserted in the middle of the folded sheet; the first and second leaves are signed A1, A2 etc. The identification of original variants of the case is bedevilled by the habit of transferring the text of copies in original, but worn, cases into better cases taken off copies of the second or third editions, which are closely similar. However, examination of copies with impeccable antecedents has shown two variants. These are described under No. The copy gave no indication of being sophisticated and was probably a freak. The general list occurs in three forms: The other anomalies in the Admiralty list, that is the repetition of number 17, and the number 22 coming before 21, are the same in all issues. This situation would seem to suggest that the advertisements were printed from standing type at least three times, in the order given. This would have been quite normal practice for a book which was to have an official publication date early in the new year, nevertheless there are two copies known which are dated on the title page. The existence of such copies has long been known to the trade, although, from their extreme rarity, few booksellers can ever have seen one. Wood An introduction to the literature of vertebrate zoology, , claimed that McGill University held them both. It does not and never did. The book-sellers were, in a purist sense, right; the new printing was from standing type of the first edition, although with a considerable number of resettings. Darwin himself considered that it was merely corrected, but the next printing, in , was called the third edition on the title page. The copy at Yale is in poor condition and that at the University of Southern California bad, but both are in the original cases which are identical with one of the variants of the cases of and neither has any inserted advertisements. A third copy, in commerce in America, was brought to my notice in March This one was in excellent condition and had inserted advertisements dated June , in the third variant referred to above. The case was precisely the same as those of the other two. There are three quotations on the verso of the half-title leaf. This story is not found again in any printing, except in the American editions of , until the end of copyright. It is to be found reprinted in full, however in James Lamont Seasons with the sea-horses, , as part of an essay on the origin of marine mammals pp. The cases are closely similar to those of the first edition, but three minor variants occur. These are entered here under No. The price fell to 14s. The third edition appeared in April , 2, copies being printed. The case is the same as that of the two previous editions, but again differing in small details. It was extensively altered, and is of interest for the addition of a table of differences between it and the second edition, a table which occurs in each subsequent edition, and also for the addition of the historical sketch. This sketch, which was written to satisfy complaints that Darwin had not sufficiently considered his predecessors in the general theory of evolution, had already appeared in a shorter form in the first German edition , as well as in the fourth American printing where it is called a preface; both of these appeared in Asa Gray wrote to Darwin on Feb. There is also a postscript on page xii. This concerns a review of the earlier editions by Asa Gray which had appeared in the Atlantic Monthly in , and as a pamphlet paid for by Darwin, in This edition has one leaf of advertisements which is part of the book 2A6. The fourth edition of was of 1, copies. It was again extensively altered, and it is in this one that the date of the first edition, as given on the verso of the half title, is corrected from October 1st to November 24th. There are two minor variations of this case; the earlier has the inserted advertisements dated January and the later dated April The fifth edition of was of 2, copies and was again much revised. It remains thus until the thirty-ninth thousand of , but in the forty-first of , which was reset, Francis Darwin altered the first to Dalton, so that there were then two mistakes. The format of this edition changes to octavo in eights; the cases, of which there are four conspicuous variants, are entirely new, and the spine title is reduced to Origin of species. Inserted advertisements, dated September , are usually present. The sixth edition , which is usually regarded as the last, appeared in February It is again extensively revised and contains a new chapter, VII. The edition was aimed at a wider public and printed in smaller type, the volume shorter again and giving the general impression of a cheap edition, which at 7s. The title changes to The origin of species, and a glossary , compiled by W. It had been used in the first edition of The descent of man in the previous year, but not before in this work. The word had however been used in its transformist sense by Lyell as early as Principles of geology, Vol. In this edition it occurs twice on page and three times on page The last sentence of the third paragraph of Chapter XIV p. Both forms are found in editions in print

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today. This continues unnoticed through seventeen printings from the same stereotypes; but it was corrected when the whole book was reset for the forty-first thousand of This edition was reprinted, from stereotypes, later in the same year as the thirteenth thousand, and, again as the thirteenth, in The addition is the Expression of the emotions in its tenth thousand of As the first edition of the Expression of the emotions came out in November , the first issue of the thirteenth thousand must have been in press before this time, or else the new book would have been added. The issue has no inserted advertisements, but copies of may have them dated April The printing of is the final text as Darwin left it. Peckham drew attention to the little known fact that there are small differences between the text of and that of He knew that the printings of and were from unaltered stereotypes of , but was unable to see a copy of and had therefore to leave it uncertain whether these differences occur for the first time in that printing or in that of which he used for collation. The issue was of 1, copies only. This number is as small as any, being equalled only by that of the first edition; and, whilst the latter has been carefully conserved in libraries, no attention seems to have been paid to this one. It does not seem to have been previously recognized as the first printing of the final text, and is remarkably hard to come by. It was, incidentally, this edition which Samuel Butler had beside him when writing Evolution old and new in This printing is the eighteenth thousand, but, as it is important to know what was the first issue of the final text, it should be noticed that advertisements for The origin of species in other works by Darwin around mention the existence of both sixteenth and seventeenth thousands as well as this one.

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## Chapter 6 : Selected Letters on Evolution and Origin of Species by Charles Darwin

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He was the grandson of two prominent abolitionists: Painting of seven-year-old Charles Darwin in Both families were largely Unitarian , though the Wedgwoods were adopting Anglicanism. The eight-year-old Charles already had a taste for natural history and collecting when he joined the day school run by its preacher in That July, his mother died. From September , he joined his older brother Erasmus attending the nearby Anglican Shrewsbury School as a boarder. Darwin found lectures dull and surgery distressing, so he neglected his studies. He learned taxidermy in around 40 daily hour-long sessions from John Edmonstone , a freed black slave who had accompanied Charles Waterton in the South American rainforest. He learned the classification of plants, and assisted with work on the collections of the University Museum , one of the largest museums in Europe at the time. As Darwin was unqualified for the Tripos , he joined the ordinary degree course in January He became a close friend and follower of botany professor John Stevens Henslow and met other leading parson-naturalists who saw scientific work as religious natural theology , becoming known to these dons as "the man who walks with Henslow". In his final examination in January Darwin did well, coming tenth out of candidates for the ordinary degree. Inspired with "a burning zeal" to contribute, Darwin planned to visit Tenerife with some classmates after graduation to study natural history in the tropics. The ship was to leave in four weeks on an expedition to chart the coastline of South America. As FitzRoy had intended, Darwin spent most of that time on land investigating geology and making natural history collections, while HMS Beagle surveyed and charted coasts. Most of his zoology notes are about marine invertebrates, starting with plankton collected in a calm spell. He identified the little-known Megatherium by a tooth and its association with bony armour, which had at first seemed to him to be like a giant version of the armour on local armadillos. The finds brought great interest when they reached England. Three Fuegians on board had been seized during the first Beagle voyage , then during a year in England were educated as missionaries. Darwin found them friendly and civilised, yet at Tierra del Fuego he met "miserable, degraded savages", as different as wild from domesticated animals. Unlike his scientist friends, he now thought there was no unbridgeable gap between humans and animals. The Fuegian they had named Jemmy Button lived like the other natives, had a wife, and had no wish to return to England. High in the Andes he saw seashells, and several fossil trees that had grown on a sand beach. He theorised that as the land rose, oceanic islands sank, and coral reefs round them grew to form atolls. He heard that slight variations in the shape of tortoise shells showed which island they came from, but failed to collect them, even after eating tortoises taken on board as food. Zoologists had a huge backlog of work, and there was a danger of specimens just being left in storage. The armour fragments were actually from Glyptodon , a huge armadillo-like creature as Darwin had initially thought. On the same day, he presented his mammal and bird specimens to the Zoological Society. The ornithologist John Gould soon announced that the Galapagos birds that Darwin had thought a mixture of blackbirds , " gros-beaks " and finches , were, in fact, twelve separate species of finches. Darwin stayed with his freethinking brother Erasmus , part of this Whig circle and a close friend of the writer Harriet Martineau , who promoted Malthusianism underlying the controversial Whig Poor Law reforms to stop welfare from causing overpopulation and more poverty. As a Unitarian, she welcomed the radical implications of transmutation of species , promoted by Grant and younger surgeons influenced by Geoffroy. Darwin had not labelled the finches by island, but from the notes of others on the ship, including FitzRoy, he allocated species to islands. By mid-March, Darwin was speculating in his Red Notebook on the possibility that "one species does change into another" to explain the geographical distribution of living species such as the rheas, and extinct ones such as the strange Macrauchenia , which resembled a giant guanaco. On 20 September he had "an uncomfortable palpitation of the heart", so his

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doctors urged him to "knock off all work" and live in the country for a few weeks. After visiting Shrewsbury he joined his Wedgwood relatives at Maer Hall, Staffordshire, but found them too eager for tales of his travels to give him much rest. His charming, intelligent, and cultured cousin Emma Wedgwood, nine months older than Darwin, was nursing his invalid aunt. After initially declining the work, he accepted the post in March. The strain took a toll, and by June he was being laid up for days on end with stomach problems, headaches and heart symptoms. For the rest of his life, he was repeatedly incapacitated with episodes of stomach pains, vomiting, severe boils, palpitations, trembling and other symptoms, particularly during times of stress, such as attending meetings or making social visits. He visited Glen Roy in glorious weather to see the parallel "roads" cut into the hillsides at three heights. He later published his view that these were marine raised beaches, but then had to accept that they were shorelines of a proglacial lake. Used to jotting down daily notes on animal breeding, he scrawled rambling thoughts about career and prospects on two scraps of paper, one with columns headed "Marry" and "Not Marry". Advantages included "constant companion and a friend in old age. As species always breed beyond available resources, favourable variations would make organisms better at surviving and passing the variations on to their offspring, while unfavourable variations would be lost. In October, that is, fifteen months after I had begun my systematic enquiry, I happened to read for amusement Malthus on Population, and being well prepared to appreciate the struggle for existence which everywhere goes on from long-continued observation of the habits of animals and plants, it at once struck me that under these circumstances favourable variations would tend to be preserved, and unfavourable ones to be destroyed. The result of this would be the formation of new species. Here, then, I had at last got a theory by which to work. She accepted, then in exchanges of loving letters she showed how she valued his openness in sharing their differences, also expressing her strong Unitarian beliefs and concerns that his honest doubts might separate them in the afterlife. I shall be delighted to hear how you think that this change may have taken place, as no presently conceived opinions satisfy me on the subject. Darwin scorned its amateurish geology and zoology, but carefully reviewed his own arguments. Controversy erupted, and it continued to sell well despite contemptuous dismissal by scientists. He now renewed a fascination and expertise in marine invertebrates, dating back to his student days with Grant, by dissecting and classifying the barnacles he had collected on the voyage, enjoying observing beautiful structures and thinking about comparisons with allied structures. He wrote to Hooker about this portrait, "if I really have as bad an expression, as my photograph gives me, how I can have one single friend is surprising. Hooker increasingly doubted the traditional view that species were fixed, but their young friend Thomas Henry Huxley was firmly against the transmutation of species. Though Darwin saw no threat, on 14 May he began writing a short paper. Finding answers to difficult questions held him up repeatedly, and he expanded his plans to a "big book on species" titled Natural Selection, which was to include his "note on Man". He continued his researches, obtaining information and specimens from naturalists worldwide including Wallace who was working in Borneo. In mid he added a section heading; "Theory applied to Races of Man", but did not add text on this topic. On 5 September, Darwin sent the American botanist Asa Gray a detailed outline of his ideas, including an abstract of Natural Selection, which omitted human origins and sexual selection. In December, Darwin received a letter from Wallace asking if the book would examine human origins. Shocked that he had been "forestalled", Darwin sent it on that day to Lyell, as requested by Wallace, [] [] and although Wallace had not asked for publication, Darwin suggested he would send it to any journal that Wallace chose. His family was in crisis with children in the village dying of scarlet fever, and he put matters in the hands of his friends. Lyell arranged to have it published by John Murray. As many more individuals of each species are born than can possibly survive; and as, consequently, there is a frequently recurring struggle for existence, it follows that any being, if it vary however slightly in any manner profitable to itself, under the complex and sometimes varying conditions of life, will have a better chance of surviving, and thus be naturally selected. From the strong principle of inheritance, any selected variety will tend to propagate its new and modified form. There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone

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cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved. An caricature following publication of The Descent of Man was typical of many showing Darwin with an ape body, identifying him in popular culture as the leading author of evolutionary theory. Reaction to On the Origin of Species The book aroused international interest, with less controversy than had greeted the popular Vestiges of the Natural History of Creation. Patrick Matthew drew attention to his book which had a brief appendix suggesting a concept of natural selection leading to new species, but he had not developed the idea.

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