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UFOs and Exogenous Intelligence Encounters

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The search for extraterrestrial life has fascinated scientists and the public alike for over half a century. In recent years, astronomers and planetary scientists have multiplied their efforts to discover life forms by probing planets suitable for supporting its development with telescopes and robotic exploration missions. Although the probability of discovering micro-organisms on other planets is increasing, the prospect of making contact with developed, intelligent extraterrestrial beings remains distant. However, such an event can not be excluded; it may happen unexpectedly and under as yet unforeseen circumstances, but it remains in the realm of possibility. In fact, recent opinion polls have shown that a large part of the public considers such an event as very probable, or that it has even taken place already. Although the popularised perception of such "close encounters of the third kind" in the form of UFO sightings is scientifically unfounded, it helps to build public support for space exploration missions, advance scientific knowledge on atmospheric phenomena and psychologically prepare the public for encountering extraterrestrial life. Furthermore, one should not necessarily assume that such a contact would be initiated by humans, or that we would be able to realise and comprehend it based on our own experience and intellect. After all, it would be the greatest discovery in the history of mankind.

"…The idea of benign or hostile super beings from other planets visiting the earth clearly belongs in such a list of emotion-rich ideas. There are two sorts of possible self-deceptions here: Either accepting the idea of extraterrestrial visitation in the face of very meagre evidence because we want it to be true; or rejecting such an idea out of hand, in the absence of sufficient evidence, because we don't want it to be true. Each of these extremes is a serious impediment to the study of UFO; they affect different categories of people."[1]

Dr. Carl Sagan, 1969

1. Introduction

Gazing up at the night sky has been a source of wonder, a subtle mix of fear and an unstoppable need to question our origin and destiny since the beginning of time. We question what might lie in the star-lit sky beyond the range of humankind's limited view, and if we are indeed alone in the universe. Few other scientific discoveries could be more profound than discovering another life form in the universe, and the quest will keep haunting us as long as we have not found it, travelling along each of our future space endeavours. No one can be certain when this extraordinary event will take place, but we are now living a unique moment in human history. Half a century after Copernicus displaced the Earth from the centre of the universe, Galileo pointed a telescope toward the sky and its mysteries. Together, they changed the way we observe, conceptualise, and dream about ourselves and outer space. Today we are progressing toward another major change of paradigm of comparable magnitude. We could be the first generation to discover extraterrestrial life, and potentially answer one of the most important philosophical questions of humankind: Is anybody out there? Oddly enough, a large part of the worldwide population already thinks that the question has been answered, believing not only that other intelligent beings exist in the universe, but that they have already traversed space to our solar system.

[1] Carl, Sagan and Page, Thorton. UFO's: A Scientific Debate. New York: Cornell University, 1972: 265.

2. Cosmic Neighbours

Since the discovery in 1995 of the first exoplanet around a sun starlike, 51 Pegasi b, astronomers have detected more than four-hundred others circling distant stars. With at least two-hundred billion stars in our galaxy and expectations that twenty to seventy-five per cent of the stars include planets like Mercury, Venus, Earth, or Mars, astronomers today are confident that our galaxy alone hosts a dizzying number of Earth-like planets. Launched in March 2009, NASA's planet-hunting Kepler spacecraft will provide us with the first direct empirical evidence of Earth-like planets. It will spend three years staring at more than 100,000 stars for telltale signs of planets as small as Earth, orbiting sun-like stars in the "habitable zone" at distances where temperatures are right for liquid water. By 2013, we shall have a reliable estimate of the number of Earth-like planets in our galaxy. The existence of these "terrae incognita" in great quantity, if confirmed, will significantly increase the probability of life existing out there, perhaps even intelligent life. Based on the data from the Kepler spacecraft, the next logical step will be to design new ground and space-based instruments to obtain spectra of these exoplanets' atmospheres, in order to find evidence of signatures of life such as oxygen, which could be produced by biological processes. The ultimate step would be to send interstellar spacecrafts toward these potentially habitable worlds. Regrettably, it could take centuries before humanity gets to see what alien life looks like.

3. Micro Signs of Life

On Earth, another space race has started. It is a race between the planetary scientists and the astronomers to be the first to find extraterrestrial life, either in our solar system or further away. During the past decade, an enormous increase in interest among planetary scientists in the search for life or evidence of past life has energised the unmanned exploration of our solar system. The most promising targets include Mars, which has methane in its atmosphere, Jupiter and Saturn's moons Europa and Enceladus (in the light of evidence that oceans lie beneath their surfaces), Titan (because of its thick atmosphere and rich organic chemistry), and finally comets that are thought to be rich in organic materials.

What kind of life do scientists expect to find on our doorstep? Unfortunately to some, only primitive microbes or their remains are expected. Although this will constitute sensational news for the scientific community, the public excitement is likely to remain constrained[2]. After all, primitive bugs won't have too much to say. What everybody wants to know is not only whether or not there is life outside Earth, but whether the universe has produced other minds equal to or greater than our own: in others words intelligent life and other civilizations. Sadly, the first fifty years of space exploration has reduced our initial dreams of an "encounter of a third kind" to nothing. The present undertaking focuses on alien micro-organisms, carbon-rich molecules or gaseous signatures of life (probably inactive for millions of years and hidden in inhospitable locations). Our inner speculations, hopes and fears of discovering advanced extraterrestrial life with whom to communicate have simply been substituted by a seemingly less ambitious search.

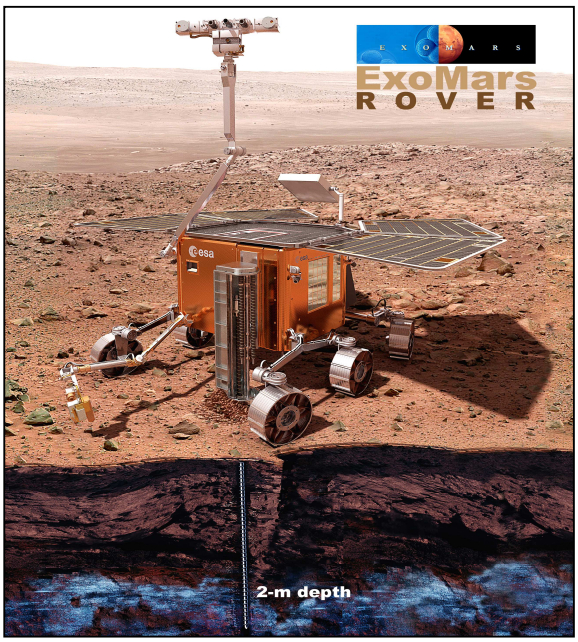

Fig. 1: Artistic view of the future European Rover and drill on the surface of Mars (source: ESA).

4. Extraterrestrial Detection

It is widely assumed that astronomers and space scientists will be the first to discover extraterrestrial life. Today's scientific quest for space life follows a roadmap characterised by four assumptions. First, discovery is a process under our control. Second, the search will be gradually implemented, keeping pace with our

[2] For an account on the ethics in encountering microscopic extraterrestrial life consider Cockell, Charles. "Ethics and Microscopic Extraterrestrial Life." Humans in Outer Space: Interdisciplinary Perspectives. Eds. Ulrike Landfester, Nina-Louisa Remuss, Kai-Uwe Schrogl, Jean-Claude Worms. Vienna: SpringerWienNewYork, 2011: 80.

technological developments. Third, the focus will be on searching for extraterrestrial life's precursors and simple life forms. Finally, the location of intelligent alien life forms will be at immense distances from Earth. However, a completely different situation could also unfold. At a NASA-Ames research centre workshop on the societal implications of astrobiology, Albert A. Harrison presented a matrix (Fig. 2) of four detection scenarios arranged along two dimensions. The vertical dimension reflects the level of life form encountered: either simple (cells, plants) or complex (civilisations). The horizontal axis expresses its degree of proximity to Earth; either proximal (in our solar system) or distal (outside the solar system). When the two axes of complexity and proximity are crossed, four scenarios of detection occur: "Distant Dust", "Microbes", "ET Calling" and "Space Visitors".[3]

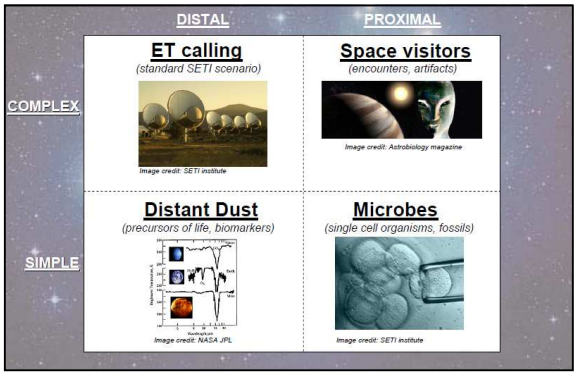

Fig. 2: Illustration of detections scenarios based on the work of American psychologist Albert A. Harrison.

The first two scenarios are associated with the field of astrobiology and our current exploration roadmap. The other two refer to advanced extraterrestrial civilizations. "ET calling" deals with the Search for Extra-Terrestrial Intelligence (SETI). SETI represents an exploratory science programme that searches for electromagnetic or optical transmissions from civilizations on distant planets[4]. The "Space Visitors" scenario seeks evidence of extraterrestrial intelligence within our solar system, including the discovery of alien artefacts, detection or sighting of extraterrestrial probes and the stereotypical science fiction encounter with aliens. This last scenario has fascinated the general public, but it is subject to wild claims, speculation and controversy. Nevertheless, there is no denying that direct on- or near-Earth contact with an extraterrestrial intelligence would have enormous psychological and social implications. And we might be the "discovered" rather than the "discoverers". As political scientist and sociologist M. Schetsche has explained, one possible reason why we tend to locate the sentient extraterrestrials at immense distances from Earth and concentrate on contacts through radio waves could be that such an eventuality would have fewer consequences for mankind than a close contact. In his words, "…the further away we know the aliens to be, the less threatening their existence appears to be[5]."

The discovery of alien life forms is not necessarily a process under our control and could take a totally unexpected form and turn.

The potentially dangerous consequence of such an unprecedented event has already been emphasized in a report commissioned by NASA and written by the Brookings Institution. Published in 1960, the "Proposed Studies on the Implications of Peaceful Space Activities for Human Affairs"[6] states that "anthropological files contain many examples of societies, sure of their place in the universe, which have disintegrated when they had to associate with previously unfamiliar societies espousing different ideas and different life ways; others that survived such an experience usually did so by paying the price of changes in values and attitudes and behaviour". Recommending further research areas in order to meet and adjust to the implication of such a discovery, the report suggested some factors that leaders would want to consider if faced with a decision about whether to release such information to the public: "How might such information, under what circumstances, be presented to or withheld from the public for what ends? What might be the role of the discovering scientists and other decision makers regarding release of the fact of discovery? ". Nowadays such considerations appear from a totally different perspective, in light of the phenomenal development of communication technologies and the advent of

[3] Albert A. Harrison. "Planning for contact: Fantasy documents or guideline for action". IAC-08-A4.2.6

[4] "SETI's Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence." Humans in Outer Space: Interdisciplinary…: 291.

[5] Schetsche, Michael T. "SETI (Search for Extraterrestrial Intelligence) and the Consequences: Futurological Reflections on the Confrontation of Mankind with an Extraterrestrial Civilization." 1 July 2005. Astrosociology.com. 21 Jun. 2010. http://www.astrosociology.com/Library/PDF/Contributions/SETIandConsequences_ENG.pdf
Schetsche, Michael T. "Encounters among the Stars – Exosociological Considerations." Humans in Outer Space: Interdisciplinary…: 102.

[6] NASA Technical report. December 1960. Proposed studies on the implications of peaceful space activities for human affairs. 242. http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/1964053196.pdf

the internet revolution. In the case of SETI and if a signal from an extraterrestrial civilization is detected, we can be assured that the news of the discovery will reach the public almost immediately. A conspiracy to withhold or conceal the evidence of an extraterrestrial signal would be all but impossible. However, and in the eventuality of the last detection scenario depicted by A.A. Harrison, one could think that the decision to announce such news to the population would represent a totally different situation, and might not be easily taken.

Fear associated with any direct extraterrestrial contact has recently resurfaced in the media. Notably, the famous British theoretical physicist Stephen Hawking suggested that aliens were almost certain to exist, but instead of seeking them out, humanity should be doing all that it can to avoid contact[7]. His view is consistent with the general military principle of never giving away one's own defensive position until a potential adversary's capabilities have been adequately assessed and are sure to be readily met. Despite the underlying fear and the fact that astronomers do not expect aliens to be visiting Earth given the timescales and the fantastic amount of energy required for interstellar travel, much of the public thinking about extraterrestrial intelligence assumes aliens have travelled to our solar system.

5. The Lure of Local Encounters

Public surveys regularly indicate not only a widespread belief in the existence of intelligent extraterrestrial life, but also and more intriguingly an acceptance that it is already visiting us in the form of what is popularly called Unidentified Flying Objects (UFOs). A national media poll commissioned in August 2002 by the SCI FI channel and conducted by RoperASW via OmniTel sampled 1,021 American adults and revealed two particularly interesting details[8]. First, more than half (56 %) of the sample thought that UFOs were real and not just the product of people's imagination. Second, one in seven Americans said they or someone they knew had had an experience involving a UFO. More recently, in April 2010, a Reuters Ipsos poll[9] of 23,000 adults in twenty-two countries reported that one in five respondents said they either "strongly" or "somewhat" agreed with the notion that extraterrestrials are already living within their communities, disguised as humans.

Statistically, the public opinion's interest and belief in UFO phenomena is high.

This public fascination for Ufology (the study of unidentified flying object (UFO) reports, sightings, alleged physical evidence, and other related phenomena) was revealed further when two governments announced the publication of their official files. France was the first, when in March 2007 its space agency "Centre National d'Etudes Spatiales" (CNES) created a website documenting 100,000 pages of testimonies, photographs and statistics on UFOs. Within two hours of allowing access to the site, the CNES web server crashed, overwhelmed by the flood of viewers around the world attempting to access the information[10].

One year later, starting from May 2008, the United Kingdom's Ministry of Defence (MoD) initiated the declassification and release of thousands of documents related to UFO sightings through the country's National Archives web site[11]. Although this decision was guaranteed to generate intense international interest, no one had foreseen the actual record internet traffic. In the first four days there were 1.3 million downloads of information from the site. However, these public reactions and poll results are nothing new. It is merely the result of a controversy and phenomenon which started more than 60 years ago, a decade before the launch of Sputnik and as stated by NASA Chief Historian Steven J. Dick:[12] "In which lies an important chapter in the history of the extraterrestrial life debate, between public gullibility and scientific close-mindedness, between perception and reality and a story of the limits of science under the most trying circumstances".

6. The UFO Phenomenon

The last century has seen the emergence of a phenomenon that has generated intense interest and invaded the modern consciousness on a worldwide scale. Although embedded in

[7] Leake, Jonathan. "Don't talk to aliens, warns Stephen Hawking." The Sunday Times 25 Apr. 2010.

[8] "The 2002 Roper poll." Sep. 2005. Coalition for freedom of information. http://www.freedomofinfo.org/national.html

[9] "One In Five (20%) Global Citizens Believe That Alien Beings Have Come Down To Earth And Walk Amongst Us In Our Communities Disguised As Humans." The Reuters Ipsos Poll 8 Apr. 2010. Ipsos http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=4742

[10] "Le groupe d'études et d'informations sur les phénomènes aérospatiaux non identifiés (CNES/GEIPAN) ". http://www.cnes-geipan.fr

[11] "Newly Released UFO Files from the UK Government". The National Archives. August 2010. http://www.nationalarchives.gov.uk/ufos/

[12] Dick, Steven J. The Biological Universe. Cambridge: Cambridge University Press, 1996.

everyone's psychology and having gained the status of a modern myth, it is still necessary to give a definition of the term: "a UFO is the reported sighting of an object or light seen in the sky or on land, whose appearance, trajectory, actions, motions, lights, and colours do not have a logical, conventional, or natural explanation, and which cannot be explained, not only by the original witness, but by scientists or technical experts who try to make common sense identification after examining the evidence"[13].

The modern belief that extraterrestrials visit Earth has been growing since the late 1940s. More precisely, the modern UFO era started on June 24, 1947 when American businessman Kenneth Arnold[14], while flying his private plane near Mount Rainier, Washington, reported seeing nine brilliantly lit disc-shaped objects travelling at tremendous speed. It was his description of the objects as flying "like a saucer would if you skipped it across the water" which gave rise to the term "Flying Saucer". Arnold's sighting was followed in the next weeks, months and years by hundreds of other reports, mostly in the U.S. but also in other countries. This led to an extensive twenty-two year long official U.S. Air Force UFO investigation, the Project Blue Book, which ended in 1969 following the publication of the Condon committee's final report. This document, formally titled "Scientific Study of Unidentified Flying Objects", stated the following in his introductory chapter "Conclusions & Recommendations": "our general conclusion is that nothing has come from the study of UFOs in the past 21 years that has added to scientific knowledge. Careful consideration of the record as it is available to us leads us to conclude that further extensive study of UFOs probably cannot be justified in the expectation that science will be advanced thereby"[15].

Despite this negative conclusion, the topic refused to disappear. Over more than sixty years, many thousands of people from all walks of life, including numerous credible civilian, governmental and military witnesses, have reported UFO sightings practically all over the world. This in itself was not totally unexpected, as the Condon committee's conclusion that science had nothing to gain by studying UFOs was in total contradiction with the committee's investigations. Indeed, one third of all the cases that it had studied had remained after all unexplained after analysis. The number of reported UFO experiences logged in three governmental databases reflects a steady and sometimes impressive number of yearly events (Fig.3). Even so, such statistics likely underestimate the extent of UFO observations as some witnesses decide not to make public their sightings due to the reticence and fear of ridicule.

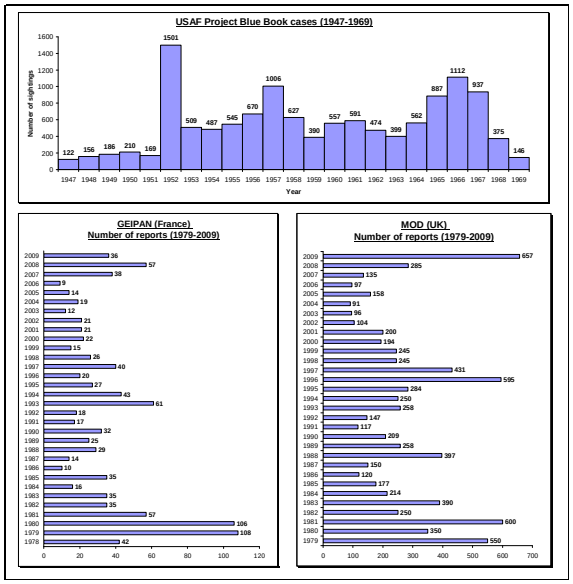

Fig. 3: Official number of UFO reports transmitted to the Authorities. (Sources: USA: Blue Book' statistics, France: CNES website, United Kingdom: Ministry of Defence website)

Project Blue Book found that only thirteen percent of the persons who stated that they had had a UFO experience had reported it in a public way[16]. Even if underestimated numerically, the vast majority of events reported as UFO sightings can be easily explained in conventional terms such as the misidentification of natural (e.g. meteors, planets, clouds) or man-made phenomena (e.g. rocket launches, satellite re-entries, Chinese lanterns). Nevertheless, the existence of a small number of cases that remains unexplained despite their analysis gives to the subject a strong aura of mystery and fascination.

The UFO literature does contain more than simple sightings of lights in the sky. It also includes testimonies made by police officers, airplane pilots, and armed forces personnel that prove intriguing and sometimes alarming (e.g. unexplained radar images of air traffic control,

[13] Hynek, Allen J. The UFO Experience: A Scientific Inquiry. Chicago: Henry Regnery Co., 1972.

[14] It is to be noted that the UFO phenomenon is not a recent historical occurrence and has not started appearing after World War II. Many ancient documents reveal reports of mysterious aerial phenomena. A useful reference is: Vallee, Aubeck. "Wonders in the sky". Tarcher/Penguin, 2010.

[15] Condon, Edward U. Scientific study of Unidentified Flying Objects. Colorado: The University of Colorado and United States Air Force, 1968.

[16] Ibid: 315-364.

near-missed collisions with passenger airplanes, electronic equipment malfunctions, physical traces on the ground, physiological effects on witnesses, or U.S.A.F. fighter jets scrambling to shoot down UFOs). Even more controversially, official files include UFO sightings at very close distances (e.g. close to or on the ground), alleged observations of animate beings close to the UFOs (popularly called "encounters of the third kind"[17]), and even claims of alien abduction. The extraterrestrial hypothesis, i.e. the idea that some UFOs may be spacecraft sent to Earth from another civilization or space other than earth, or on a planet associated with a more distant star, was bolstered by such claims and represents the most widely debated hypotheses. Though these outstanding UFO reports are immediately prone to ridicule and dismissal, some have been found neither to have a common explanation nor to be hoaxes. These unexplainable cases form the hard core of the UFO controversy. Although some controversial reports cannot be conclusively refuted, there is no scientifically acceptable evidence supporting the idea that some UFOs may be spacecraft from another civilisation. Absence of evidence however should not be taken as evidence of absence. There is a need to keep an attitude of humility and scientific open-mindedness, especially since some UFO reports might represent events worthy of research. Rare atmospheric events, near-earth space phenomena, unexpected consequences of human activity (space debris, electromagnetic signals and pollution), social, cultural, and psychological phenomena, or interactions among all of the above could be revealed by further study of UFO cases.

7. Psychological and Cultural Influences: Learning About Ourselves

The purpose of this section is not to analyse whether the extraterrestrial hypothesis in support of the UFO phenomenon can be considered as a legitimate hypothesis. Rather than entering the speculative arena, we can turn our attention to the influences that the UFO controversy has exerted in broad terms on our space exploration activity and on the search for extraterrestrial life.

In a recent American cable news channel MSNBC poll for selecting the top space story of the year 2010, Unidentified Flying Objects received the most votes. The topic accounted for an outstanding 52% of the choices, far ahead of the others proposed scientific space headlines (Sunrise for private rockets 17%, Earth-sized worlds on the horizon 15%, Arsenic alien life or false dawn 8%, NASA' s shifting course 7%).

Although the great majority of UFO phenomena can be explained, we need to remain open-minded in their study.

Aside from reflecting once again the enormous interest that the UFO phenomenon continues to elicit among the public, such poll results can also tell us something else. They highlight the perceived likelihood that in the course of our future interplanetary explorations we may encounter intelligent beings of other species. Although considered highly improbable today, humans should at least be open to this eventuality. Back from a 16-day Endeavour mission, space shuttle's astronaut Gregory Johnson said at a news conference in 2008: "I personally believe that we are going to find something that we can't explain…there is probably something out there but I have never seen it…" This is not in itself an irrational thought. Given the vast number of stars in the Milky Way and the fact that the majority of them are much older than our Sun, there has been plenty of time for life to develop on other planets and for intelligent, technological civilisations to develop advanced interstellar transportation systems, if such development is physically possible. After all, ours is only a one hundred year-old space technology in a twelve billion year old galaxy, and we have already sent some of our own spacecraft (Voyager and Pioneer) into the cosmos. As a matter of fact, scientists have already reflected this eventuality into the design of our unmanned interplanetary probes, by equipping them with the ability to communicate with extraterrestrials. For the benefit of other space-faring civilizations, the Pioneers 10-11 and Voyagers 1-2 spacecrafts (Fig. 4) are travelling through the cosmos with golden plaques and phonograph records, featuring pictorial messages and information on the nature of our species, our location and some humankind greetings. One of our recent robotic rovers, the Phoenix Mars Lander, was also equipped with a Digital Video Disk that contains a multimedia collection of literature and art about the Red Planet and also messages addressed to

[17] Term coined by A. Hynek (United States astronomer, professor, and scientific adviser of the Project Blue Book) in his book: The UFO Experience: A Scientific Inquiry. Hynek introduced a system of classification for grouping UFO events. Sightings more than five-hundred feet (160 m) from the witness are classified as "Daylight Discs," "Nocturnal Lights," or "Radar/Visual Reports". Sightings within about five-hundred feet are sub-classified as various types of "close encounters". Directed by Steven Spielberg, the 1977 movie "Close Encounters of the Third Kind" took its name from this categorisation.

future Martian visitors, including songs, pictures and poems.

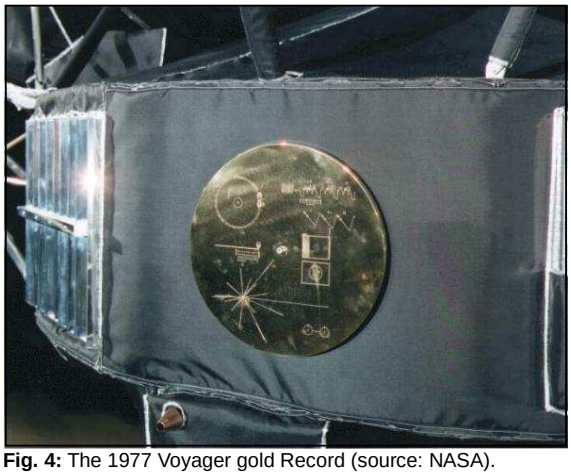

Fig. 4: The 1977 Voyager gold Record (source: NASA).

Sixty years of Ufology debate and wild claims have gradually accustomed us to this eventuality. Scientists and astronauts are themselves not immune to an interest in UFOs. Former NASA Astronaut Edgar Mitchell, a member of the Apollo 14 mission that landed on the Moon, asserted in 2008 that "I happen to be privileged enough to be in on the fact that we have been visited on this planet and the UFO phenomenon is real…" Public fascination with the idea of extraterrestrials and the claims of close encounters creates social and psychological momentum from which space agencies may benefit and build upon. This interest facilitates the funding of projects focusing on exobiology and the search of exoplanets. No other theme is likely to engage the public as much as that of intelligent extraterrestrial life and this is particularly obvious when looking at the current portfolio of planned missions (Mars rovers, orbiters for Europa and Ganymede, exoplanets' telescopes). The UFO controversy has helped and still helps to raise the general public interest in this kind of space activities, and therefore enables their financing.

This social and psychological momentum isn't likely to remain limited to the long established governmental space agencies. The new commercial space enterprises which began appearing over the last few years are likely to reflect upon the ways in which they can exploit this situation. Indeed, the emergent area of space tourism promises to offer not only professional astronauts but also private individuals a radically new human perspective in the near future: the opportunity to contemplate Earth from orbit, to experience the sensation of weightlessness and a deeper viewing of the cosmos. Undoubtedly these new space travellers will also ponder over the question of the existence of extraterrestrial life. Having been exposed to the UFO/Alien controversy for decades and being aware of the topic's high appeal, the new space entrepreneurs will surely be interested in building upon public fascination to propose some innovative concepts.

Commercial space enterprises might be inclined to exploit the UFO controversy in the future.

In fact such a situation already exists. Bigelow Aerospace, the Nevada-based company that has launched two subscale pathfinders of an orbital inflatable space station (Genesis I and II) into low Earth orbit represents the first private spaceflight company to link the space business with the UFO topic. Its founder, the real estate millionaire Robert Bigelow, has been a researcher and student of UFOs for decades. Before he started designing the inflatable space station (for which a launch date of 2015 has been stated), he founded and financed the "National Institute for Discovery Science", which aimed at researching and advancing serious study of various fringe science and paranormal topics, most notably Ufology. His organisation was even listed in the Federation Aviation Administration (FAA) manuals as the first point of contact in the United States to which the FAA shall report UFOs. Whether motivated by the possibility that his engineers might reap the benefits of any UFO breakthrough, allowing them to generate re-engineering spin-offs, or that his orbital space station might provide a first step in making contact with an extraterrestrial intelligence, Mr. Bigelow keeps a close interest in the topic in parallel with his commercial space activities. As recently as June 2010, he emphasized his views: "…Anybody that does research, if people bother to do quality research, comes away absolutely convinced. You don't have to have personal encounters…People have been killed. People have been hurt. It's more than observational kind of data"[18]. In 2008, space business got even closer to UFO research. Bigelow Aerospace published a small video clip taken from one of Genesis I external cameras on its website, which depicted an unidentified moving bright spot. The public was invited to analyse the film and submit on-line some "educated guesses" about its origin.

A second influence relates to communication policies within space agencies. Because the UFO discourse is partially constructed around

[18] International Herald Tribune "U.S. entrepreneur reaches for outer space". 09 June 2010.

suspicion that governments hide the truth from the public, conspiracy theories and sensational claims in this field abound. Undoubtedly, space agencies have to be prudent with their outreach and take into account the public zeal and the media's greed for sensational headlines. They also need to be judiciously responsive to public demands, perhaps even the controversial ones.
The examples of the "Face on Mars" and the "Discovery space shuttle's video footage" are illustrative of this point. A 1976 picture from the Mars Viking orbiter attracted attention, because one of the hills it pictured appeared to resemble a human face. Some individuals used the information to create widespread speculation about a possible artefact of extraterrestrial origin. Pushed by the public belief that the red planet might have once been home to intelligent beings, NASA and ESA decided to collect new data. More than 20 years after the first images were taken; some other spacecrafts arrived over Mars and targeted the area. The new pictures showed that the alleged artefact was simply the Martian equivalent of a butte or mesa. There was no alien monument after all.

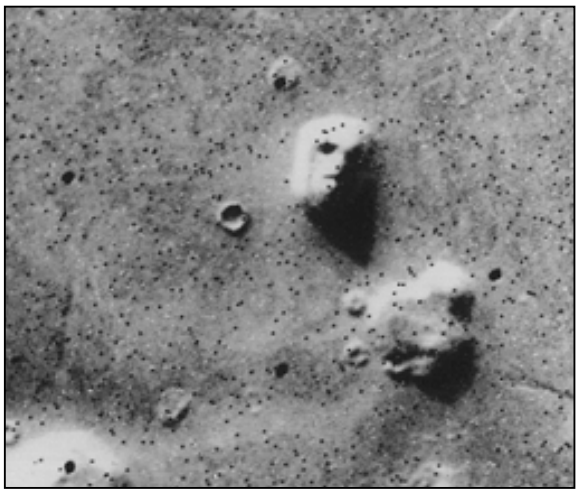

Fig. 5: The 1976 Viking 1 photograph of the Face on Mars (source: NASA).

Another controversy surfaced in 1991 regarding a video footage taken by the cameras of the STS-48 space shuttle. The film showed what appeared to be several small bright objects manoeuvring and interacting with one another. Since the material had been shown in news broadcasts, NASA had to enter the public debate and provide convincing proof that the dots were only small sunlit debris hit by the expanding exhaust of the shuttle steering rocket, and not alien probes. These stories reveal that photos and footages taken by spacecraft are studied by the public for evidence of alien probes or the presence of extraterrestrial intelligences. The current wealth of new information arriving from surface and orbital space missions, associated with an ever-increasing release of spacecraft images, will certainly continue generating new advocates for UFOs and aliens in space.`

The UFO phenomenon, like space exploration itself, may play a role in preserving our hopes and expanding our dreams. It may help address a philosophic, existential, or even religious need for us to find a deeper meaning and importance in our lives. Confined as we are today to our solar system and residing in an inhospitable universe "of unfathomable dimensions, criss-crossed by all kinds of lethal radiation and particles, populated with diabolical objects such as quasars, black holes, pulsars[19]", (to which we might now add dark matter and dark energy), the future possibility of detecting or encountering extraterrestrial intelligence offers us reassurance that we are not alone. We want to know that we are not the only intelligent being in the vastness of space, and we are, at times, desperate to find an answer to our existential questions. We feel a need to be reassured, to believe that there is somebody out there, somebody who could protect or help us, and perhaps more importantly demonstrate by their own existence that technological civilisations can be sustainable over long periods of time. Space exploration and Ufology both answer to this innate need.

Studying UFO phenomena could increase public support for space exploration and improve the space agencies' outreach.

A decade before the launch of the world's first artificial satellite, the UFO controversy had already impregnated human consciousness with the idea that not only was life "out there," but that it was "intelligent" Sixty years later and despite the precedent of acceptance of the search for alien intelligence, it is today more politically acceptable to search for non-intelligent alien life. There is often a "giggle factor" surrounding the idea of extra-terrestrial intelligent life, coloured by pejorative references to "little green men". Despite this, one should recognise that the primary influence exerted by the subject of UFOs on our search for extraterrestrial life may have been to open our minds to the eventuality of direct contact with a non-human intelligence, regardless of its proximity. Since the UFO debate regularly surfaces in the media, it would seem that the UFO phenomenon has accustomed the general

[19] Davoust, Emmanuel. The Cosmic Water Hole. Massachusetts: MIT Press, 1991.

public to the idea of discovering extraterrestrial life. It has prepared us psychologically for such extraordinary news. If the time ever comes, perhaps the discussion would have warmed its receipt and acceptance to the point where it may not be the world-changing shock expected by some researchers anymore.

Research on UFOs has familiarised public opinion with the likelihood of discovering extraterrestrial life, easing its sociological consequences.

We do not have the slightest idea what an extraterrestrial advanced civilization might turn out to be. If it could reach us, it would have to be advanced to a level of scientific knowledge and technology far surpassing our own. Perhaps what we will encounter is its post-biological (robotic) technology. Because we are limited in our ability to imagine technologies well beyond our own, we should be ready to investigate all potentially promising possibilities. Still, a delicate equilibrium needs to be maintained. Being open-minded risks opening the door to pseudo-science. Yet judicious scepticism can encourage the premature dismissal of reports of anomalous phenomena that could one day manifest a genuine extraterrestrial visit. UFO research has taught us some lessons that constitute a useful reference regarding the broader search for extraterrestrial life.

Furthermore, the UFO phenomenon has opened up a completely new dimension in the searching methods for extraterrestrial life. Confronted with the emergence of the UFO phenomenon and a sudden burst of unexplained sightings around a well-defined geographic area, some field experiment initiatives have been launched in order to supplement visual observations with scientific measurements. Both governments and NGOs in the U.S., Canada and Europe undertook various instrumented field studies during the period 1950-1990 to explore the physical reality of the UFO phenomena and to reveal the potential presence on Earth of probes of extraterrestrial origin[20]. Despite the lack of clear conclusive results, these initiatives have demonstrated the feasibility of applying the scientific method to gathering evidence on and studying anomalous aerospace phenomena, and confirmed their potentially important and proactive roles in resolving the UFO enigma. This is in contrast to the simple cataloguing of testimonies of events that have already occurred. Perhaps even more importantly, these attempts raised questions of a technological and methodological nature on our ability to observe and recognize UFOs. If indeed some of these phenomena represent advanced alien probes, it is far from obvious that our current technological means would allow us to detect their presence. In that respect, the repeated argument that: “if there would be a UFO evolving in the Earth vicinity, we would know it thanks to our radars, telescopes or satellite capabilities”, clearly constitutes an anthropocentric assumption. Advanced extra-terrestrial civilizations potentially million of years older than us could display technologies that would be indistinguishable from our environment, appear to us like magic and limit our knowledge of their presence.

Fig. 6: Shirley Bay Sudbury, Ontario. “Flying Saucer” Ionospheric observatory of the Canadian Transport Department (Source: Daily Star, 21/11/1953). Described in [20]

In general, UFOs teach us that we need to be open minded in our research, as our anthropocentric biases and observational capabilities could limit our ability to detect and identify extraterrestrial life and intelligence.

An additional influence of the UFO phenomenon is found in the alleged encounters of the third kind. Claims of direct observations of animate beings at close proximity to UFOs and abduction reports have created an image of what an alien should look like in the public mind. Popularised by the movie industry and commercial media, every one of us has been exposed to the “alien

[20] Ailleris, Philippe. The lure of local SETI: Fifty years of field experiments. Acta Astronautica 67, 2010.

icon": a little grey creature with a big head, elongated eyes, and long arms. This is now the kind of extraterrestrial that we expect to encounter.

It should not be taken for granted that intelligent forms of extraterrestrial life would be readily identified by humans.

Related to this context of alleged sentient extraterrestrials, a different sort of influence is equally worth emphasizing. It relates to the specific biological issue of convergent evolution. Assuming that the origin of life is not a complete fluke and that the evolutionary pathways leading from one-celled organism to intelligent beings are numerous, an interesting exobiological question is whether an humanoid form is a potentially common evolutionary product or not. In other words, can the alien physiologies be conformed or a close approximation of our own? The UFO phenomenon fuels also this debate through its alleged sightings of UFOs at close distance (some famous examples of "close encounters of the third kind" would be: Boianai, New Guinea, 1959; White mountains, USA, 1961; Valensole, France, 1965; Allagash, USA, 1976; Emilcin, Poland, 1978; Ruwa, Zimbabwe, 1994). Such controversial cases are considered a priori false and immediately prone to ridicule due to the fact that the observed anthropomorphic similarities of the "UFOnauts" are considered impossible and pure anthropocentric presuppositions. The described alien body structures are not alien enough. As argued by Jacques F. Vallee[21], if the alleged entities were the product of independent evolution on a different planetary environment, how could be explained the following observed similarities: "…A humanoid shape characterized by two legs, two arms and a head supporting the same organs of perception we have, in the same number and general appearance…Their speech using the same frequency range as ours and their eyes adapted to the same general segment of the electromagnetic spectrum. And also the fact that they can walk normally on Earth, breathe our air and exhibit some recognizable emotions…" Therefore scientists disqualify those UFO reports as pure fantasy, and regularly scorn the movie industry's simplistic notion of the extraterrestrial, whose anatomy is invariably inspired by the body plan of Homo sapiens.

However, it appears that the debate is still open. In a recent interview (for a Royal Society conference on the detection of extra-terrestrial life and the consequences for science and society), the leading evolutionary paleobiologist Simon Conway Morris offered a radically different perspective "…In the end the number of options is remarkably restrictive. I don't think that an alien will be a blob. If aliens are out there they should have evolved like us. They should have eyes and be walking on two legs. In short if there is any life out there then it is likely to be very similar to us". Clearly it is important to remain open-minded and explore beyond the boundaries of what is currently believed. British biologist J.B.S. Haldane is often quoted for saying: "My own suspicion is that the universe is not only queerer than we suppose, but queerer than we can suppose".

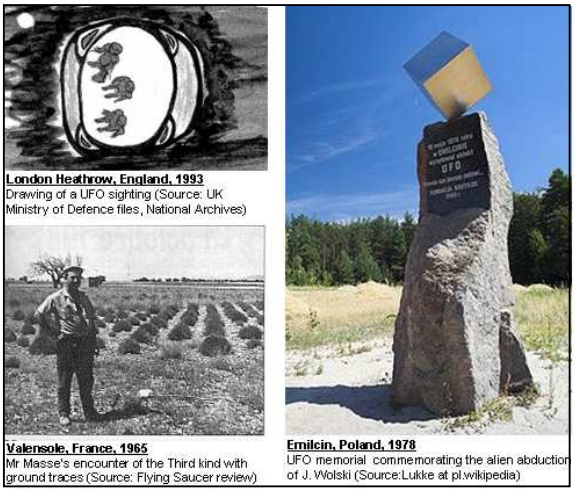

Fig. 7: Anomalous events: The alleged "Encounters of the Third kind".

Last but not least, the UFO discourse invites us to broaden our horizons, raises the question of otherness, forces us to consider the degree of uniqueness and intelligence we are willing to attribute to aliens, and also highlights our anthropocentric biases. The UFO research represents a natural experiment pertaining to what we could expect if we come into contact with an extraterrestrial intelligence. In every respect this will certainly be an ambiguous and controversial situation, raising some challenging questions. For example, since extraterrestrial intelligence could turn out to be completely different from what we have learned to expect from life on Earth, would we be even able to see and recognise it? Moreover, if these civilisations are million of years older than us, their technologies could be indistinguishable from our environment or they could appear like magic.

From a cognitive point of view, do we know how to study something that knows it is being studied, might not want to be studied, or might

[21] Jacques F. Vallee. Five arguments against the Extraterrestrial origin of unidentified Flying Objects. Journal of Scientific Exploration Vol. 4, 1990.

even be studying us in return? We have made the unconscious assumption that alien life will be similar to familiar biological life forms, with human-like shapes, interests, and motives. Yet such a similarity is far from certain as some post-biological alien beings could exist. This reflection around the notion of contact and communication with other sorts of intelligence certainly compels us to question our own identity. Perhaps, as Russian cosmonaut Fiodor Yurchikhin stated last July 2010 while being on board the International Space Station, we should simply acknowledge that at this stage humankind is not ready to meet aliens: "…For me, a 'contact' means is shall not be harmful... While the civilization was developing, many cities and nations vanished…We are only getting closer to the understanding of a united world. So, we are not ready to contact aliens. We still have to learn to contact with each other". In the end, aliens might not even be interested in us, as we may seem too primitive to them warrant their attention.

8. Conclusion

Fifty years after the beginning of human space exploration, one of the main fascinating scientific questions remains unanswered: whether or not extraterrestrial life exists in the universe. In striking contrast, the belief in the existence of exogenous intelligences and the presence of extraterrestrial beings in our environment has been a widespread cultural phenomenon since the end of the 1940s. The hypothesis that sightings of anomalous aerospace phenomena could perhaps represent visits of extraterrestrial spacecrafts has generated intense interest and invaded the modern consciousness on a worldwide scale, and will certainly continue to do so for the foreseeable future.

Regardless of the final explanation(s) regarding the nature of the UFO phenomenon, its influence on the pursuit of space exploration and on the greater search for extraterrestrial life is not negligible. Although at present there is no scientific proof of an extraterrestrial origin of the UFO phenomenon, for various reasons it remains important for us to keep track and continue studying all reports of anomalous events. First, the presence on Earth of devices of exogenous origin could resemble anomalies in our atmosphere. Second, the continuous analysis of anomalous events may provide us with new insights into the nature of physics. Finally, any analysis of unexplained atmospheric events or unusual aerial perception could lead to a deeper understanding of our planet and safer air travel[22]. In addition and above all, the UFO controversy provides us with invaluable information on our society and its way of thinking, encouraging us to keep an attitude of humility and scientific open-mindedness, ever-cautious of our anthropocentric presumptions. Undoubtedly, direct, convincing and unequivocal evidence of the existence of extraterrestrial intelligence would be the most extraordinary discovery in the history of mankind. However, there is much to be learned on the way towards this objective.

[22] The Argentine Air Force announced on 29/12/2010 that it will set up a multidisciplinary commission to investigate UFO sightings. The decision was made in response to reported sightings by pilots and radar of unidentified flights, which are a potential threat to national air security. Source: AFP.

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