The Shadow of Chernobyl: Forty Years After the Disaster

Four decades have passed since 26 April 1986, when Reactor No. 4 at the Chernobyl nuclear power station exploded, causing the worst civil nuclear accident in history. Although the physical ruins have long been covered by a gigantic steel sarcophagus, the invisible legacy of the disaster remains with us to this day. Radioactive isotopes such as *caesium-137*, undergo a slow half-life, but, having become integrated into the cycle of nature, they remain present in Europe's ecosystems.

The *'Chernobyl effect'* is now not merely a historical tragedy, but an ongoing environmental health and scientific challenge. Whilst the former exclusion zone has become a unique wildlife reserve, thousands of kilometres away – for example, in the forests of Bavaria or the Austrian Alps – fungi and wild animals still carry the radioactive remnants of the rainfall from forty years ago

Radioactive Bavarian wild boars

In southern Bavaria, particularly at the foot of the Alps and in the Bavarian Forest, radioactive contamination can still be detected today in certain species of fungi and in wild boars. The contamination is primarily due to **caesium-137** , which entered the soil via rainfall following the 1986 Chernobyl disaster.

Bavaria and Austria were hit by a much greater amount of radioactive fallout in 1986 than Hungary, as the Alps trapped most of the contaminated clouds, and there, rainfall washed a much greater quantity of radioactive material into the soil.

Certain mushrooms, such as the brown milk cap and the yellow comb, or indeed the truffle family, are more prone to accumulating caesium, which remains quite radioactive. As it happens, wild boars love truffles, so whilst the radioactivity levels of most forest animals (such as roe deer or red deer) have fallen significantly over the years, those of wild boars have remained surprisingly high. Scientists refer to this as the 'wild boar paradox'. Furthermore, a 2023 study showed that wild boars contain not only Chernobyl fallout but also residues from atmospheric nuclear weapons tests carried out in the 1960s.


Wild boars foraging for truffles in Bavaria and Austria consume radioactive material in incredibly high concentrations. / Photo: Getty Images

Strict regulations govern the sale of game meat in Germany; only meat with a radiation level of **is below 600 becquerels per kilogram** .

In Bavaria, hunters have meat samples (usually 500 grams of pure muscle tissue) taken from the animals they have shot measured at special monitoring stations. There are currently more than 70 such stations operating in the region, which are run by the **Bayerischer Jagdverband** (*Bavarian Hunting Association*). The measurements are carried out using highly sensitive gamma spectrometers (often *scintillation detectors*), which can accurately distinguish the characteristic radiation of the caesium-137 isotope from background radiation. If the measured value exceeds the limit of 600 Bq/kg, the meat may not be placed on the market and must be destroyed.

The gene pool of animals in the Chernobyl area has changed

Scientific research confirms that the gene pool of animals in the Chernobyl area has changed in several species. However, this does not *'science fiction mutations'* (such as two-headed animals or horrific monsters), but rather a rapid evolutionary adaptation to the harmful effects of radiation.

The **Eastern green toads** living in the zone have undergone a significant colour change: outside the area they are bright green, whilst near the reactor they are much darker, often completely black. Research suggests that high levels of melanin (which results in a dark colour) protect the animals' DNA from radiation. The frogs that survived and reproduced were the darker ones, so within a few generations this colour became dominant.

A 2024 study showed that the **grey wolves** living in the zone had altered immune systems, similar to those of cancer patients undergoing radiotherapy. They have become genetically more resistant to cancer, which may also aid in the treatment of human cancer in the future.

The **stray dogs** now have a gene pool that differs markedly from that of dogs living anywhere else in

the world. Although these animals are descendants of pets left behind at the time of the accident, continuous radiation exposure and isolation have resulted in the emergence of a genetically unique population. In the wild, animals born with severe physical mutations (such as two heads or deformed limbs) almost never survive to adulthood and are therefore unable to reproduce. Those living in the zone today are the *'gene pool of the survivors'* : subtle molecular changes that help them survive in the face of an invisible threat.

DNA tests have shown that the dogs' genetic makeup has evolved in such a way that their immune systems and cell division processes are more resistant to radiation-induced cancer. Similar to the frogs mentioned earlier, some researchers hypothesise that darker fur may offer an advantage in terms of radiation protection, although this has not yet been proven as conclusively in dogs as it has in amphibians.

These changes are not beneficial for all species. Many **birds** (such as the sooty swift) have been observed to have smaller brain sizes, more frequent tumours and discolouration of the plumage (*partial albinism*), which is a sign of genetic damage.

The success story of the 'Red Forest' and Przewalski's horses

Although the pine forest in the immediate vicinity turned red and was destroyed by radiation following the explosion, today this area is home to one of the world's rarest horse breeds, the **Przewalski's horse**. The population of the few individuals released into the wild in 1998 has since grown sevenfold, and the animals are visibly healthy, despite grazing even in the most contaminated zones and using abandoned Soviet stables and buildings as shelter from harsh weather and insects.



Przewalski's horses use the abandoned buildings for various purposes, including resting and seeking shelter from insects (particularly during the summer months), sleeping, and giving birth to foals. / Photo: University of Georgia

The Przewalski's horse is the only *'true'* wild horse species that is genetically distinct from domesticated horses (they have more chromosomes). Following the reintroduction in 1998, many individuals perished, but the survivors were genetically more resilient to environmental stress. The

population has now exceeded 150–200 individuals, and the horses' bodies have adapted to living with low-dose but constant background radiation.

According to researchers, the horses' health is surprisingly good. They show no visible tumours or deformities. The reason for this is that, in the wild, sick or weak individuals are quickly culled by wolves, so only healthy, resilient animals remain in the herds, passing on the *'good'* genes.

Overall, the case of Przewalski's horses demonstrates that, for nature, human presence (hunting, habitat destruction) is often a more destructive factor than invisible radioactive radiation.

Radiotrophic fungus

The organisms discovered amongst the ruins of the Chernobyl reactor not only survive the lethal radiation, but some species have actually become capable of using it as a source of energy. These **radiotrophic fungi**(*radiotrophic fungi*).

It was first noticed in 1991 that a black, mould-like coating had appeared on the interior walls of the exploded Reactor 4. Researchers observed that the fungi did not grow randomly, but rather 'converged' *"tended"*. These fungi contain extremely high levels of melanin – the same pigment responsible for the colour of human skin and eyes. In the case of fungi, however, melanin not only provides protection but, through a process known as radiosynthesis, converts gamma radiation into chemical energy, which the fungus then uses for its growth. This is similar to the way plants utilise sunlight during photosynthesis.



A radiotrophic fungal colony in the former reactor control room / Photo: TechEBlog

NASA and other space agencies are conducting intensive research into these species. As the layers of the fungus absorb radiation, in future they could serve *they could act as "living shields"* protect astronauts from cosmic radiation in outer space or at Martian bases.

In 2020, researchers sent one such fungal species, **Cladosporium sphaerospermum** to the **International Space Station**(*ISS*) to investigate whether the fungus could be used for radiation protection in space.

A Petri dish was used for the experiment, with only one half coated with the fungus and the other left empty. Radiation detectors (Geiger counters) were placed beneath the dish to measure the amount of radiation passing through. A layer of fungus just 2 millimetres thick was able to absorb around 2 per cent of cosmic radiation. This may seem like a small amount at first glance, but the researchers calculated that a *'living wall'* would be sufficient to block a significant proportion of the radiation on Mars.

The greatest advantage of the fungus over conventional materials (such as lead or aluminium) is that it is alive and reproduces. If the shield is damaged, or if more protection is needed, the fungus simply needs to be *'fed'* and it will regenerate itself.

According to long-term plans, cavities built into the walls of Martian bases would be filled with this fungus, so that settlers would not need to transport radiation shields weighing several tonnes from Earth; it would be enough to take a small sample and *'grow'* the protection on site. Interestingly, the fungus grew even faster in the microgravity conditions of the ISS than it did on Earth, making it even more suitable for use in space.

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Sources

GRS.de: Contamination of mushrooms and wild boar with radioactive caesium-137
Federal Office for Radiation Protection: Radioactive contamination of mushrooms and wild game
Science.org: Germany’s radioactive wild boars are a bristly reminder of nuclear fallout
Lichtenfels District: Radioaktivitäts-Messstellen
ScienceDirekt.com: Chernobyl as a natural laboratory: Genetic instability, adaptation, and ecological recovery in flora and fauna under chronic radiation
science.org: The Dogs of Chernobyl: Demographic insights into populations inhabiting the nuclear exclusion zone
BBC: The Mysterious black fungus from Chernobyl that may absorb radiation
Wikipedia: Radiotrophic Fungus
ResearchGate.net: Genetic diversity of the free-living population of Przewalski’s horses in the Chernobyl Exclusion Zone
curiousclinicians.com: Episode 114 – The mould that eats radiation for breakfast
techeblog.com: Fungus Nuclear Reactor Found Inside the Chernobyl Disaster Site That Actually Feeds on Radiation

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