

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	High School or Less	Doctorate or
Education:		Working on it
	62%	88%

50% believe Government covers up UFO evidence

What we Believe

	1983	1995
1. ETs are friendly	84%	53%
2. ETs are friendly	1995	
	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)
was in orbit from 1991 to 2000

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

\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