

How Should We Really Search for Extraterrestrial Intelligence?

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If contact were made between humans and extraterrestrial intelligence (ETI) on earth or in the solar system, what is the most probably means by which that would occur and how would we know that the interaction had taken place?

THE SEARCH FOR LIFE away from planet Earth has been called a science without a subject matter. For thousands of years, dedicated people, some scientists, some interested enthusiasts, have searched the skies for clues. Scientifically at least, there is no evidence that intelligent life exists anywhere in the universe except on Earth; however, circumstantial evidence would suggest otherwise.

In the early 1950s, Harold C. Urey and S.L. Miller circulated a mixture of methane, ammonia, water vapor, and hydrogen through a liquid water solution and continuously subjected the mixture to an electrical discharge to simulate lightning. Building blocks (e.g. amino acids) of contemporary life forms were clearly demonstrated to be present in the mixture after several days suggesting they were readily produced under what were perceived to be primitive earth-like conditions. If one assumes that conditions for life are universally ubiquitous and that the laws of evolution are equally so then it would be an inane and arrogant prolepsis to infer that we are the only intelligent civilization in the universe. However, science is a fickle mistress and we live in a skeptical age. It is often quoted that spectacular claims require spectacular evidence; unfortunately, the mere hint that intelligent life may exist elsewhere in the universe is perceived by science to be such a spectacular claim.

The first serious attempt to verify the existence of intelligent extraterrestrial life has really only evolved over the last forty years. The “Search for Extraterrestrial Intelligence” (SETI) is an organization first set up in the USA in 1961. Searching for intelligent life elsewhere in our galaxy, the scientists in the organization use radio dishes to collect radio signals from space. Computer analysis selects signals that may have been produced artificially.

It is from SETI that the Green Bank equation (or Drake equation) was derived in an attempt to estimate the number of technically advanced civilizations in the Milky Way galaxy. The equation is complex and expresses mathematically

$$N=N(s)*f(p)*n(e)*f(l)*f(i)*f(c)*f(L)$$

where:

1. N is the number of communicative civilizations in the galaxy;
2. N(s) is the rate of formation of suitable stars in the galaxy;
3. f(p) is the fraction of stars that have planetary systems;
4. n(e) is the number of planets in each system that are suitable for life (that is, that have a “habitable zone”);
5. f(l) is the number of these planets on which life arises;
6. f(i) is the fraction of these planets where intelligence arises;
7. f(c) is the fraction of these planets on which technical civilization capable of communicating emerges;
8. f(L) is the fraction of the planetary lifetime during which the civilization exists.

So far SETI has found no reproducible trace of life elsewhere in the Solar System. However, the reception of the ET equivalent of Super Bowl by radio telescopes—huge, curved dishes that point toward the sky is not a proven science. The dish collects and focuses radio waves, just as a mirror focuses light in a reflecting telescope yet no one has succeeded in orbiting a radio transmitter around Alpha Centauri and picking up its signals here on earth. Conversely, no one has sent a receiver to the same star and succeeded in picking up some long forgotten billboard chart show. Being an unproven science does not mean SETI is a wasted effort; however, the resources could possibly be put to better use.

What if evidence of an ET civilization were found? It is a romantic idea that SETI picks up a reproducible signal from an ET civilization, informs the UN who then make a momentous announcement that brings the people of the world closer together. Indeed, the knowledge that we are not alone no doubt would prompt us to forget our petty inter-tribal conflicts that have inhibited our intellectual evolution. One need look no further than the destruction of The Great Library of Alexandria and its accumulated treasure of knowledge to realize that the long term good of mankind and conflict are incompatible.

Notwithstanding that SETI is an unproven science and even if contact were made with an ETI in this manner, the time lags in sending and receiving messages over interstellar distances would present an enormous technical challenge. Depending on the length of time between exchanges it could without doubt take several centuries before meaningful discussions were set up.

What would constitute reliable evidence? There exist the following problems in investigating alleged intelligent ET Phenomena

1. The ETI uses materials and systems similar to what we have on Earth, hence their handiwork cannot be distinguished from our own.
2. The ETI uses materials and systems not available on Earth; however, we lack the techniques to detect them.
3. The ETI use materials and systems way beyond our technology (or not available on Earth); however, we have the techniques to detect them.

The first two protocols are nebulous in that we cannot for example say for sure whether an ETI or just sheer Human ingenuity were involved in some of the stunning pre-conquistador South American architecture or whether the famous “wow” signal of SETI fame was sheer coincidence. However, if modern day technologies were able to detect and demonstrate incredibly advanced technology in the confines of our solar system, this would be a first step toward confirming the existence of ETI. The question would remain as to whether the ETI was intrasolar (i.e. from a planet orbiting our sun or an associated moon) or extrasolar (from another star system). So if evidence for an advanced technology were found to exist using currently available technology, would it be only natural that the governments of the world would unite to make a historic announcement confirming first contact?

There is ample historical precedent to suggest this is an extremely unlikely scenario. The UK government at least would prefer to keep information or evidence of phenomena showing design and performance parameters well in advance of our own capabilities well out of the public gaze. This would be especially convenient if the phenomena only manifested itself on rare occasions and did not attempt to interact to any great extent with the general populace. Some of these historical precedents have been the subject of a recent report passed on to the UK Parliamentary Select Committees on Defence and Science & Technology. The result of extensive research into historical archives at The Public Record Office, the report can be viewed at The Royal Astronomical Society Library in Piccadilly, London (Burlington House, Ref Qy 119). Taken from the full narration, the following case histories demonstrate quite clearly that UK airspace has on occasion been penetrated by unidentified intelligently controlled aerial craft with design and performance parameters far in excess of any known technology:

1. The West Freugh Incident. Cast your mind back if you will to Thursday, 4th April 1957. Tom Finney of Preston North End FC had just been voted Footballer of the Year and the recently elected MacMillan government had come to bitter conclusion that the sun was setting on the British Empire. Consequently, it was announced that day that there was going to be a radical change in the defense policy of the UK, more reliance was going to be placed on a nuclear deterrent and large cut backs would be made in conventional forces; especially those serving overseas.

With all the talk over the defense cuts, it was small wonder that little attention was being focused on incredible events that were happening near Stranraer in South West Scotland. On the morning of the 4th, radar operators at the Ministry of Supply, Bomb Trials Unit, West Freugh picked up an unusual response from an almost stationary object. The first return was picked up on the screen of a radar at Balscalloch. Although its range remained appreciably constant for about ten minutes, its height appeared to alter from about 50,000 to 70,000 feet. A second radar was switched on and verified this return, as the unidentified flying object was detected at the same range and height. The radar sets used were capable of following the objects automatically and the information was obtained in the form of polar coordinates. These could then be converted to give plan position indication and were printed out onto a plotting board via an electronic pen, the heights were read off a meter. The unidentified object was tracked on the plotting table and after ten minutes, it moved in a northeasterly direction with a gradual increase in speed (70 mph groundspeed at 54,000 feet). Further confirmation of the unidentified object came from a radar station twenty miles away from Balscalloch which was equipped with similar height/position monitoring equipment. After the radar return had traveled about twenty miles, it did a sharp turn and proceeded in a south-easterly direction whilst increasing its speed. The Balscalloch radar tracked an object at 50,000 feet moving at a speed of 240 mph while the other station tracked four objects at 14000 feet and 4000 yards line astern from each other. The Balscalloch radar also picked up these returns. It was noted by the radar operators that the sizes of the echoes were considerably larger than would be expected from normal aircraft. In fact they considered that the size was nearer to a ships echo.

In the previous December, a memo marked SECRET had been issued by RAF HQ No 11 Group (Ref. 11 G/S.1803/7/Air Int.) Paragraph 3 of this memo stated:

It will be appreciated that the public attach more credence to reports by Royal Air Force personnel than to those by members of the public. It is essential that the information should be examined at Air Ministry and that its release should be controlled officially. All reports are, therefore, to be classified CONFIDENTIAL and personnel are to be warned that they were not to communicate to anyone other than official persons any information about phenomena they have observed, unless officially authorized to do so.

Despite these standing orders, it appears that the *Evening Standard* must have gotten a handle on the story as a reference was made to West Freugh in the Saturday edition (6th April). The radar returns were, according to an Air Ministry spokesman, attributable to a weather balloon that had been sent up from Aldergrove airfield in Northern Ireland. This rather mundane explanation seems to have been accepted, the reporter had his story and the case was to all intents and purposes closed.

By contrast to the explanation given to the press, it would be interesting to see what the Deputy Directorate of Intelligence thought of this incident. In a report dated the 30th April 1957 (Ref. DDI (Tech)/C.290/3/), the following observations were made:

1. It is deduced from these reports that altogether five objects were detected by the three radars. At least one of these rose to an altitude of 70,000 feet while remaining appreciably stationary in azimuth and range. All of these objects appeared to be capable of speeds of about 240 mph.

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Nothing can be said of physical construction except that they were very effective reflectors of radar signals, and that they must have been either of considerable size or else constructed to be especially good reflectors.

2. There were not known to be any aircraft in the vicinity nor were there any meteorological balloons. Even if balloons had been in the area these would not account for the sudden change of direction and the movement at high speed against the prevailing wind.
3. Another point which has been considered is that the type of radar used is capable of locking onto heavily charged clouds. Clouds of this nature could extend up to the heights in question and cause abnormally large echoes on the radar screens. It is not thought however that this incident was due to such phenomena (author's note—clouds, like balloons would also be unlikely to move against prevailing winds at high speed).

It is concluded that the incident was due to the presence of five objects of unidentified type and origin. It is considered unlikely that they were conventional aircraft, meteorological balloons, or charged clouds.

It is interesting to note that the second observation states that there were no meteorological balloons in the vicinity at the time in question that contradicts the version of events given to *The Evening Standard* by an Air Ministry spokesman. Was this a blatant cover-up of the facts? Certainly the Deputy Directorate of Intelligence were unhappy that the radar incident fell into the hands of the press and this is alluded to in a secret memo (Ref DDI [Tech]/S290/). However, even more damning were the draft notes prepared for Mr. George Ward, The Secretary of State for Air. A Parliamentary Question was tabled by Mr. Stan Awberry, a Labour MP for one of the Bristol constituencies on Wednesday, 17 April, 1957 (Hansard, col 206). The question read:

To ask the Secretary of State for Air, what recent investigations have been made into unidentified flying objects; what photographs have been taken; and what reports have been made on the subject.

Extracts from the Ministerial notes prepared for George Ward read:

1. The Ministry of Supply Bombing Trials Unit at West Freugh, Wigtownshire reported a radar sighting made on 4th April of an object which was tracked 36 minutes, continually increasing in speed whilst losing height. Enquiries so far made reveal that no service or commercial aircraft was in the vicinity at the time. It is possible that the object was a private aircraft, and enquiries on this point are still being made. The object could not have been a balloon since it was moving against the wind.
2. A reference to this report was contained in the "Evening News" and "Evening Standard" on 6th April (cutting attached). If S. of S. is asked questions on this point, it is suggested that the reply should be on the following lines:

That report is still being investigated, and the cause has not yet been established. It may well have been a private aircraft.

You will notice from these draft notes that the Minister was not informed of:

1. The size of the object
2. The appreciable height
3. The fact that it was hovering

Also, no mention was made of objects; was there a cover-up? Certainly if you consider the withholding of information from a Government Minister and the blatant misrepresentation of facts to the press as a cover-up then clearly, this was indeed the case.

Notwithstanding the fact that a cover-up was perpetrated, it would be an absurd anachronism to apply the moral hindsight of the 1990s to the Cold War horrors anticipated by the military establishment in the 1950s. We must not forget that in April 1957 the world was also becoming a dangerous place to live as Britain was one month from exploding its first H-bomb over the Pacific and the USSR was about to announce that it had developed long range missiles capable of delivering nuclear warheads.

2. The St. Margaret's Bay Incident. It was the 1st May, 1957, once again, the Middle-East was very much in the headlines. Having survived an attempted coup, a youthful King Hussein of Jordan was happy to accept \$10 million of U.S. aid in order to squelch the influence of communists and other extremists within his country and establish a more moderate and pro-Western monarchy. In Washington, The House of Representatives had just passed a controversial (and very much diluted) Civil Rights Bill which was to be approved by The U.S. Senate the following August. Then in September, the standoff at Little Rock occurred, the rest is of course, history.

These were not the only headlines in the papers that first day in May—"RAF Chases 900 mph Mystery Object" screamed *The Daily Express* to the commuters on the trains; "RAF hunts The Thing," yelled *The Mirror* to the factory workers on their tea breaks; "Radar Station's Report of Flying Object" cautioned *The Daily Telegraph* to teachers and bank managers. *The Daily Sketch* and *The Worker* also carried similar headlines. Clearly, something incredible had happened.

The actual exclusive for the story was obtained by the *Evening News* and published the night before. Apparently, senior Air Ministry officials in charge of Britain's radar defense network scrambled a squadron of Javelin interceptors from RAF Odiham, Hampshire in response to some 1000 mph anomalous radar returns. The incident had occurred the previous Monday (29th April) and the aircraft were put up at 8:50 pm. They were homed on to the objects near St. Margaret's Bay in Kent; however, they failed to make contact due to the excessive speed of the unidentified object.

This was quite an incredible story not least due to the fact that it made so many major national newspapers but also, because of RAF standing orders, it is incredible that this story got out at all! RAF personnel were under instruction not to divulge details of unidentified craft with design and performance parameters in excess of cutting edge technology. Yet here was an incident involving a craft with a speed in excess of anything attainable by the then state of the art, and what was more, just like West Freugh, penetrating UK airspace with impunity.

So what really happened on the evening of the 29th April 1957? At 08:07 pm that evening, the Duty Display Radar Controller at RAF Ventnor, Isle of Wight received a telephone call from an astronomer who lived at nearby Shanklin. A number of civilians had noticed a very bright pinpoint of light to the south-east, elevation 75°, height, approximately 30,000 feet. Through x8 magnification field glasses, there appeared to be a secondary object; however, the main one was metallic with light emanating from the center and perimeter. The size of the object was variable. Skeptics of UFO stories often relate sightings of stationary lights to misidentification of Venus. In this incident, the sightings were not astronomical since the Duty Display Controller had the presence of mind to contact RAF Beachy Head who subsequently confirmed two stationary returns in the Shanklin area. Apparently, the returns were described as being similar to angels, which is a term for a little understood atmospheric phenomena relating to ionic inversion. By 08:20 pm, Beachy Head reported that one object had faded on the radarscope, a fact later confirmed by the civilian observers (RAF Ventnor, after repeated attempts got through to the astronomer at 09:10 pm). At 9:00 pm, it would seem that alarm bells were ringing as a

third RAF station at St. Margaret's reported two fast tracks heading in a southwesterly direction toward the Isle of Wight. Although unable to get a visual, RAF Ventnor were able to track the unidentified objects by radar on advice from Beachy Head and gave a speed of 750 to 800 knots. This is equivalent to a speed of 860 to 920 mph and it would seem that the initial newspaper estimates of 1000 mph were a little exaggerated. We will see later the significance of this exaggeration.

What of the interception? Did the RAF really try to shoot down a flying saucer? The truth is a little less sensational than that. Certainly, RAF Odiham did not scramble a squadron of Javelins and this fact is borne out by a secret telex message transmitted to DDI Tech from the RAF Station.

Nevertheless, the telex message makes interesting reading and I have recreated the text in full:

SECRET A0166 (AIR MINISTRY FOR DDI (TECH) ODIHAM REPORT ON INTERCEPTION OF UNIDENTIFIED OBJECT ON THE NIGHT OF 29TH APRIL AT 2038Z TWO JAVELIN AIRCRAFT MISSION 48 AND 49 TOOK OFF FROM ODIHAM TO CARRY OUT PRACTICE INTERCEPTIONS PD AT APPROX 2105Z HOPE COVE CALLED OFF MISSION 48 TO INTERCEPT AN UNIDENTIFIED OBJECT AT 12 OCLOCK RANGE 12 MILES AT 50000 FT MISSION 48 WAS THEN AT A POSITION ABOUT SIX MILES SOUTH EAST OF YEOVIL AT 45000 FT HEADING 010 (M) ON REACHING 48000 FT MISSION 48 WAS TOLD THAT THE OBJECT WAS THEN AT 12 OCLOCK 10 MILES PD REACHING 50000 MISSION 48 WAS TOLD THAT THE OBJECT WAS NOW IN THE DARK AND THAT HE WAS TO RETURN TO BASE PD IT WAS A CLEAR NIGHT BUT THE CREW SAW NOTHING PD THE NAVIGATOR WAS UNABLE TO PICKUP ANYTHING ON HIS AI DURING THE PRACTICE INTERCEPTIONS HE HAD MADE PICKUPS ON HIS PLAY MATE AT 14 MILES PD THE AIRCRAFT SUBSEQUENTLY LANDED AT ODIHAM AT 2130Z.

In conclusion, it is clear from historically authenticated evidence that something unusual was in our skies on the night of April 29, 1957. Unusual metallic aerial phenomena were witnessed by several people near Shanklin and these observations were backed up by radarscope evidence. Furthermore, fast moving objects were seen on radar on an apparent rendezvous course with the shape-shifting Shanklin craft. The newspaper reports on this incident were sufficient to generate a Parliamentary question, Mr. Frank Beswick (Labour-Uxbridge) enquired:

To ask the Secretary of State for Air, what was the nature of the aircraft or other object sighted on the radar air defense screens on Monday night and which occasioned the dispatch of aircraft of Fighter Command.

A week later, another shot across the bows came from Major Patrick Wall (Conservative-Haltemprice):

To ask the Secretary of State for Air, how many unidentified flying objects have been detected over Great Britain this year as compared with previous years; and whether the object picked up on radar over the Dover Straits on 29th April has yet been identified.

The Deputy Directorate of Intelligence had actually prepared briefings for the Secretary of State; however, it is interesting to note that a lot of briefing was going on behind the scenes. In a document marked SECRET, (File AIR 20/3920, Ref DDI [Tech]/S290/3A), I quote the following statement:

It is unfortunate that the Wigtownshire [West Freugh] radar incident fell into the hands of the press. The two other radar incidents have not been made public and reached us by means of

official secret channels. We suggest that [Secretary of State] does not specifically refer to these incidents as radar sightings.

Pausing for a minute and reflecting on that last sentence; why would the technical intelligence department not want these incidents to be referred to as radar incidents? It does not take a Ph.D. to realize that radar returns are physical evidence, and whilst radarscopes can give spurious readings, these faults can be quickly identified by a trained technician. If these returns are seen by more than one radar as was the case with St. Margaret's Bay, chances are, they represent a genuine object. The underlying current was that the post-war generation of the 1950s had a lot of faith in radar as it had won us the Battle of Britain. They would have believed more in the physical reality of the unidentified craft than the possibility that the radars were at fault and this was in my opinion the reason for the omission. The military authorities would have been weary of generating panic, especially if people started thinking the objects were of Soviet origin.

You will note that Major Wall's question enquired about previous years' incidents. This was considered a supplementary question in the brief prepared for the Minister and he was advised to draw attention to the fact that very few of the unusual objects reported remain unidentified for long. Had George Ward seen the unexplained incidents of the previous year outlined on the Intelligence Minute Sheet, he may well have been very concerned. The minutes included brief descriptions of:

1. Radar sighting by a navigator on a Vulcan aircraft.
2. An unusual object on Lakenheath Radar which moved at between 2000 and 4000 knots. Venom scrambled in unsuccessful intercept.
3. Radar sighting at Weathersfield, momentary contact made by aircraft scrambled to investigate.
4. A visual submitted by a member of the Royal Observer Corps.

A further brief description was made of an object seen on the screen at RAF Church Lawford which accelerated to a speed in excess of 1400 mph from a stationary position. The radar was not at fault since it was giving a standard return for another aircraft in the vicinity.

This still left the MoD with the problem that the St. Margaret's Bay radar returns had been reported to the press. At West Freugh, the explanation given was a Weather Balloon. Clearly, 860 mph was a little excessive for this excuse. I will now hand you over to the Secret Ministerial Briefing Papers prepared for the Secretary of State for Air.

To summarize the brief:

1. The previous year's reports were not included.
2. Church Lawford was mentioned; however, it was played down to use MoD terminology in that no mention was made of the object's acceleration and contradictory to the minute sheet, it was implied that the equipment may have been faulty.
3. RAF Ventnor did pick up two returns on the night of the 29th April; however, the time was 10:00 pm (not true, it was 9 pm, furthermore, the two intercepting Venom's had landed by 9:30 pm)
4. They were high speed returns (750 knots) picked up by RAF Ventnor; however, they were reassessed to be traveling at 600 knots by Hope Cove radar near Land's End. Note, this was a return at 10:00 pm traveling Westward. RAF Ventnor's returns were traveling South Westerly at 9:00 pm on an apparent rendezvous with the other object at Shanklin Bay.

Apparently, there were sixteen hunters on exercise between 9 and 10:30 pm on the night of the 29th. The minister was essentially told that these were the mystery objects. If he was asked about the speed, he

was instructed to say that the press reports of 900 to 1000 mph were in excess of those reported by the Control and Reporting System (Ventnor reported 860 to 920 mph, still faster than anything we had then). Furthermore, no mention was made of the stationary objects in Shanklin Bay, nor was there any mention of the fact that Ventnor had been alerted to the returns by radar at RAF St. Margaret's.

Having correlated the information with documents from a second file AIR 20/9994 it became quite clear that this brief was a cover-up, this is amply demonstrated in the answers that Major Wall and Mr. Beswick received (Hansard, 15th May 1957, 393/4):

Five flying objects reported this year are as yet unidentified compared with six last year, none in 1955, and six in 1954 (note: no mention of radar sightings!)

The object sighted in the Channel on the 29th April turned out to be two of a large number of Hunters of Fighter Command engaged on a training exercise. Their movements as observed on radar were somewhat unusual and aroused the suspicions of the radar defenses.

It is wrongly assumed by the scientific community that radar sightings, while reliable in certain respects, do not provide the information necessary to discriminate between physical objects and such natural phenomena as meteor trails, tracks of ionized gas, rain, or thermal discontinuities.

Furthermore, several effects can give false radar echoes: electronic interference, reflections from ionized layers or clouds, and reflections from a region of humidity (e.g., a cumulus cloud). Trained radar technicians can quite readily distinguish between physical objects and natural phenomena especially when the following verifications are included:

1. Radar Sighting backed up by visual contact (e.g., St. Margaret's Bay and RAF Weathersfield)
2. Radar Sighting of objects on screen giving normal plots for other aircraft in vicinity (e.g., RAF Church Lawford)
3. Sightings backed up by multiple radar sites (e.g., RAF West Freugh and St. Margaret's Bay)
4. Aerial Phenomena show intelligent maneuver such as flying in formation (e.g., RAF West Freugh)

Whilst the radar sightings show ample evidence for aerial craft with design and performance parameters far in advance of cutting edge technology, the corroborative and expert testimony of pilots both civilian and military who similarly witnessed structured unidentified craft should also be taken seriously by a skeptical scientific community. Of particular note is the Mandatory Occurrence Reporting Database held by the Civil Aviation Authority, this contains a number of reports on near misses between unidentified flying objects and civilian airliners. A classic incident involved a Kondair Trislander in 1984 that was struck in mid-air by an unidentified flying object. Although a civilian craft, the metallic fragments found in the hull were taken to the Defence Evaluation Research Agency at Farnborough. No information was volunteered on the metallurgical analysis of the fragments despite repeated attempts by some interested parties.

The obvious question is why, despite all the evidence now available, is the scientific community still so skeptical? There are probably a number of answers:

1. The Robertson Panel Report of the early 1950s recommended that sightings and the subject be debunked in general due to the possibility of communist exploitation.
2. A lot of cults and sects grew up around the subject.
3. A lot of charlatans were making extravagant claims.

4. A large percentage (95 to 99%) of sightings had a prosaic explanation.
5. The Condon Report published in the late 1960s said that further investigations were unnecessary.

The fact of the matter is, there are far more good quality reports of unidentified flying object than there are radio signals coming from ET civilizations and there are more opportunities to study unidentified aerial phenomena (which are on our doorstep) than there are opportunities to receive out-of-date signals from an ET civilization several light years distant, who may have stopped looking for a response by the time the signal reached us anyway.

The obvious conclusion to be drawn is that yes, unidentified aerial craft with highly advanced design and performance parameters precluding them from having been fabricated by any known civilization are a real phenomena—the only real question that should be on people’s lips is “Are we really dealing with an advanced ET civilization?” or just dealing with a hitherto undiscovered, yet disproportionately advanced earth civilization? Until we meet the pilots of these unidentified aerial craft, we cannot say for sure.

The biggest barrier to contact between the perpetrators of these unidentified aerial phenomena (and possibly an ETI) are skeptical scientists who debunk the subject based on the unsubstantiated claims of a minority of unqualified people. This pattern is now so ingrained that even when qualified scientists and historians present evidence, they are tarred with the same brush.

Ultimately, it is down to the leadership of the major industrialized countries to break this current mentality by acknowledging the existence of unidentified aerial phenomena. This in turn would prompt industry and academia to sit up and take note. Government sponsored teams of scientists given access to all available information would not be subject to the same degree of ridicule as other groups and would undoubtedly come up with a different conclusion to that of the Condon Commission since a lot more information has now been made available.

Q: Please design one particular research project or a whole set of research projects that focus on how to detect or verify the presence of ETI. The research design should be both scientifically rigorous and innovative.

Acceptable levels of proof for the existence of ETI or at least some form of non-human alien intelligence are probably already in existence. If all the files on unidentified aerial phenomena (from reliable sources such as pilots and radar operators) throughout the world were pooled, several designs of craft would probably become apparent. For example, a triangular-type craft the size of a Boeing 737 caused aircraft of the Royal Dutch Airforce to be scrambled in March 1990, and similarly, was witnessed by RAF personnel at two stations three years later. These incidents were attested to by a civil servant in the UK Ministry of Defence who actually worked at the MoD UFO Reporting Desk. Again, this is further evidence of mainstream science’s almost criminal apathy on the subject. Here Nick Pope, an MoD expert on the subject of aerial phenomena is actually standing up and saying these things exist yet nothing is done! One of the reasons for this probably stems from the lack of backing Mr. Pope has had from the MoD. A strong proponent of the ET hypothesis of unidentified aerial phenomena, he is undermined by the official line that “UFOs are of no defense significance, therefore the MoD has no further interest in these alleged phenomena.”

Defense significance or not, the declassification of all UFO files (and there are many in the UK on the PRO Eureka Database still awaiting release) would awaken the curiosity of many a slumbering academic and would be a positive step to confirming the existence of ETI.

The need for government to act puts the subject of aerial phenomena into the political arena. In this forum, the subject of UFOs is a hot potato and a large number of questions have been tabled in the UK

Parliament in recent years. Currently, the Cabinet Office has the responsibility for taking forward the government's manifesto pledge to introduce a Freedom of Information Act (FOIA). The timetable involved the publication of a White Paper in December 1997 followed by a period of open consultation leading to a draft Bill that was recently debated. Representations have been made to the MoD to make UFOs a special case with the forthcoming FOIA. Furthermore, recommendations have been made to the UK Scientific Steering Committee that a sectoral panel be set up under The Department of Trade and Industry's Technological Foresight initiative to investigate aerial phenomena in more detail. This is in addition to the report passed on to the Select Committees mentioned earlier.

If the ambitions of the forthcoming FOIA are fully realized, scientists will undoubtedly have an important role in the analysis of UFO incidents. The bitter truth of the subject at the moment is that there are very few scientific precedents on which to base detailed studies and there is clearly a lot of potential for further development in this field.

Classically, UFO related phenomena fall into four categories, these being Close Encounters of the 1st Kind (CE1), 2nd Kind (CE2), 3rd Kind (CE3) and 4th Kind (CE4). These will be described in turn:

1. CE1

CE1 incidents usually refer to sightings of unidentified craft seen at long distances or at great height and probably account for the vast majority of sightings. The most obvious means of detection are physical such as radar and photographic. Indeed, on a historical note, the MoD have employed the services of Kodak to examine films and photographs of UFOs as well as equipment. Regrettably, even the best analytical techniques cannot deter the determined hoaxer. A case in point was that of a fifteen-year-old boy who had the MoD baffled by a photograph of a "squadron of flying saucers" allegedly taken on the 28 March 1966. Convincing as the photograph was, the young man in question admitted to its fraudulent nature some years later, apparently to ease his conscience. How many other consciences out there that are in need of relief is open to question.

One of the best-documented analyses of a photographed aerial disc was conducted on a second-generation negative taken on 4th September 1971 over the region of Arenal, Costa Rica. The analysis included:

1. Geographic Locale—including sun angles and shadow to confirm times
2. Digital Enhancement
3. Development of film on various contrast papers
4. High Reverse Contrast Imagery to measure relative densities between object and background

The photographs of the disc and the concluding arguments were quite impressive as were the referee's comments suggesting that the disc may have been caused by a flaw in the photographic emulsion. The authors of the article concluded that an unidentified, opaque, aerial object was captured on film at a maximum distance of 10,000 ft. In this particular case, hoaxing was not an issue as the photograph was taken by a government geographical survey team.

Suspect as photographic evidence may be, if governments are in possession of photographic (still or moving picture) manifestations of aerial phenomena, they have a moral duty to share these details with the scientific community.

Perhaps a better way of observing CE1 incidents would be to develop and utilize equipment capable of measuring microwave and other spectral emissions at distances up to 10 miles. For example, if unusual gasses such as deuterium were to be detected in emissions of unidentified craft, discussions as to the nature of propulsion could be initiated. Databases based on spectral fingerprints could also be generated.

There would be technical problems to be surmounted, for example metallic objects would most likely absorb the vast majority of microwaves.

A case in point that could have benefited from this approach would have been the Wash Incident witnessed for a total of eleven hours by police officers, civilian aircrew and the crew of a tanker on the 5th of October, 1996 off the Skegness Coast (South West of England). The sighting was also backed up by returns at three RAF radar stations. The MoD's official conclusion that the incident was due to a combination of a church steeple called The Boston Stump and the planet Venus was highly suspect to say the least although high buildings can give radar returns. Nevertheless, trained radar operators would probably be aware of this possibility and it would be a matter of grave concern if the crew of a tanker, or any ship for that matter, were unable to recognize the planet Venus. Suggestions to the MoD that this incident highlighted the need for some form of spectral fingerprinting however, went completely unacknowledged.

Perhaps the best attempt to date to characterize CE1 type sightings was the 1984 Hessdalen Project. Hessdalen is a valley in the middle part of Norway, south east of Trondheim and about 18 miles north west of the town of Roros. Lasting only a month, the project did not really have an opportunity to draw any firm conclusions as to what the Hessdalen phenomena was; however, what it did do was set a precedent as to how UFO investigations should be conducted. In particular:

1. Locate an area where there is extensive UFO activity reported.
2. Use a team of between 10 and 20 technicians.
3. Use cameras with gratings for spectral analysis.
4. Use seismographic instruments as it has been postulated that some unidentified aerial phenomena may be the result of underground movements, tectonics, etc.
5. Have a field radar available (the one used at Hessdalen had a range of 33 Km).
6. Instrumentation for the intensity and spectral analysis of broadband radiowaves (150 KHz to 1250 Mhz).
7. Magnetometer to measure for any magnetic fluctuations in the vicinity of the phenomena.
8. Use of lasers to elicit response from aerial phenomena (a Modell 155, 630 nm laser from Spectra-Physics, Inc. was used at Hessdalen).
9. Use of Geiger counters.
10. Use of IR Viewers (night vision scopes).

2. CE2

CE2 incidents usually refer to sightings of unidentified craft interacting with their environment, usually leaving some form of "calling card" such as scorch marks or imprints on the ground. This would allow for all manner of chemical tests to be conducted in the vicinity including:

1. Radiographic Measurements
2. Surface Water Analysis
3. Analysis of Plant Material
4. Soil Analysis

Undoubtedly, the most famous CE2 case in the UK occurred at Rendlesham Forest on the nights of 26–29 December 1980. The contents of Lt. Col. Charles Halt's report still make chilling reading, even today, eighteen years after the event. Skeptics of this incident still like to imagine patrols of confused American soldiers wandering round Rendlesham Forest thinking a lighthouse was a UFO. Of course, the

skeptics were blissfully unaware that lighthouses do not under any circumstances fly or leave traces of radioactivity.

One small anomaly from Lt. Col. Charles Halt's memo on the Rendlesham incident that was not established was whether or not the elevated beta/gamma readings were induced from a stronger source that had been since removed from the contaminated area or as a result of radioactive material spilling from the unidentified craft.

It is a shame that details of the Rendlesham Forest Incident did not reach the public domain until two and a half years later as detailed site analysis would undoubtedly have told us a lot about the incident.

Ten years later, some cursory tests were done on the soil in the landing area. Despite being a little too late, the results nevertheless made interesting reading. In addition, the analysis could serve as a future precedent for chemists wishing to investigate CE2 sites. The control samples were taken at the landing site and at 50 and 100 ft. distances from the landing site; the results are summarized thus:

1. The soil from the affected area had a lower field moisture content than the control samples.
2. The affected soil from the landing site was also resistant to rehydration.
3. Under the microscope, the affected soil had higher degrees of silicate or glass globules than controls, indicating that the sand had been fused to form these tiny glass beads.
4. The landing site soil showed no microbial growth of any type whereas the control did.

Had the incident been made public earlier, a much more detailed evaluation of the site could have been undertaken. For example, ion exchange chromatography and neutron activation analysis could have given an indication of N-content between sample and control, atomic absorption spectroscopy could have indicated differences in trace metals between sample and control. Given the undeniable fact that intelligently controlled unidentified aerial craft with capabilities far in excess of current state of the art technology have on occasion penetrated UK airspace (according to the Public Record Documents), clearly, a major opportunity was lost. This is the bitter, tragic, and inevitable consequence of information suppression and censorship.

Had scientists been allowed on the contaminated landing site at Rendlesham Forest, studies could have been carried out on the plant life. Halt actually stated that the near side of a tree also showed elevated beta/gamma readings. There is a very good scientific precedent which utilizes biochemical traumatology as a tool for identifying actual stresses elicited by unidentified sources and this too would have served well at Rendlesham.

Following the testimony of a 1981 UFO landing at Trans-en-Provence in France, samples of a wild strain of Alfalfa (*Medicago minima*) were collected at the epicenter and at various increasing distances from the trace left on the ground. The first samples were collected by the local Gendarmerie four days after the event and a second batch was collected thirty-six days later by a team of technicians from the French National Space Research Centre. An additional batch of similar samples collected two years after the event were then used as an *a posteriori* control of the natural variability of the same area. Extensive biochemical determinations were carried out on the plant samples and included (i) photosynthetic pigments, (ii) free carbohydrates and (iii) free amino acids. Statistically significant results were observed by plotting concentrations versus distance from the epicenter. It also appeared that the unidentified source elicited biochemical effects as a reciprocal function of the distance from the source. Lack of any visible trauma on the leaves such as charring or burning indicated a possible radiative source. Ultimately, the study concluded that:

1. Something unusual did happen

2. That the influence of the unidentified source decreased with increasing distance from the epicenter.
3. Symptomatic changes in vegetation could be monitored at CE2 sites and compared with the effects of known radiative sources.

A good analogy for investigating a CE2 site based on the above caveats would be to ask, if this had been a major chemical spill or a major spill involving radio isotopes, how would I investigate the site and what traces would I look for? This concept could be referred to as the Radioactive/Chemical Spill Model Approach.

3. CE3 and CE4

Close Encounters of the Third Kind refer to an actual encounter with the occupants of a UFO whereas Fourth Kind Encounters refer to the so-called “alien abductions.” These are highly contentious issues that have been extensively studied by Prof. John E. Mack of Harvard University and his conclusions that this phenomena is a real one are quite incredible. Forensic and medicinal chemistry can and should have an important role in this field, although that is currently not the case. I am not aware of any medical facilities in the UK which accept and monitor alleged abductees. Given that UFOs were (and still are) quite mistakenly considered highly dubious, it would be the height of folly to repeat the mistake.

Concluding Remarks

Speculation over the last fifty years that governments have been aware of intelligently controlled aerial craft with design and performance parameters far in excess of cutting edge technology has been confirmed with the release of a large number of documents from such bodies as the Public Record Office. Undoubtedly, there are more documents in the pipeline. Although speculation as to the origins and intentions behind this phenomena is premature, it is clearly the case that the general exclusion of mainstream science from this subject area has led to a woeful lack of scientific understanding and development which has not necessarily been in the best interests of mankind.

The question often arises as to what are the acceptable levels of proof required by science and society for the existence of ETI on earth or in the solar system. Although there is no evidence available that unidentified aerial craft reported from some of the more credible sources are of ET origin, the craft in themselves are certainly alien to our current understanding of flight and aerodynamics and switching resources to investigating this incredible subject would be a most worthy pursuit. Ultimately, funding into unidentified aerial phenomena would have to be instigated by the governments of the major industrialized nations, and this in itself would give the subject the credibility it needs. To further convince science and society, the ensuing investigations would have to take the form of

1. Declassification and retrieval of all information relating to UFOs
2. Extensive investigation into CE2 incidents on a “day after” basis using the Radioactive/ Chemical Spill Model Approach
3. Investigation of CE1 “UFO Hotspots” using the Hessdalen Model Approach
4. Taking seriously the claims of “alien abduction,” carrying out proper medical examinations on alleged abductees and setting up an international database to compare notes (whilst maintaining patient confidentiality).

There is probably enough evidence available now to infer an ETI is behind some incidents involving unidentified aerial phenomena. World governments showing leadership and sponsoring the above investigations would probably convince the more sceptical minds in science and society that intelligent life in the universe is the norm rather than the exception.

The following UFO-related documents may be viewed at or ordered from The Public Record Office, Ruskin Avenue, Kew, Richmond, Surrey, TW9 4DU (Tel. 0181-876-3444):

AIR 16/1199	AIR 20/7390	AIR 20/9320	AIR 20/9321	AIR 20/9322
AIR 20/9994	PREM 11/855	AIR 2/16918	AIR 2/17318	AIR 2/17526
AIR 2/17527	AIR 2/17982	AIR 2/17983		

All UFO-related post-1967 documents generated by the MoD are currently classified, including Rendlesham Forest.

The following UFO-related Mandatory Occurrence abstracts can be obtained from the Civil Aviation Authority Safety Regulation Group at Aviation House, Gatwick Airport South, West Sussex, RH6 0YR (Tel. 01293-573662):

7802646F	7904369X	8003311C	8100542C	8201614C
8201671B	8302525A	8402680D	8404256G	8404325C
8904477X	9101151E	9102447A	9201286H	9701145B

UFO-related airmiss report numbers 75/91, 7/94 and 2/95 can be obtained on request from The Dept of Transport, Zone 2/26, Great Minster House, 76 Marsham St, London SW1P 4DR (Tel. 0171-271-4941).

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Recommended Reading

1. *Beyond Top Secret* by Timothy Good (Pub. Pan Books, 1996)
2. File PREM 11/855, 28 July 1952. Available from Public Record Office, Kew
3. AIR 16/1199, Flt Lt J Kilburn's Memo to Coastal Command Det., RAF. Available from Public Record Office, Kew
4. AIR 20/9320, Document DDI (Tech)/S290/3A. Available from Public Record Office, Kew
5. AIR 20/9321, Document DDI (Tech)/C290/3. Available from Public Record Office, Kew
6. *Tales From Another Room* by Sir Peter Horsley (Pub. Pen & Sword, 1998)

7. Civil Aviation Authority Mandatory Occurrence Report No 8201614C
8. *Open Skies, Closed Minds* by Nick Pope (Pub. Simon and Schuster, 1996)
9. Joint AIRPROX (P) Committee Report No 2/95 (Civil Aviation Authority)
10. *Left at East Gate* by Larry Warren and Peter Robbins (Pub. Michael O'Mara Books Ltd, 1997)
11. *Parliamentary Debates (Hansard)*, Written Answers, Cols 628-629, 18 Dec 1996, Cols 1091-1094, 17 October 1996, Cols 423-424, 24 July 1996, Col 131, 13 Jan 1990, Cols 132-133, 13 March 1984, Col 62, 24 Oct 1983.
12. AIR 2/17527, MOD response to Lt Col J F Spaulding, 24 June 1965. Available from Public Record Office, Kew
13. R F Haines and J F Vallee, *J Sci Exploration*, **3**, (2), 1989, pp113-131
14. J King and J Miles-Booy, *UFO Reality*, **8**, June/July 1997, pp38-41
15. Michel C L Bounias, *J Sci Exploration*, **4**, (1), 1990, pp1-18
16. *Abductions* by John E Mack (Pub. New York, Simon & Schuster, 1994)