= Philosophie Zoologique =

Philosophie Zoologique (" Zoological Philosophy : Exposition with Regard to the Natural History of Animals ") is an 1809 book by the French naturalist Jean @-@ Baptiste Lamarck , in which he outlines his pre @-@ Darwinian theory of evolution now known as Lamarckism .

In the book , Lamarck named two supposed laws that would enable animal species to acquire characteristics under the influence of their environment . The first law stated that use or disuse would cause body structures to grow or shrink over the generations . The second law asserted that such changes would be inherited . Those conditions together imply that species continuously change by adaptation to their environments , forming a branching series of evolutionary paths .

Lamarck was largely ignored by the major French zoologists , Buffon and Cuvier , but he attracted much more interest abroad . The book was read carefully , but its thesis rejected , by nineteenth century scientists including the geologist Charles Lyell and the comparative anatomist Thomas Henry Huxley . Darwin acknowledged Lamarck as an important zoologist , and his theory a forerunner of Darwin 's evolution by natural selection .

= = Context = =

Jean @-@ Baptiste Lamarck (1744 ? 1829) was a member of the French Academy of Sciences and a professor of botany at the Jardin des Plantes and then became the first professor of zoology at the new Muséum national d 'Histoire naturelle . He became known for his work on the taxonomy of the invertebrates , especially of molluscs . However , he is mainly remembered for the theory that now bears his name , Lamarckism , and in particular his view that the environment (called by Lamarck the conditions of life) gave rise to permanent , inherited , evolutionary changes in animals . He described his theory in his 1802 Recherches sur l 'organisation des corps vivants , and in his 1809 Philosophie Zoologique , and later in his Histoire naturelle des animaux sans vertèbres , (1815 ? 1822) .

= = Book = =

In the Philosophie Zoologique , Lamarck proposed that species could acquire new characteristics from influences in their environment , in two rules that he named as laws . His first law stated that use or disuse of a body 's structures would cause them to grow or shrink in the course of several generations . His second law held that any changes made in this way would be inherited . Together , Lamarck 's laws imply the steady adaptation of animals to their environments .

He gave names to a number of vestigial structures in the book , among them " Olivier 's Spalax , which lives underground like the mole , and is apparently exposed to daylight even less than the mole , has altogether lost the use of sight : so that it shows nothing more than vestiges of this organ . "

Lamarck described speciation as follows :

" as new modifications will necessarily continue to operate , however slowly , not only will there continually be found new species , new genera , and new orders , but each species will vary in some part of its structure and form ... individuals which from special causes are transported into very different situations from those where the others occur , and then constantly submitted to other influences - the former , I say , assume new forms , and then they constitute a new species . "

He argued that gaps between differing kinds of animals resulted from the extinction of intermediate forms :

Species form " a branching series , irregularly graduated which has no discontinuity in its parts , or which , at least , if its true that there are some because of lost species , has not always had such . It follows that the species that terminate each branch of the general series are related , at least on one side , to the other neighboring species that shade into them " .

Lamarck proposed the transmutation of species (" transformisme ") , but did not believe that all living things shared a common ancestor . Rather he believed that simple forms of life were created

continuously by spontaneous generation . He also believed that an innate life force , which he sometimes described as a nervous fluid , drove species to become more complex over time , advancing up a linear ladder of complexity similar to the mediaeval great chain of being .

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= = Reception = =

Lamarck 's evolutionary theory made little immediate impact on his fellow zoologists , or on the public at the time . The historian of science Richard Burkhardt argues that this was because Lamarck was convinced his views would be poorly received , and made little effort to present his theory persuasively .

In the French @-@ speaking world in his lifetime , Lamarck and his theories were rejected by the major zoologists of the day , Buffon and Cuvier . However , he made more of an impact outside France and after his death , where leading scientists such as Ernst Haeckel , Charles Lyell and Darwin himself recognised him as a major zoologist , with theories that presaged Darwinian evolution .

In 1830 ? 1833 , Charles Lyell , in his Principles of Geology , carefully summarised Lamarck 's theory (in about 6 pages , with cross @-@ references to the Philosophie Zoologique) and then roundly criticised it . Lyell begins by noting that Lamarck gives no examples at all of the development of any entirely new function (" the substitution of some entirely new sense , faculty , or organ ") but only proves that the " dimensions and strength " of some parts can be increased or decreased . Lyell says that with this " disregard to the strict rules of induction " Lamarck " resorts to fictions " . Lyell goes on , assuming for the sake of argument that Lamarck was right about the creation of new organs , that Lamarck 's theory would mean that instead of the nature and form of an animal giving rise to its behaviour , its behaviour would determine

the form of its body , the number and condition of its organs , in short , the faculties which it enjoys . Thus otters , beavers , waterfowl , turtles , and frogs , were not made web @-@ footed in order that they might swim ; but their wants having attracted them to the water in search of prey , they stretched out the toes of their feet to strike the water and move rapidly along its surface . By the repeated stretching of their toes , the skin which united them at the base , acquired a habit of extension , until , in the course of time , the broad membranes which now connect their extremities were formed .

Lyell similarly criticises the way Lamarck supposed the antelope and gazelle acquired " light agile forms " able to run swiftly ; or the " camelopard " (giraffe) became " gifted with a long flexible neck " .

Lamarckism was popularised in the English @-@ speaking world by the speculative Vestiges of the Natural History of Creation , published anonymously by Robert Chambers in 1844 .

In 1887 Thomas Henry Huxley , the comparative anatomist known as " Darwin 's Bulldog " for his energetic advocacy of Darwinian evolution , wrote that

With respect to the Philosophie Zoologique , it is no reproach to Lamarck to say that the discussion of the Species question in that work , whatever might be said for it in 1809 , was miserably below the level of the knowledge of half a century later . In that interval of time the elucidation of the structure of the lower animals and plants had given rise to wholly new conceptions of their relations ; histology and embryology , in the modern sense , had been created ; physiology had been reconstituted ; the facts of distribution , geological and geographical , had been prodigiously multiplied and reduced to order . To any biologist whose studies had carried him beyond mere species @-@ mongering in 1850 , one @-@ half of Lamarck 's arguments were obsolete and the other half erroneous , or defective , in virtue of omitting to deal with the various classes of evidence which had been brought to light since his time . Moreover his one suggestion as to the cause of the gradual modification of species ? effort excited by change of conditions ? was , on the face of it , inapplicable to the whole vegetable world . I do not think that any impartial judge who reads the Philosophie Zoologique now , and who afterwards takes up Lyell 's trenchant and effectual criticism (published as far back as 1830) , will be disposed to allot to Lamarck a much higher place in the establishment of biological

evolution than that which Bacon assigns to himself in relation to physical science generally , ? buccinator tantum .

= = Versions = =

Lamarck : Contents
1809 , vol . I : (Oxford)
1830 , vol . I : (Harvard)
1830 , vol . I : (Michigan)
1830 , vol . II : (Michigan)