

Chapter 7

Aliens, UFOs, & Abductions

Life Outside of Earth

- Despite decades of space exploration, we still know relatively little about the universe
- In our solar system alone, it took the Voyager spacecraft over 35 years to reach the edge of the solar system, traveling at 60,000 km/hour
- Curiosity abounds about non-terrestrial life

Alien Life

- Around 30% of public thinks that alien spacecraft have visited Earth
- Over 70% think that U.S. government is covering up knowledge about aliens
- Television series and movies about aliens are wildly popular

Science & Aliens

- Frank Drake, an astronomer, held the first search for extraterrestrial intelligence (SETI) meeting in 1961
- One of the outcomes was an equation to estimate the number of civilizations in our galaxy

The Drake Equation

$$N = R^* f_p n_e f_i f_c L$$

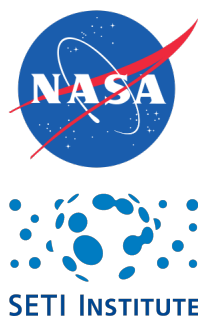
- N is the number of civilizations in our galaxy which we might hope to be able to communicate with
- R^* is the average rate of star formation in our galaxy
- f_p is the fraction of those stars that have planets
- n_e is the average number of planets that can potentially support life per star that has planets
- f_i is the fraction of the above that actually go on to develop life at some point
- f_i is the fraction of the above that actually go on to develop intelligent life
- f_c is the fraction of civilizations that develop a technology that releases detectable signs of their existence into space
- L is the length of time such civilizations release detectable signals into space

Drake Equation

- Designed to stimulate research into these factors, which it did very successfully
- Most of the parameters are guesses, but even conservative estimates yield N 's of 1,000 to 100,000,000
- Much higher than actual known number of 1

Astrobiology

- The scientific study of how life arises in the universe, both on Earth and elsewhere
- Now a major, multi-disciplinary scientific field



Drake Equation Revisited

- Planetary scientist Sara Seager adapted the DE to reflect the search for *any* life

$$N = N_* \times F_Q \times F_{HZ} \times F_O \times F_L \times F_S$$

- N_* = the number of stars observed
- F_Q = the fraction of stars that are quiet
- F_{HZ} = the fraction of stars with rocky planets in the habitable zone
- F_O = the fraction of those planets that can be observed
- F_L = the fraction that have life
- F_S = the fraction on which life produces detectable gas

Drake Equation Revisited

- Much like with the original, the numbers (even with conservative estimates) are huge
- "To my mathematical brain, the numbers alone make thinking about aliens perfectly rational."

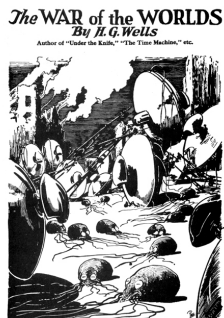


Aliens Throughout History

- Idea of non-supernatural, intelligent beings outside of earth dates back almost 2000 years
- Roman, Arabic, and Japanese tales all feature inhabited planets
- The rise of science-fiction in the late 1800s led to many stories of aliens, most notably...

The War of the Worlds

- HG Wells' story published in 1897
- Detailed invasion of creatures from Mars
- Martians had oily gray skin, large dark eyes, lipless mouth, and a mass of tentacles



The War of the Worlds

- The Martians kidnapped victims and waged war against Earthlings
- Aliens' look was largely inspired by speculative thought about what humans might evolve into
- Massively popular and influential

Aliens Everywhere!

- In the first four decades of the 20th century, science fiction exploded across books, comics, movies, television, and radio
- Early depictions of "aliens" and their actions were highly varied, but began to coalesce into a "typical" alien story

What Aliens Do

- Technologically superior, hostile, traveling in saucer-shaped crafts
- Kidnapped people (women in particular) in remote areas and experimented on them
- Put people into trances or hypnotized them, resulting in missing time

What Aliens Look Like

- By the 1950s, aliens were often humanoid, but with giant eyes and heads but small bodies
- This “typical” alien image and story were very influential and widespread



Exercise #5

Alien Autopsy

As we watch this footage, supposedly taken in Roswell, New Mexico in 1947, employ all the critical thinking tools you have learned about in this course.

What's your verdict?

Abduction!

- By early 1950s there were several published accounts of individuals either being or seeing others abducted by aliens
- Aliens were enormously varied, as were what they did to the “abductees”
- Many appeared to blend sci-fi stories and supernatural beliefs into new stories

Betty & Barney Hill

- In 1961, the Hills were driving home after a vacation late at night
- Noticed some lights in the sky moving oddly, pulled over to get a better look
- Lights then began coming towards them, following them as they sped off

Betty & Barney Hill

- As the lights get closer, they see it is a 100 foot long craft, which then descends to the road in front of them
- They saw humanoid figures in the craft and a door began to open on the bottom, so they sped off in their car, then felt it start shaking
- They suddenly realize they are 35 miles down the road and it's two hours later than it should be

Investigating the Hills' Story

- At the urging of her sister, Betty contacted the local Air Force base, who investigated but found nothing unusual
- Betty started seeking out information on UFOs, including reading *The Flying Saucer Conspiracy* and contacting its author

Investigating the Hills' Story

- Betty soon began having disturbing dreams
 - Showed the "missing time" and how they were taken aboard the craft and examined
- They were then interviewed by a UFO enthusiast and over the next two years gave numerous talks about their experience

Investigating the Hills' Story

- They underwent hypnosis with a psychiatrist
- Both described being taken aboard the craft and displayed high amounts of fear and anxiety during the sessions
- After their work, they reported feeling more at peace and calm about the experience

Media Attention

- In 1965 a Boston newspaper ran a front-page story about the couple and their experience
 - Was reprinted nationally and internationally
- A book, *The Interrupted Journey*, soon followed, with a made for TV movie in 1975
- Became the most famous abduction case

Critical Thinking about Abductions

- The claims are extraordinary, is the evidence?
- Lack of any physical evidence, such as scars from supposed probes
- Only evidence is their testimony before, during, and after hypnosis

Human Memory

- A reconstructive process influenced by our experiences, current emotions, and even social situation – *not* purely recollective
- “...a complex phenomenon involving distortions, deletions, additions, and sometimes complete fabrication.”
- We don’t “make up” memories, but we do often remember things in ways that are not accurate

(Shermer, 2002)

Our Fallible Memory

- Decades of research show certain factors make it more likely we will confabulate:
 - How questions are phrased
 - Being under high stress
 - Co-witness contamination
- True even for “flashbulb” memories

Memory and Hypnosis

- Widespread belief that hypnosis can improve memory
- Research shows that people recall *more* information, but that it is *less* accurate



Perceptual Issues

- We are terrible at recognizing and identifying objects in the night sky
 - Planets, meteors, aircrafts, satellites, and weather have all been reported as UFOs
- The *autokinetic effect* confuses our perception, making still things “move”
- We are very bad at judging speed and distance for objects in the sky as well

CT about the Hills’ Story

- Barney was known to be under high amounts of stress, and they were driving back late at night in a very dark area
- Seeing the bright “moving” object in the sky and it “chasing” them can be explained
- Huge chance of co-witness contamination in the *two years* from encounter to hypnosis

CT about the Hills' Story

- Completely non-falsifiable claims
- Most parsimonious explanation is they misidentified Jupiter and then developed a series of false memories
- This is backed up by Betty's further claims, which became increasingly unbelievable

The Abductee "Formula"

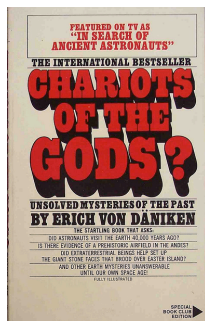
- Five factors common in those who think they have been abducted
 - Very high in magical thinking
 - Episodes of sleep paralysis and hypnopompic hallucinations
 - Have undergone hypnotic regression
 - Very high in absorption
 - Highly familiar with media portrayal of aliens

Betty & Barney's Formula

- Both underwent hypnosis
- Betty only had "abduction" memories *after* reading book on it and dreaming about it
- Betty had many other paranormal beliefs and was likely easily "absorbed" given her later statements about UFOs

Ancient Alien Visitors

- Idea dates back to the 1968 publication of Erich von Däniken's *Chariots of the Gods?*
- More recently resurrected by History Channel's *Ancient Aliens*



Ancient Alien Visitors

- Mostly boils down to *argument from ignorance*
- "I can't think of an explanation for why this looks this way, or how our ancestors could have done this with the technology available to them, so it must be aliens!"
- Claims are easily [debunked](#) in all cases

Modern UFO Crashes

- The supposed 1947 crash of an alien ship in Roswell, New Mexico is the most well known
- Story bears striking similarities to the Hills'
 - No physical evidence
 - Large time gap between event and accounts
 - Massive inconsistencies among eyewitnesses
 - Presence of reasonable explanations

Crop Circles

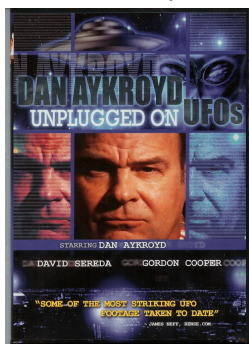


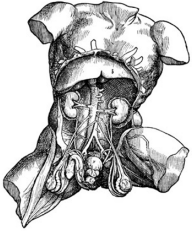
Conclusions

- No evidence for aliens having visited Earth
- Still, it can be the source of wonderful stories, and inspiration for scientific exploration!

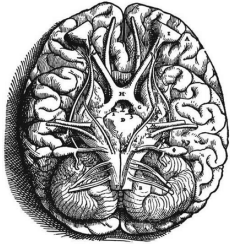


Media Critique #3





VS



“I try not to think with my gut. If I’m serious about understanding the world, thinking with anything besides my brain, as tempting as that might be, is likely to get me into trouble.”

Carl Sagan
