4 main theories of evolution pdf

Lamarcism: evidence in favor of Lamarcism (giraffe neck), criticism of Lamarism; Darwinism: the basic tenets of Darwinism, the shortcomings of Darwinism, neo-Darwinism; Variations: causes of variations, individual examples of natural selection (resistance of DDT in mosquitoes, malaria in relation to G-6-P-D deficiency and sickle cell anemia); Artificial selection; adaptation (lederberg experiment on replica cladding). Experiment on cladding of Lederberg replica with Darwinian interpretation, the mechanism of forming, the definition of the gene pool; bqtheoriesoforgevo.docFile Size: 36 kbFile Type: docDownload file based on evidence of evolution of various theories have been put forward regarding the evolution of life. How organisms changed and new species evolved. There were a number of theories put forward for this, however the most important are theories postulated by Lamarck and Darwin. Changes in the structure or function of any organ acquired during human life in response to changes in the environment are inherited by offspring and continue to be added over a period of time. These changes lead to the emergence of new species. This was given by JEAN LAMARCK as the theory of acquired characters. LAMARKS POSTULATES:1.New needs: There are changes occurring in the environment that create new needs, they allow them to better adapt to a changed environment. These efforts lead to a change in habits or behaviors. 2. Acquisition of new characters or organs: new characters can be acquired in two ways - through the use and lack of authority. Continuous use or non-failure to use the organ can lead to the organs being functional and efficient, or to a gradual reduction in size and disappearance. Examples of such structures are rudimentary organs. The impact of the environment. Changes in temperature, light, environment, food, etc. affect the functioning and behavior of organisms. These changes in function and behavior changes lead to the development of new characters. 3.Legacy of acquired symbols. Characters acquired by the body are inherited from the next generation. Thus, in each generation new symbols are added and the view changes to a new one. 1.The evolution of the long neck in Giraffe.According to Lamarck, giraffes evolved from deer as ancestors. These organisms had a short neck and limbs and grazed on the grass. As the climatic conditions changed, the rich vegetation changed into several trees. The leaves of these trees were the only food source for these giraffes. The giraffe's ancestors had to stretch their necks to get leaves in the trees. This gradual stretching of the neck leads to an increase in the neck and limbs. This was then passed on to the next generation and thus the giraffes have long necks and legs. They have developed a fast running power to protect themselves from enemies. gradually there was lengthening of limbs and average digits with a decrease in other numbers. 3.The evolution of snakes. According to Lamarque, the ancestors of snakes were limbed and looked like lizards. They lived in a dense jungle. For fear of mammals, these snakes began to crawl on the floor of the jungle and live in narrow crevices or burrows. For creeping among vegetation or burrowing into narrow crevices, they stretched their body, which gradually became elongated. The limbs were out of use and were a hindrance in creep and digging, thus gradually disappearing. 4.Webbed feet in aquatic birds. Aquatic birds, such as ducks, swans and geese, etc., originated in the terrestrial ancestor, developing a cobweb between the legs for marsh waters (adaptation to the water mode of continuous use of life). The web is designed because generic shapes had to spread their legs and stretch the skin between them to rest on reducing the water to the size of the wings due to their continuous insulust. 1. The tendency to increase size is observed in many forms, but evolution also shows a decrease in size. For example, in Angiosperms, trees are primitive in shape while shrubs, grasses and grasses have evolved later and are more advanced. In addition, people who constantly use the organ do not necessarily strengthen it, for example, people who are engaged in reading and writing and using their eyes more than others, often develop visual impairment. 2. Legacy of acquired symbols: For example, if a parent becomes blind or deaf or lame before producing offspring, they do not produce blind, deaf or lame offspring. The injuries and wounds of parents do not appear in posterity. Small legs in Chinese women, nose and ear piercings in Indian women are age-old customs, but they have no hereditary effect. The strong muscles of the wrestler are not inherited by his children. 3. Another serious critique was based on an experiment performed by AUGUST WEISMANN, it cut off the tails of rats for about 80 generations, but tailless descendants were never born.4.The theory of germ plasma - The Theory of Continuity of Germ Plasma proposed by Weisman (1892) and Mendel's laws of inheritance, to inflict a heavy blow on the theory of inheritance of Lamarka's characters. According to the theory of germ plasma, each organism has two types of cells: (a) germ cells that transmit their hereditary material to the next generation and are in gonads. (b) Somatic cells that form the body and do not pass their hereditary material to posterity. 1.CHARLES ROBERT DARWIN - the origin of species by natural selection. 2. The theory of natural selection was announced by Charles Darwin and Alfred Russell Wallace. 3.The theory was based on animals and plants in the Galapagos Islands, observation of the distribution of animals, analysis of data in the essays of the human population and controlled breeding and artificial selection in Animals. Interesting articleObeda? Big legs? Blame Darwin 1.Overproduction: All living creatures have an inherent tendency to produce offspring of a kind in large numbers to perpetuate their race. The number of their offspring is much greater than can be supported by a particular environment and may survive. For example: Paramecia is divided three times in 48 hours. If all its descendants survive and reproduce, in five years the mass of paramecia will be equal to ten thousand masses of the Earth. 2.There is limited food and space. Space in the universe remains constant. The final source of food for plants and animals also remains constant. Thus, the portability of the environment does not allow the population to grow indefinitely. Despite the huge reproductive potential of living creatures in the wild, the number of individuals of each species remains almost unchanged for a long period of time.3.According to Darwin, humans reproduce in geometric proportions, while the space and availability of food remain constant, so that there is intense competition and three times the struggle for existence. Struggle intra-specific, interspecies and environmental. (a) Intra-specific wrestling: It is a struggle between individuals of the same species. This is the most difficult form of struggle, as the needs of individuals of the same species are identical. Interspecies struggle: it is a struggle between individuals of different species. (c) Environmental Control: This struggle of living beings is associated with environmental changes such as heat, cold, drought, floods, storms, famine, light, food and shelter, etc. 4.Variations: Fighting for existence leads to competition between organisms. Thus, organisms adapt and differ from each other in shape, size, behaviuor, etc. Variation is the law of nature. This leads them to change according to the conditions of natural resource use and successful survival. 5.Natural selection and survival of the fittest. In accordance with the nature of Darwin chooses only those persons who have more favorable variations and are best adapted to the environment. Less fit and unsuitable organisms are left out of choice. This sorting of people with useful variations was called Darwin's natural selection and the survival of the fittest Wallace. Darwin explained the evolution of the long neck of the modem giraffe by the presence of a long neck and a short giraffe neck in the ancestral population. After climate change, resulting in the presence of trees and no meadows, the long-necked giraffe with a longer front part were more successful in reaching the soft leaves of the trees for feeding. Thus, natural selection is favored by more-necked offspring generation after generation. Choosing longer through a long series of generations has led to the evolution of such long-necked giraffe modems. 6.Inherit useful variations: individuals who have struggled for existence pass on their useful variations to offspring, which will also prove suitable. Thus, the descendants of the chosen person are born suitable for the environment. 7.Formation or origin of new species. Darwin proposed the emergence of new variations in each generation. These variations continue to accumulate after several generations, descendants become noticeably different formations of a new species. The origin of new species by gradually modifying the old species is called species formation. 1.Artificial selection: Through controlled breeding and selection over several generations, many new varieties of plants and new species, races or breeds of pets have been developed. New races of dogs, horses, pigeons, birds, sheep, pigs, goats, etc., have been developed by man through artificial selection. Thus, there is a close parallel between natural selection and artificial selection. 2.Mimicry and protective coloring: Mimicry and protective coloring, as seen on some animals can only be achieved by gradual changes occupying side by side as in the model and simulate occupying the same area. 3.Correlation between the position of nectarines in flowers and the length of the proboscis of pollinating insects: This relationship between two different organisms develops gradually and can be explained by natural selection. 1.Darwin was not clear about the sources of variations and mechanisms of natural selection. 2.Inheriting small variations: Darwin stated that small variations form the raw material for evolution. However, this can only happen in fully functional organs, for ex. the inheritance of the bird wing in its original stage when it was not any benefit to the organism could not be explained.3.The existence of rudimentary organs: According to Darwin, only beneficial organs are selected and inherited. Then the presence of rudimentary organs that do not function cannot be explained. 4.Overspecialization: Overspecialisation of certain structures like elephant horns and tusks is a hindrance to these organisms. This fact that these structures that have been a hindrance to the body are inherited cannot be explained. Darwin explained the survival of the fittest rather than the arrival of the fittest. lamarckian_darwinian2.swfFile Size: 613 kbFile Type: swfDownload File New species appear sudden hired changes. This theory was given by HUGO DE VRIES, Dutch botanist, director of the Botanical Garden Amsterdan.He observed different species of Primrose (Oenothera lamarckiana)From observation he postulated mutations theoryPostulatesNew species appear sudden changes called mutations. All organisms tend to mutate. Individuals showing mutations Mutants. Mutations are uncertain and can be beneficial or harmful. Different representatives of the same species may have. It can appear again and again from generation to generation. Evidence in favor of mutation theoryAppearane is a new variety from normal parents - short legs ancon sheep, hornless Hereford cattle, no hair cats and dogs. Without seeds, the variety of banana evidence against mutation theory explains the mmind, meaning the joint development of the mutation is slow. Evolution is gradual, but the mutation is dramatic. The significance of the De Vries mutation theory is essential for the evolution of mutations to introduce variations that are then selected by NatureMutations to provide the raw material on which natural selection can work neo-Darwinism, also called modern evolutionary synthesis, usually denotes the integration of the theory of evolution of Charles Darwin through natural selection, Gregor Mendel theory of genetics as the basis for biological inheritance. A major figure in the development of modern synthesis include Thomas Hunt MorganMODERN SYNTHETIC THEORY EVOLUTION (1) Neo-Darwin is a modification of Darwin's original theory to remove his short parishes. (2) Instead of continuous variations, mutations are thought to help form new species. (3) Variations accumulate in the gene pool, not in individuals. (4) Neo-Darwinism includes isolation as an important component of evolution. (5) Theory may explain the emergence of unchanging forms over millions of years. (6) Usually only these changes are passed on to the next generation, which affect germ cells or where somatic cells enable germ cells. Variation is a process in which closely related organisms differ from each other. No two faces are similar to each other, this is called a variation. CAUSES OF VARIATIONS 1.Environmental conditions or somatogenic variations : Changes in the expression of somatic cell genes, they are not inherited. 2.Changes in the gene model or herminal or blasogen variations: Changes in germ plasma or gamete chromosomes, they are intrusive. 1.MUTATIONS 2.RECOMBINATION 3.MIGRATION - Genetic drift, gene flow 4.HYBRIDISATION 5.SELECTION Sudden hereditary change in the genetic composition of the body, except for which there is a simple recombination of genes. This leads to the introduction of new genetic information into the population by changing the genes that are already present. All alleles for a particular trait arose as a result of mutations, and were preserved in the gene pool as a result of sexual reproduction. The gene pool is a complete set of unique alleles in the form or population. Recombination results due to sexual reproduction bringing about genetic diversity. Each person has a unique gene pool half donated from the mother and half from Mixing genes that occurs during sexual sexual the term genetic recombination. Recombination does not directly change the frequency of alleles, but the new member has a unique combination of genes. Thus, having unique characteristics are superior to others. The migration or movement of individuals from one place or region to another leads to the addition or subtraction of alleles from the local population. When the body leaves the population and enters another, it leads to the loss of genetic information from one population and strengthening to another. If the body contains rare alleles, it can significantly affect the frequency of alleles of both populations. Variations of gene frequencies in the population can occur by accident. In every generation, some people may, just by chance, leave behind a few descendants (and genes, of course!), than other people. The genes of the next generation will be the genes of happy individuals, not necessarily healthier or better individuals. It's genetic drift. Thus, genetic drift can contribute to the process of species formation. The flow of genes is the movement of alleles from one population to another as a result of interbreeding between representatives of two populations. The accidental introduction of new alleles into the recipient population and their removal from the donor population affects the frequency of alleles in both populations. This leads to an increase in genetic variations. Genetic Drift is a mixture of genes of two populations of species that are usually separate. This occurs when migrated or cross-breeding artificially. Selection is the process by which organisms better adapted to the environment survive and reproduce. These organisms then pass on their success characteristics to the next generation. When the population increases, there is limited space and food, this leads to competition. Organisms, better adapted to this competition, survive. Selection is a differential or in-guessing reproduction of successful genotypes. Differential reproduction: changes occur in favor of differential reproduction of genes. The gene pool of better-adapted individuals is naturally selected. Environmental limiting factors and population size work together to select pressures that can vary in intensity. Thus, the pressure of selection can be considered as a means of increasing or decreasing the spread of the allele in the gene pool, which can lead to evolutionary changes. Types of Choice: There are three different types of production results: Stabilization selection: eliminates extreme changes in favor of medium or normal phenotypes. Directional selection: Works in response to gradual changes in the environment. This results in selection in one direction in relation to one particular character. Destructive selection: favors both extremes, so two peaks are visible. 1.Industrial melanism: Peppered moths seen 1845 was a mottled gray (Biston betularia) that would easily blend with lichen-covered trees. After 1845, black colored moths were spotted. This variety was called Biston betularia carbonaria. In the next 50 years, the frequency of these black moths will increase significantly. This growth from 1% to almost 99% was seen in industrial areas. Because of the induction revolution, tree trunks were covered with soot from industry. This was a disadvantage for grey moths, which can now be easily spotted by predators, while black moths were camouflaged in soot-covered trees. This was noted primarily and developed by H.B.D. KETTLEWELL and E.B. FORD. At the same time, environmental factors played a key role in reducing the gray variety and increasing the black or melanic variety. PEPPERED STIMULATION OF MOTH 2. D.D.T resistant mosquitoes: DDT initially proved to be a very effective insecticide, but then it became ineffective. The explanation is given as follows- The original population had some DDT resistant variety. Because DDT is not sprayed, they have no additional advantages over DDT-sensitive mosquitoes. When DDT was sprayed, natural selection favored DDT-resistant mosquitoes. Gradually, the entire population became resistant to DDT type. 3. Malaria and PD G-6 deficiency: G-6 PD is a glucose-6-phosphate enzyme of dehydrogenase. Decomposes hydrogen into oxide, formed during metabolism. Deficiency of this enzyme is a congenital metabolic error controlled by a specific gene. When people with malaria are given primachin, it causes hemolysis because hydrogen per oxide does not decompose due to a shortage of PD G-6. RBC deformed and in such a distorted RBC the malaria parasite does not survive or reproduce. These people are thus resistant to malaria and are conducive to natural selection. Further readingglucose6sphatedehydrogenase 4. Sickle cell anemia and malaria: This is a genetic disease in tropical Africa, where malaria is widespread. in this disorder the normal HbA gene is replaced by HbS causing sickle cell anemia. The capacity of the oxygen carrying hb decreases. RBC become sickle-shaped causing severe hemolytic anemia. The malaria parasite cannot survive in the sickle-shaped form of RBC. Heterozygous individuals are able to cope with malaria. This type of gene is supported along with the normal gene because it has the value of survival in malaria-infected areas. Natural Selection Artificial Selection 1The choice excerted by nature Selection exreted by humans 2Process works in natural populationsProcess works in domestic populations 3It is a slow process that can take thousands of yearsThis fast process and shows immediate results. 4It is responsible for the biological diversityProssed new varieties from the starting generations Any which is beneficial to the body called ADAPTATION. These are adjustments occurring in a living organism by which they can fit a changing environment. Thus, adaptation can be defined as characteristics of living forms that develop over a period of time that allow them to survive and reproduce within a specific environment. The adaptation process includes three important forces, Mutation, Choice, Genetic Drift Choice of the best genotype - for example, Peppered moths JOSHUA LEDERBERG and ESTHER LEDERBERG bacteria grown in culture to produce multiple colonies. The bacteria were then grown on plates with an antibiotic such as penicillin. Most colonies could not survive, but those that survived were resistant to penicillin. Thus, this strain has acquired the ability to survive in new conditions. Experiment-1. Bacteria spread to a plate called the original plate. 2.They can grow into several different colonies 3.This arrangement of colonies stamped from the original plate to a new plate that contains the antibiotic penicillin. 4.Colonies X and Y on the stamp plate survive. They must carry mutations for penicillin resistance. 5. Lederbergs intended to answer the question whether colonies on the new plate of antibiotic resistance developed because they were exposed to penicillin? The answer is no: When the original plate is washed with penicillin, the same colonies (those in the position of X and Y) live, although these colonies on the original plate have never encountered penicillin before. Two possible explanations: 1.Lamarque's view is penicillin-induced changes that allow bacteria to grow in penicillin.2 The Darwin-original view of the culture had this variety and it was favoured thus only the candidate survived. Further reading-Lederberg'sexperiment Geographically localized group of individuals of the same kind at a certain time represents the population and the sum of all populations of the same form. The species is made up of individuals who have the same gene pool. Species or origin of new SPECIESSpecialization is the process of forming new species. The interbreeding of a population that is reproductively isolated from other similar but morphologically distinguishable populations is called a species. Mechanisms that reduce the likelihood of interbreeding in related species of living organisms are called isolating mechanisms. Geographical isolation (physical barriers) Geographical or spatial isolation is when the population of organisms disintegrates due to geography and then encounters different selection pressures. Ethological isolation (behavioral difference) Blue-footed boos with their foot rituals. An isolating mechanism in which two species do not mate due to differences in courtship behavior. Temporary isolation (different breeding season) Species multiply at different times of the day, different different or different years, and it can prevent them from mating. Former. Three tropical species of orchid genus Dendrobium each flower in one day; flowers open at dawn and howce after dark. Mechanical insulation (genitilia structure) snails that have different spirals are unable to mate due to a change in the structure of genesis. Other insulating mechanisms also include physiological isolation (gamers do not encounter a fuse) and genetic isolation (zigota is impossible, hybrid sterilien). All-patriotic are the ones that inhabit different areas, while the symphonic are the ones that occupy the same geographical area. All-patriotic species is usually manifested by the population of animals. More animationAllopatric speciation Allopatric and sympatric speciation Sympatric speciationAllopatric speciation 1This occurs in populations that occupy the same geographic area. This occurs in a population that occurs in different geographic areas 2It occurs sudden reproductive isolationIt occurs in different populations through a gradual accumulation of variations and mutations 3It is isolated ecologically, etiological or genetic isolationIt is isolated by geographical barriers 4Sympatical species is suddenAllopatric speciation is a gradual microEVOLUTION changes in the gene pool of the population over time that lead to relatively small changes in organisms in the population - changes that will not lead to new organisms being treated as different species. Examples of such micro-revolutionary changes may be a change in the color or size of the species. MACROEVOLUTION changes in organisms that are significant enough that, over time, new organisms will be seen as a whole new species. In other words, new organisms will not be able to mate with their ancestors if we can unite them. Together. 4 main theories of evolution pdf