

ÜDS

READING

for ÜDS

FEN BİLİMLERİ - 3



www.remzihoca.com

1- Role of Mass Extinction in Evolution

Historically biologists—most famous among them British naturalist Charles Darwin—assumed that extinction is the natural outcome of competition between newly evolved, adaptively superior species and their older, more primitive ancestors. These scientists believed that newer, more highly evolved species simply drove less well-adapted species to extinction. That is, historically, extinction was thought to result from evolution. It was also thought that this process happens in a slow and regular manner and occurs at different times in different groups of organisms.

In the case of background extinction, this holds true. An average of three species becomes extinct every million years, usually as a result of the forces of natural selection. When this happens, new species—differing only slightly from the organisms that disappeared—rise to take their places, creating evolutionary lineages of related species. The modern horse, for example, comes from a long evolutionary lineage of related, but now extinct, species. The earliest known horse had four toes on its front feet, three toes on its rear feet, and weighed just 36 kg (80 lb). About 45 million years ago, this horse became extinct. It was succeeded by other types of horses with slightly different characteristics, such as teeth better shaped for eating different plants, which made them better suited to their environments. This pattern of extinction and the ensuing rise of related species continued over the course of 55 million years, ultimately resulting in the modern horse and its relatives the zebras and asses.

In mass extinctions, entire groups of species—such as families, orders, and classes—die out, creating opportunities for the survivors to exploit new habitats. In their new niches, the survivors evolve new characteristics and habits and, consequently, develop into entirely new species. What this course of events means is that mass extinctions are not the result of the evolution of new species, but actually a cause of evolution. Fossils from periods of mass extinction indicate that most new species evolve after waves of extinction. Mass extinctions cause periodic spurts of evolutionary change that shake up the dynamics of life on Earth.

VOCABULARY

assume	:	varsaymak
extinction	:	yokolma
outcome	:	sonuç
competition	:	rekabet,yarışma
evolve	:	gelişmek
adaptive	:	uyan
superior	:	üstün
primitive	:	ilkel
ancestor	:	ata
species	:	türler
simply	:	sadece
adapt TO	:	uyum sağlamak
result from	:	-den kaynaklanmak
evolution	:	evrim.gelişme
regular	:	düzenli
manner	:	tarz,şekil,kalıp
occur	:	meydana gelmek
in the case of	:	durumunda
average	:	ortalama
as a result of	:	-in sonucu olarak
force	:	güç,zorlamak
slightly	:	biraz
disappear = Vanish	:	gözden kaybolmak
create	:	yaratmak
lineage	:	bağlantı
related	:	ilgili
weigh	:	tartmak ,ağırlığa,buyuta sahip olmak
succeed IN	:	başarmak
ensue	:	ardından gelmek
ultimately	:	nihayetinde
result in	:	ile sonuçlanmak
relative	:	akraba/nisbi
entire	:	tüm
such as	:	örneğin, gibi
die out	:	soyu tükenmek
opportunity	:	fırsat
survivor	:	hayatta kalan
exploit	:	çıkarmak, kullanmak
habitat	:	yaşam yeri
consequently	:	sonuç olarak
event	:	olay
mean	:	anlamına gelmek demek istemek
indicate that	:	işaret etmek
wave	:	dalga
spurt	:	fişkırmak
shake	:	sallamak

This is perhaps best demonstrated in the development of our own ancestors, the early mammals. Before the fall of the dinosaurs, which had dominated Earth for more than 150 million years, mammals were small, nocturnal, and secretive. They devoted much of their time and energy to evading meat-eating dinosaurs. With the extinction of dinosaurs, the remaining mammals moved into habitats and ecological niches previously dominated by the dinosaurs. Over the next 65 million years, those early mammals evolved into a wide variety of species, assuming many ecological roles and rising to dominate Earth as the dinosaurs had before them.

VOCABULARY

perhaps	:	belki
demonstrate	:	göstermek
development	:	gelişme
dominate	:	egemen olmak
evade	:	kaçmak, kaçınmak
remaining	:	arta kalan
previously	:	eskiden
variety	:	çeşitlilik

VOCABULARY

2- Indirect Collection of Solar Energy

People can make indirect use of solar energy that has been naturally collected. Earth's atmosphere, oceans, and plant life, for example, collect solar energy that people later extract to power technology.

The Sun's energy, acting on the oceans and atmosphere, produces winds that for centuries have turned windmills and driven sailing ships (see Wind Energy). Modern windmills are strong, light, weather-resistant, aerodynamically designed machines that produce electricity when attached to.

Approximately 30 percent of the solar power reaching Earth is consumed by the continuous circulation of water, a system called the water cycle or hydrologic cycle. The Sun's heat evaporates water from the oceans. Winds transport some of the water vapor from the oceans over the land where it falls as rain. Rainwater seeps into the ground or collects into streams or lakes and eventually returns to the ocean. Thus, radiant energy from the Sun is transformed to potential energy of water in streams and rivers. People can tap the power stored in the water cycle by directing these flowing waters through modern turbines. Power produced in this way is called hydroelectric power.

The oceans also collect and store solar energy. A significant fraction of the Sun's radiation reflects or scatters from the water's surface. The remaining fraction enters the water and rapidly diminishes with depth as the energy is absorbed and converted to heat or chemical energy. This absorption creates differences in temperature between layers of water in the ocean called temperature gradients. In some locations, these differences approach 20°C (36°F) over a depth of a few hundred meters. These large masses of water existing at different temperatures create a potential for generating power. Energy flows from the high-temperature water to the low-temperature water. The flow can be harnessed, to turn a turbine to produce electricity for example. Such systems, called ocean thermal energy conversion systems, require enormous heat exchangers and other hardware in the ocean to produce electricity in the megawatt range.

extract	:	çıkartmak
resistant To	:	dirençli
attach	:	iliştirmek
generate	:	üretmek
approximately	:	yaklaşık
= nearly		
=virtually		
=about		
=almost		
consume	:	tüketmek
evaporate	:	buharlaşmak
eventually	:	sonunda
transform	:	dönüştürmek
flow	:	akmak,akıntı
tap	:	musluk,tıkamak
store	:	depo, depolamak
significant	:	önemli
fraction	:	bölüm
reflect	:	yansıtma
scatter	:	dağıtmak,saçmak
rapidly	:	hızlıca
diminish	:	azalmak
depth	:	derinlik
absorb	:	emmek
convert INTO/TO	:	dönüştürmek
approach	:	yaklaşım, yaklaşmak
existing	:	var olan
harness	:	kullanmak
conversion	:	dönüştürmek
require	:	gerektirmek
enormous	:	
=huge	=massive	
=vast		
=giant		büyük,kocaman
=tremendous		
=gigantic		
=immense		

Plants, through photosynthesis, convert solar energy to chemical energy, which fuels plant growth. People, in turn, use this stored solar energy through fuels such as wood, alcohol, and methane that are extracted from the plant life (biomass). Fossil fuels such as oil and coal are derived from geologically ancient plant life. People also eat and digest plants, or animals fed on plants, to obtain energy for their bodies.

VOCABULARY

plant	:	bitki, dilmek, fabrika
through	:	arasından, sayesinde
in turn	:	sıra ile
derive from	:	türemek, türemek
ancient	:	eski
digest	:	sindirmek
feed on	:	ile beslenmek
obtain	:	elde etmek

3- Evolution

Evolution, in biology, is a complex process by which the characteristics of living organisms change over many generations as traits are passed from one generation to the next. The science of evolution seeks to understand the biological forces that caused ancient organisms to develop into the tremendous and ever-changing variety of life seen on Earth today. It addresses how, over the course of time, various plant and animal species branch off to become entirely new species, and how different species are related through complicated family trees that span millions of years.

Evolution provides an essential framework for studying the ongoing history of life on Earth. A central, and historically controversial, component of evolutionary theory is that all living organisms, from microscopic bacteria to plants, insects, birds, and mammals, share a common ancestor. Species that are closely related share a recent common ancestor, while distantly related species have a common ancestor further in the past. The animal most closely related to humans, for example, is the chimpanzee. The common ancestor of humans and chimpanzees is believed to have lived approximately 6 million to 7 million years ago. On the other hand, an ancestor common to humans and reptiles lived some 300 million years ago. And the common ancestor to even more distantly related forms lived even further in the past. Evolutionary biologists attempt to determine the history of lineages as they diverge and how differences in characteristics developed over time.

Throughout history, philosophers, religious thinkers, and scientists have attempted to explain the history and variety of life on Earth. During the rise of modern science in western Europe in the 17th and 18th centuries, a predominant view held that God created every organism on Earth more or less as it now exists. But in that time of burgeoning interest in the study of fossils and natural history, the beginnings of a modern evolutionary theory began to take shape. Early evolutionary theorists proposed that all of life on Earth evolved gradually from simple organisms. Their knowledge of science was incomplete, however, and their theories left too many questions unanswered.

VOCABULARY

evolution	: evrim
characteristic	: özellik
trait	: özellik
pass from-to	: geçmek
generation	: nesil
seek	: araştırmak
tremendous	: büyük
address	: hitap etmek
various	: çeşitli
entirely	: tümüyle, tamamen
complicated	: karmaşık
provide	: sağlamak
essential	: gerekli
framework	: çerçeve, iskelet
ongoing	: devam eden
controversial	: tartışmalı
component	: bileşen, parça
share	: paylaşmak
common	: yaygın, ortak
distant	: uzak
closely	: yakından
related to	: ilgili
on the other hand,	: öte yandan
attempt	: girişmek
determine	: belirlemek
diverge	: yayılmak, sapmak
throughout	: boyunca
religious	: dini, dindar
thinker	: düşünür
predominant	: egemen
burgeoning	: gelişen
propose	: tektif etmek
gradually	: aşamalı olarak
incomplete	: eksik

Most prominent scientists of the day remained convinced that the variety of life on Earth could only result from an act of divine creation.

In the mid-19th century a modern theory of evolution took hold, thanks to British naturalist Charles Darwin. In his book *On the Origin of Species by Means of Natural Selection*, published in 1859, Darwin described the evolution of life as a process of natural selection. Life, he suggested, is a competitive struggle to survive, often in the face of limited resources. Living things must compete for food and space. They must evade the ravages of predators and disease while dealing with unpredictable shifts in their environment, such as changes in climate. Darwin offered that, within a given population in a given environment, certain individuals possess characteristics that make them more likely to survive and reproduce. These individuals will pass these critical characteristics on to their offspring. The number of organisms with these traits increases as each generation passes on the advantageous combination of traits. Outmatched, individuals lacking the beneficial traits gradually decrease in number. Slowly, Darwin argued, natural selection tips the balance in a population toward those with the combination of traits, or adaptations, best suited to their environment.

VOCABULARY

prominent	: önde gelen, göze çarpan
convinced	: ikna olmuş
result from	: -den kaynaklanmak
divine	: kutsal, ilahi
creation	: yaratılış
thanks to	: sayesinde
by means of	: sayesinde
describe	: tanımlamak
suggest	: önermek, göstermek
process	: işlemişüreç
competitive	: rekabetçi
struggle	: çabalamak
survive	: hayatta kalmak
in the face of	: koşullar altında
resource	: kaynak
compete	: yarışmak, rekabet etmek
ravage	: yıkmak
predator	: avcı
disease	: hastalık
deal with	: uğraşmak, ele almak
unpredictable	: tahmin edilemez
shift	: değişmek, değiştirmek
offer	: teklif etmek, teklif
given	: belirli, verilmiş
certain	: belli, bazı, kesin
individual	: birey
possess	: sahip olmak
likely	: muhtemel
offspring	: nesil
the number of	: sayısı
increase	: artmak
advantageous	: avantajlı
combination	: birleşme
outmatch	: üstün olmak
lack	: yoksun olmak
beneficial	: faydalı
decrease	: azalmak
argue	: tartışmak, iddia etmek
adaptation	: uyum

4- Hybrid Gas-Electric Vehicles

The weaknesses of batteries led to the marketplace failures of some pioneering electric cars such as General Motors' EV1 and Honda's EV Plus in the late 1990s. Customers refused to accept the limited range and power of these vehicles, and the manufacturers halted production. Development of such cars, however, pushed forward the technology for electric power trains, resulting in more efficient methods of converting battery power between the direct current (DC) used in most batteries and the alternating current (AC) required by the motors best suited to automotive use. Although developed for cars using batteries, this electric power train technology will still be useful in cars that get their electricity from fuel cells. Most automakers appear to be looking toward a future in which fuel cells will convert hydrogen, methanol, or some other fuel into electricity to drive the cars of the future. Many experts believe cars powered by fuel cells will go on sale as early as 2010.

Until cars with fuel cell technology come to market, automotive experts believe that car manufacturers will offer hybrid electric vehicles (HEVs) in wide variety. These HEVs represent an interim step, taking advantage of clean electric power, but also of proven internal combustion engine technology. These systems are similar to the diesel-electric locomotives that replaced steam engines on railroad trains. (In trains, diesel engines charge batteries that drive motors in the wheels.) Electronic components enable internal combustion engines, powered either by gasoline or diesel, to charge a car's batteries, propel it down the road, or shut down entirely. An HEV at a stoplight typically sits silent, burning no fuel and making no pollution, if the batteries are in a sufficient state of charge. If driven slowly, as in heavy traffic, the vehicle might move only on electric power. Only when more power is demanded for acceleration or to move a heavy load, does the gasoline or diesel engine come into play.

VOCABULARY

weakness	: zayıflık
lead to	: yol açmak
failure	: başarısızlık
pioneering	: öncü
customer	: müşteri
refuse	: reddetmek
accept	: kabul etmek
limited	: sınırlı
range	: yayılmak
vehicle	: araç
manufacturer	: üretici
halt	: durmak
useful	: kullanışlı
appear	: görünmek, ortaya çıkmak
look toward	: ileri bakmak
expert	: uzman
go on	: devam etmek
offer	: sunmak, teklif etmek
represent	: temsil etmek
interim	: geçici
take advantage of	: kullanmak, faydalanmak
proven	: ispatlanmış
internal	: iç
combustion	: yanma
similar to	: benzer
replace	: yerine koymak
enable	: mümkün kılmak
propel	: itmek
shut down	: kapatmak
entirely	: tümüyle
silent	: sessiz
sufficient	: yeterli
demand	: talep, talep etmek, gerektirmek
acceleration	: hızlandırma
load	: yük, yüklemek

VOCABULARY

supplement	:	takviye etmek,
efficient	:	etkili
provide	:	sağlamak
require	:	gerektirmek
complicated	:	karmaşık
add	:	eklemek
currently	:	şu anda
receive	:	almak
combine	:	birleştirmek

The earliest examples of HEVs, such as the Honda Insight and Toyota Prius, use electric motors to supplement engines that are smaller and more fuel-efficient than they would be if they had to provide all the power alone. These cars are complex, however, because the engines are used not only as generators to charge batteries, but also to move the car. Using both gasoline and electricity requires more complicated transmissions and other systems that add weight. Some systems even use the gasoline engine to drive the rear wheels and electric power at the front wheels for a form of four-wheel drive.

Currently, there are three types of drivetrains that operate HEVs. A drivetrain is the system of components that transfer power to the axle that turns, or drives, the wheels of the vehicle. The three types are the series drivetrain, the parallel drivetrain, and the series/parallel drivetrain. In the series type only the electric motor turns the wheels. The motor receives power from the batteries or from a generator that is powered by a gasoline engine. The series type performs at its best in stop-and-go city driving. General Motors' prototype Volt HEV uses a series drivetrain. In the parallel type both the gasoline engine and the electric motor generate power that turns the wheels. The Honda Motor Company uses the parallel type in its Insight, Civic, and Accord HEVs. The series/parallel type combines the designs of both and is used in the Toyota Prius and the Ford Escape Hybrid. This type of drivetrain operates as a series type at low speeds and as a parallel type at high speeds. It requires a generator, a larger battery pack than in other types, and more complex computers.

Because HEVs make less pollution and save fuel, they are expected to become more commonplace despite the added complexity. Current HEVs get about 77 km (48 mi) per gallon in city driving and 72 km (45 mi) per gallon in highway driving, according to efficiency ratings issued by the Environmental Protection Agency (EPA) in February 2007. However, PHEVs hold greater promise for fuel efficiency and lower greenhouse gas emissions, such as the carbon dioxide released by internal-combustion engines. That is because the PHEV can operate on the battery alone if the driver's commute only requires use of the electric motor, and the electric motor is recharged from a household outlet. The PHEV may never require use of the gasoline engine. Power plants that supply household electricity may use only hydro or nuclear power or make more efficient use of fossil fuels.

VOCABULARY

pollution	:	kirlilik
save	:	kurtarmak, biriktirmek
expect	:	beklemek
commonplace	:	sıradan
despite	:	-e rağmen
according to	:	-e göre
promise	:	söz, söz vermek, umut
efficiency	:	etkililik
release	:	salmak, çıkarmak
operate	:	çalışmak
commute	:	takas etmek
outlet	:	çıkış noktası
supply	:	kaynak, sağlamak

5-Earthquake

Earthquake is the shaking of the Earth's surface caused by rapid movement of the Earth's rocky outer layer. Earthquakes occur when energy stored within the Earth, usually in the form of strain in rocks, suddenly releases. This energy is transmitted to the surface of the Earth by earthquake waves. The study of earthquakes and the waves they create is called seismology. Scientists who study earthquakes are called seismologists.

The destruction an earthquake causes depends on its magnitude and duration, or the amount of shaking that occurs. A structure's design and the materials used in its construction also affect the amount of damage the structure incurs. Earthquakes vary from small, imperceptible shaking to large shocks felt over thousands of kilometers. Earthquakes can deform the ground, make buildings and other structures collapse, and create tsunamis (large sea waves). Lives may be lost in the resulting destruction.

Earthquakes, or seismic tremors, occur at a rate of several hundred per day around the world. A worldwide network of seismographs (machines that record movements of the Earth) detects about 1 million small earthquakes per year. Very large earthquakes, such as the 1964 Alaskan earthquake, which caused millions of dollars in damage, occur worldwide once every few years. Moderate earthquakes, such as the 1989 tremor in Loma Prieta, California, and the 1995 tremor in Kōbe, Japan, occur about 20 times a year. Moderate earthquakes also cause millions of dollars in damage and can harm many people.

In the last 500 years, several million people have been killed by earthquakes around the world, including over 240,000 in the 1976 T'ang-Shan, China, earthquake. Worldwide, earthquakes have also caused severe property and structural damage. Adequate precautions, such as education, emergency planning, and constructing stronger, more flexible, safely designed structures, can limit the loss of life and decrease the damage caused by earthquakes.

VOCABULARY

shake	:	sallamak
surface	:	yüzey
rapid	:	hızlı
movement	:	hareket
rocky	:	kayalık
outer	:	dış
layer	:	tabaka
strain	:	zorlamak
suddenly	:	aniden
destruction	:	yıkım
depend on	:	dayanmak
magnitude	:	büyüklik
duration	:	devam,süre
construction	:	yapım,inşa
affect	:	etkilemek
incur	:	maruz kalmak, uğramak
vary	:	değişmek
imperceptible	:	algılanamaz
deform	:	biçimini bozmak
collapse	:	çökmek
tremor	:	depem, titreme
detects	:	bulmak
moderate	:	hafiletmek, makul,ölçülü
harm	:	zarar vermek
including	:	dahil
property	:	özellik
adequate	:	yeterli
precaution	:	önlem
education	:	eğitim
emergency	:	acil durum
loss	:	kayıp