Chernobyl Aftermath - Life Always Finds a Way

After the meltdown of the Chernobyl nuclear reactor in 1986, the area was evacuated and deemed inhospitable. Surprisingly, however, a new, bold ecosystem has developed in the wake of disaster.

PRACTICAL SCIENCE WITH PHIL FREDA

On April 26, 1986, the Chernobyl nuclear reactor near the town of Pripyat in what is now the Ukraine, was the place of a nuclear disaster.

According to the International Atomic Energy Agency (IAEA), the number four reactor went out of control during a unauthorized system test. A resulting power surge and an unsuccessful attempt to perform an emergency shutdown caused the rupturing of a reactor and a series of explosions.
This led to a meltdown where the uranium fuel melted through the protective barriers, leaking large quantities of radioactive material into the atmosphere and into the surrounding area.

According to an article on Science A GoGo, the blast spread more than 200 times the radiation than the bombs dropped on Hiroshima and Nagasaki.
As a result, two workers died in the explosions, accompanied by an additional 28 emergency responders that died from radiation sickness. The disaster may also be accountable for an additional 4,000 deaths due to cancer, according to an article on Environmental Graffiti. Also, 49,360 people from Pripyat and 67,000 people from other surrounding areas were evacuated.
The area was deemed as the "Zone of Alienation" by the Soviets. An area of 2,485 square miles was "sealed off" from humanity and deemed inhospitable.

Life always finds a way
After the disaster, plant and animals species in the surrounding area suffered many mutations due to the radiation.
Animals experienced birth deformities, and leaves of many plants changed shape. Also, many plants and animals died from large doses of radiation exposure.

Increased levels of radioactive material have a deleterious effect on living systems by interfering with and disrupting important chemical bonds (especially in DNA) in the cell.

DNA holds genetic material vital for performing the required actions of all living things, whether it be metabolism or reproduction. Interference in the DNA molecules causes mutations and even cancer (US Department of Energy).
Despite all this, animal and plant species in the "Zone of Alienation" are now thriving.

According to an article on nature.com and Viktor Dolen, who studies the environmental effects of radioactivity at the Ukrainian National Academy of Science in Kiev, 100 species of threatened species are now found in the evacuated zone. Around 40 of these species, including large predators like wolves and bears, were not there prior to the accident.
In the same article, James Morris of the University of South Carolina added that if such large predators are found, plants and animals that support them must also be thriving.

How did this happen?
It all reverts back to evolution and natural selection.
Morris explained, “It's evolution on steroids. There are a lot of deleterious mutations in species, but these seem to be very quickly weeded out.”

In other words, individuals who experience developmental effects as a result of the higher radiation are selected against quickly, leaving only very fit individuals for the next generation.

It is important, however, that genetic diversity among plants and animals continues to diversify. A lack in genetic diversity may lead to a bottleneck effect, which could lead to disease susceptibility, mutation and predation.

Species of bat, hare, deer, wolf, bear, lynx, owl, wild boar and even horses are thriving in the exclusion zone outside of the reactor.

Even the plants have started to reclaim the area.

According to an article by National Geographic, the red color of dying pines earned a large area near the reactor the name "the Red Forest."
Featured in this article, Sergey Gaschak from the International Radioecology Laboratory in Kiev, states that the Red Forest is now a real green forest due to an influx of growing birch trees.

The downside
The area is not exactly the garden of Eden, however; according to scientists, there are still some deleterious effects in the exclusion zone.

One species that seems to be having a hard time is the barn swallow. This small migratory bird has displayed higher than normal mutation rates. Scientists believe that these birds are vulnerable because of the exhaustion that long migration has on the body. These birds have low levels of reserves and antioxidants, which protect against mutation, after migration.

The radiation also seems to be affecting the growth signaling in trees. Specific hormones tell a tree which way to grow. Some trees in the area seem to be “deformed,” and according to USC biologist James Morris, the trees do not seem to know which way is up.

Most scientists believe that these effects will diminish over time, and it cannot be ignored how well the ecosystem has bloomed and triumphed after the disaster.

Life without human interaction
I find it interesting to see how well life has overcome an obstacle such as Chernobyl.

Despite large amounts of radiation and resulting mutation, wildlife is still growing, diversifying and even thriving.

What is more interesting, however, is how well this new, bold ecosystem is fairing in the absence of the human population. It was stated that the wildlife now is far more diversified and abundant than when it was before the accident.

Are we really that bad? It seems nature can deal with radioactive fallout better than “coexisting” with us humans.

It will take more time and experimentation to determine Chernobyl's long-term future, but for now, things are looking up, so much so that the area around Chernobyl may even become a wildlife reserve one day. Think about it!