

Translation from Russian into English

Scientific Hypotheses

All serious scientific discoveries are often based on hypotheses, which one may find strange and unusual. Many of them are even made fun of by the community of scientists, but, in the end, become justified scientific theories. In this video I'm going to tell you about the most unusual hypotheses that exist now or existed before. Some of them may prove to be true, and some may turn out to be just absurd, however somebody still believes in them. These are 10 interesting facts about unusual and strange scientific hypotheses.

1. In the 1980s in Great Britain, cows on some cattle farms were fed with a very odd food. The mixture was made from other cows and sheep. The carcasses of these animals were grinded and turned into some kind of flour, and then fed to the cows. However, this cannibalism was considered to be normal and didn't bother supervisor authority in Great Britain. But, as you may guess, something went wrong. In 1986 in Great Britain a mysterious disease occurred. The people suddenly got depressed, they lost interest in their close ones and in anything at all. Then people's memory sharply worsened, they couldn't take care of themselves and couldn't even eat. Afterwards they became unable to walk, quickly lost weight and, in the long run, died. As you can see, it soon became clear that the reason for this was the cows, or to be more precise, the food which was consumed by them. People who ate the meat of these cows were infected with a very rare disease that affects the human's brain. With it (причем), the illness isn't caused by bacteria or viruses, but by something different – prions. They're a kind of protein with an abnormal structure. The proteins destroy an organism's nearby cells due to their features. And so people ate the cows' meat and were infected by a certain disease, which is caused by these prions. This illness is called Creutzfeldt-Jakob disease. The prions get into a patient's brain and start to destroy it gradually, bringing it to depression, apathy, inability to walk and eat, and then to death. However, what is interesting – the first symptoms can manifest in many years after infecting someone. In the case of the cows in Britain the symptoms first started to appear after 5 or 6 years. But, on the other hand, when they occurred, the illness developed quickly and people died. You may ask why I'm telling you this story in the first place, if the video is about strange theories and hypotheses? Well, many scientists believe it is quite possible that there's a ton of lethal diseases, symptoms of which manifest in a few years, or even decades after affecting a human. Apart from that, the disease may be infectious/contagious before the symptoms appear. It is pretty possible that a significant part of people on our planet is already infected with a terrible disease, maybe with a virus, which doesn't have any symptoms yet and doesn't kill anyone, but is just spreading all over the Earth right now. And when the virus will manifest, then it'll probably be too late and mankind won't be able to discover/invent the cure for it in time. In the end, more than 200 British people died from the disease, caused by eating the cows' meat. The first cases were recorded in 1986, and the last one happened in 2009. It's unknown how many British are still infected and still don't even know about that, and there's a chance that there'll be more victims in future, as the symptoms may occur in decades since being infected with the illness.
2. Contemporary science believes that our universe once was just a tiny dot, in which all matter with an incredible density was situated. Everything that all stars and planets are made of. But then the universe started to expand quickly, and it was called The Great Explosion. There's a big number of evidence that everything was just like that. However the theory of The Great Explosion doesn't say anything concerning what was before that and how everything appeared; where singularity or, in other words, the small dot with a huge density where everything was situated, comes from is unknown. There're a lot of various hypotheses which are impossible to be proved. Some of them aren't scientific at all, but some do have a certain theoretical justification. One of those hypotheses is a so-called black hole cosmology. It is very contradictive, though. In 1972 two physicists, Raj Pathria and Irving Good, proposed the model of the universe's origin. To put it briefly, according to this hypothesis, our

universe is situated inside a gigantic black hole. Now let's look into details. According to the contemporary concept of black holes, there's a dot with a huge density inside them, which is called singularity. Due to the force of a strong gravitation, all the matter gets there and is being compressed, and the dot becomes more and more dense. Hence in accordance with the black hole cosmology, the universe appeared from such a singularity of an incredibly big black hole. It accumulated so much substance and energy that all known laws of physics changed the way they worked, the singularity either collapsed or fell into another dimension, extremely changing the space and time around itself thanks to its gravitation. Afterwards the explosion happened in this new space and created our universe. This hypothesis isn't supported by most physicists, though some serious scientists still suppose it may be true. The results of certain observations after our universe are matching with the conclusions, which are made from the black hole cosmology. It proves that black holes can possibly create whole universes; that our universe appeared owing to a black hole in another universe, and that one, in turn, appeared owing to a universe higher along the stairs/branch(?). Unfortunately, it is impossible to check the hypothesis in an experimental way. We most likely will never find out how actually our universe occurred, so we'll have to settle with such hypotheses and assumptions.

3. Our universe is enormous, we can't imagine how much there're galaxies in it, and even more planets and stars. If the life has occurred on the Earth, then it is very likely to exist somewhere else. And if we'll also consider the age of our universe, we may suppose there have to be other planets with intelligent life and with developed technologies. Such aliens might have develop to such extent that they could travel to other stars and planets. Though, unfortunately, we haven't found any proofs of existence of intelligent life on other planets. There's no evidences for aliens to have been visited our planet, as well as we aren't able to receive any signals from them. For example, radio waves, because aliens might have for sure discovered it for such a long time, and in space the radio waves can travel with the light's speed. Hence even if they are very far away from us, the amount of time would be enough to reach us from the most distant planet. We haven't also seen any aliens' spaceships nor probes(зонд). To put it briefly, our universe is billions years old. There could and must have occurred many technologically developed civilizations for all this time. But where are they? It is called Fermi paradox, in the name of Italian physicist Enrico Fermi, who created it. And one of the very interesting ways to explain the Fermi paradox is Great Filter hypothesis. According to it, the civilizations aren't able to develop in the space because of something that prevents it. They can't overcome a certain phase. For instance, it is possible that all civilizations invent nuclear weapon and afterwards kill themselves during a war. They may create nanorobots which go out of control and destroy them. Or the resources of a planet probably just end, and they still haven't colonized other planets by that time. All in all, it just leads to the utter cessation of civilization's existence or doesn't allow it to develop into interstellar civilization and to colonize other solar systems. There's a chance that we will face this problem as well, and it would be frustrating. But it's still possible that we've already passed the Great Filter. After all, the most troublesome stage in civilization's development to overcome might be the occurrence of multicellular life, the stage that we've already passed, though it might not have happened on other planets. In such case we should rejoice. But we have to remember that the Great Filter is just one of multiple attempts to explain the fact we haven't seen any aliens. Theoretically, life might be in general a very rare phenomenon in the universe, and there might be no other planets, apart from the Earth, where life could exist.
4. You could've noticed that for the last 20 or 30 years infectious diseases continue to flare up in the world. Ebola, atypical pneumonia, avian influenza(bird flu), swine influenza, and, of course, covid-19. Generally speaking, we started to face various viruses and bacteria excessively often. And so nowadays many biologists believe everything that is happening now is minor issues. In future we will have to deal with much more terrifying ones. That's because pathogenic bacteria and viruses are evolving much faster than we and our science. And at the end of the day, it may lead to bacteria and viruses just not reacting to the medicines that we use to fight with them. Even now there's a term such as antibiotic resistance/tolerance. It is when pathogenic bacteria eventually gain a kind of immunity

to antibiotics, and thus bacteria don't die from them. We have to use another antibiotic against them then. However, there's a possibility that bacteria, resistant to all kinds of antibiotics, will occur at one point, and there'll be no other cure for it. In that case a big catastrophe will await mankind, an infectious disease which we won't be able to treat. Bacteria and viruses are evolving now so quickly, since people travel around the world by planes, transmitting them all across the planet. The number of people is as enormous as it's never been before, hence it gives an excellent opportunity for viruses and bacteria to mutate and spread quickly. So it is quite possible that the end of our civilization will happen not because of a nuclear war, but a large-scale and killing epidemic of a virus.

5. Here's another hypothetical scenario of how our civilization may collapse. Although it's more fantastic, nevertheless. The technologies are developing at a high speed. Blockchain, artificial intelligence – all this seemed to be something unbelievable only 25 years ago. But what's waiting for us in the future? Many people pin their hopes on nanotechnology, which may reveal a lot of opportunities for mankind. Tiny nanorobotics will be able to cure patients right from inside, constantly staying in their organisms. Nanorobotics will also be a perfect solution for creating different things, since if they assemble in large groups, they'll be able to put together complicated devices with perfect precision, molecule after molecule. Still pessimistic futurologists fear nanotechnologies may turn out to be the cause of our civilization's end. The thing is, if nanorobotics will be able to make their copied versions from scrap materials, they might break out and start multiplying, constantly creating their new copies. Theoretically, such a swarm of nanorobotics would in a matter of days turn all Earth's surface into a gray mass that consists of microscopic nanorobotics and there would be no saving for that.
6. Have you ever thought about why you can feel and perceive the surrounding world? This question may seem absurd, but it interests most of scientists, who study the brain, as well as philosophers. If we imagine our brain to be a computer, then why can't it just receive the information, process it and response to the stimuli in different behaviors/ways. This question has been called the hard problem of consciousness. To put it as simply as it's possible, it is about why and how our brain creates consciousness. There're multiple hypotheses on this topic, and science hasn't been able to explain its work yet. Nowadays a lot of scientists are inclined to believe that consciousness is created in the brain, when it's being in a particular state. However it is not yet clear, which state precisely have to be in order to create consciousness, the science may probably answer this question soon. Still, there's another model – panpsychism. Proponents of this theory claim that our consciousness is being controlled by all the matter of the universe, stones, cheese, metals etc. have it too. They believe consciousness is another feature of elementary particles. As panpsychists think, the consciousness occurs in the brain due to elementary particles, which the brain is made of, because they itself have consciousness, though their form is really simple. But when being gathered in a certain way, in other words, turning into a structure as the brain, they create a complicated consciousness. such as human consciousness. This was very simplified and primitive explanation of panpsychism. It may not sound convincing, but we have to say that such prominent scholars as philosopher Bertrand Russell and the founder of scientific psychology William James sympathized with this model of explanation for consciousness and supposed that it may be close to be true.
7. Another hypothesis which isn't supported by any good scientist, though we should talk about it, since somebody still believes in such a thing. In 1976 American psychologist Julian James presented a book with a tricky name "The Origin of Consciousness in the Breakdown of the Bicameral Mind" in which he supposed that 3 thousand years ago people didn't have a single consciousness, but had, in fact, two ones. The right hemisphere consciousness and the left hemisphere consciousness. One hemisphere could speak and give orders, and the other one could only obey. Hence, according to this hypothesis, the ancestors perceived the inner dialog not as their thought, but as a real sound. And they considered it to be a voice of god or a leader. It's been telling them what to do. Bicameralism means two chambers/cameras(від латинського слова camera). And indeed, our brain is divided into two

parts. Its hemispheres interact with each other with the help of a particular part, corpus callosum, that connects them. If it's cut up, the person would be able to live, though cerebral hemispheres would stop communicating with each other. What it will lead to, you can find out from my recent video on the brain. But let's return to bicameralism. According to this odd hypothesis, around 3 thousand years ago the brain and consciousness changed due to living in bigger groups, and people's social environment changed vastly. That's why bicameral consciousness has dissipated and gave way for singular consciousness. However, in ancient times there were still people who continued to live with bicameral consciousness and constantly heard one of the hemisphere's clear voice. Just like this, according to Julian Janes, were the Bible prophets, who took the voice as the god's voice and obeyed its orders. Also, as Janes thought, many mental diseases nowadays may be an echo of bicameral consciousness, like schizophrenia. But, as you can guess, the hypothesis about bicameral consciousness couldn't find any support among scientists' community and is considered to be pseudoscience.

8. Throughout the history of life existing on our planet mass extinctions of biological species have been periodically ongoing, so that there have been only a small number of them left. It's been happening, basically, approximately every 25 million years because of natural disasters. So a group of astronauts tried to explain such periodicity with an extraterrestrial intervention. And no, we're not talking about aliens. There's a Nemesis star hypothesis. Nemesis is a very dim and tiny star, which is moving around the Sun along an elongated orbit. Thus every 25 million years it's approaching the Solar system very closely, having an impact(?) on the Oort cloud. Oort cloud is a hypothetical cluster of comets that is situated around the Solar system on a large distance. According to the hypothesis, the Nemesis star affects this cluster of comets, making them fly closer to the Solar system and, in the end, fall on the Earth, causing natural disasters and mass extinctions once in 25 million years. The existence of Nemesis is currently not proved, however among scientists this hypothesis is being considered as possible and not contradictive to science in general. In addition, Nemesis might probably be not a star, but just a planet which is situated so far away from the Sun that we haven't been able to discover it yet.
9. Strange hypotheses that explain our world existed even in ancient times. Many of them now seem completely absurd, nevertheless philosophers of the past tended to believe in a lot of such hypotheses throughout centuries. One of those hypotheses was spontaneous generation theory. And here's what it's about. In the past many people thought most living creatures, like rats, worms and snakes, could just arise in certain conditions, and took this idea for granted. In other words, they didn't have to have parents. As ancient people from many civilizations believed, rats could generate from a pile of trash, and worms could just arise from rotting fruits or vegetables. Ancient Egyptians were convinced that crocodiles could be born not from the eggs only, but also arise in the Nile river, where they originally came from. That is, ancestors for sure knew that mice and crocodiles could breed sexually, they just as well believed all those animals might also be generated in a fitting environment. Even Aristotle was a proponent of these views. He thought a certain spiritual nature had an impact on the lifeless matter, making it transform into a living creature. It was as well in the Middle Ages believed in. Dutch scientist Jan Baptist van Helmont once suggested a recipe/formula for creating a mouse – it was needed to take an open jug and fill it with dirty sweaty underwear, and to add a few wheat seeds. As he claimed, in 3 weeks the seeds had to turn into mice. In the Middle Age there were scientists who even believed they could prove this hypothesis. John Needham, a British priest, who lived in the 18th century, drew attention with his experiments with mutton sauce. He poured the mutton sauce into a bottle, boiled it, corked the bottle, boiled it once again, waited for 3 days, and was able to notice microorganisms in this soup afterwards. As he thought, this was the evidence of microorganisms occurring in the matter by themselves. However, another scientist named Spallanzani was an opponent of this theory and claimed that microorganisms generated in the soup due to lack of boiling or because the bottle wasn't corked tightly, thus the microorganisms were able to get into the soup through the air. Later he managed to prove it: when he boiled the broth in bottles and soldered them

well, and the air wouldn't get through it, there were no microorganisms in there. Thanks to his experiments and microscopes spreading widely, eventually the spontaneous generation theory was utterly proven wrong.

10. And finally I'd like to tell you not a scientific hypothesis, but a very odd philosophical idea. How do you think, can you be sure of everything around us being real? That people around you are alive. How can you know that you aren't sleeping or not living in a simulation, in which every person surrounding us isn't just a computer bots, which were programmed to behave in a way people usually do. Do you have an opportunity to get into these people's heads in order to make sure they think, feel and perceive the world too? So there's a philosophical doctrine that claims there aren't any reasons to be really sure that reality actually exists. We can only be certain that you exist yourself, but not other people. This philosophical doctrine is called solipsism. A proponent of such an idea supposes only he exists in this world, and the surrounding universe is just a dream, illusion or computer simulation. All we have access to is our consciousness and our perception. We perceive the world around us, we can see it, but how can we know the world is just as it is? Since our perception is probably not precise, and we see the world the way we see it just because our brain and perception process the signal in this way. You may remember "The Matrix" film. The people that live in the matrix see the surrounding world and think it is real. Though actually the matrix we see in the film is just a computer code, a simulation, which is created to look like the real world. We can suppose that our world too is a simulation, and you can't be completely sure that someone lives in this world, apart from yourself. It is possible that you're the only living creature in the universe. And there's no way to prove it wrong.

What do you think, which of contemporary scientific theories may be proven wrong in future and why? You can leave your answers under the video below. I always read them, and they help to promote the video a lot.