

Have We Been Visited?

Bracewell Probes

Unmanned

Orbit around another star

Wait for civilization to appear

Establish contact

Radio results to Earth

Is there a Bracewell Probe in Solar System?

Long-delayed echoes (1- 30 sec)

Duncan Lunan 1973

→ Epsilon Boötes (Binary star)

→ Contact attempted
now discounted

If use Daedalus technology (fusion)

$R_M = 150$ (need to decelerate)

Visits in the Past?

- In historical times?
- Erich von Daniken is most famous promoter
 - Pyramids, precision stone work
 - Drawings on Nazca plain
 - Easter island statues
 - Note western bias
 - No need for aliens to help with Stonehenge

Ongoing visits?

- Flying saucers (after WWII)
- Neutral term: Unidentified Flying Objects (UFOS)
- Evidence is primarily anecdotal

Reliability

e.g. Night advertising aircraft

< 10% correctly described these

⇒ Unreliable witnesses ⇒ some ordinary objects will fall into UFO category

Statistics of UFO cases

90% of UFOs eventually identified (IFO)

No difference between UFOs and IFOs in time of day, duration, age or gender of witness, occupation, or UFO interest

Both UFO and IFO incidents involve people which, on average, are much more interested in UFOs.

Statistics of UFO belief

“UFOs are extraterrestrial visitors”

40 - 50% of people nationally

<u>This class</u>	Yes (before class)	Yes (after class)
UFOs exist?	68% (65%)	40 - 50%
If Yes, controlled by E.T.?	76% (50%)	45 - 55%

Expect this class to attract more believers, BUT

Austin also seems more credulous

Student polls 1983, 1995

~ 80% Believe in UFOs

Education:

High School or Less

62%

Doctorate or

Working on it

88%

50% believe Government covers up UFO evidence

What we Believe

	1983	1995		
1. ETs are friendly	84%	53%		
			1995	
2. ETs are friendly			males	females
			47%	58%
3. By ethnicity				
	Asian-Am	African-Am	Hispanic	White
Believe in UFOs	35%	61%	77%	81%

Attitudes of Scientific Community

Generally much more skeptical

Repeated studies found no evidence of alien

Connection

2 studies suggested UFOs worthy of further research

1. Allen Hynek

→ Categories

2. Stanford Panel 1997

Peter Sturrock, von Eshleman, Thomas Holzer

“Deserves Scientific Study” but no evidence of

“involvement of an extraterrestrial intelligence”

Categories of UFOs

1. Nocturnal lights

Clear weather, usually 8-11 PM

2. Daylight Disks

Usually disks, some cigar shaped

3. Radar-visuals

Detected by radar as well

4. Close encounters

First Kind - UFO seen closer than 500 feet

Second Kind - Physical effects - burnt vegetation, electrical problems

Third Kind - Observation or encounter with Aliens

A. Hynek

Detection of Alien Spacecraft

Matter-antimatter annihilation \rightarrow γ -rays

We have γ -ray detectors on satellites

1. Military - to watch for nuclear tests
reported γ -ray bursts from space



2. NASA satellite: Gamma-ray observatory (GRO)
has been in orbit since 1991

can detect annihilation of $0.02 \frac{\text{grams}}{\text{sec}} \left(\frac{R}{1\text{AU}} \right)^2$

\Rightarrow No spacecraft decelerating within 1 AU with mass
of ship exceeding 90 grams since 1991.

[Assumes electron-positron annihilation for specific numbers]

Case Study: The Roswell Incident

- 1947 Rancher finds strange debris
 Rumors of “flying saucer”
 Attributed to weather balloon
- 1978 Marcel (Intelligence officer at AFB in 1947)
 Talks to Inquirer → big UFO interest
 Claims of Exotic Matter (originally
 balsa wood, tin foil, rubber, tape, paper)
 Claims (& movies) of Alien Autopsy
 Claims of a Government cover-up

Case Study: The Roswell Incident

~ 1994 -1995

Congressional inquiry → GAO



USAF finally tells the story

Project Mogul

High altitude balloons to “listen” for nuclear bomb
detonations (it did detect 1st Soviet bomb - 1949)

But winds → pushed balloons out of range →
discontinued in 1950

One tracked to near where debris found - then contact lost

Photos of debris match description of Mogul balloons

Secrecy → Conspiracy theories