

On the other hand one has only to look at the vast radar coverage of this continent — air traffic control radars, weather radars, military surveillance radars, and ballistic missile detection systems — and one realizes that it would be impossible not to pick up and track any extraterrestrial spacecraft. For example, experiments have shown that a high-power air-defense radar can detect a single bird at ranges up to 160 km, and even a single bumblebee released from an aircraft. It has been stated that some of the best missile detection radars can detect an object the size of a 0.22 calibre bullet at more than 1600 km. Yet no extraterrestrial spacecraft has ever been tracked.

(iv) Local effects of UFO landings

Three of the most commonly reported observations attributed to UFO's are 'landing pad' depressions in the soil, broken tree limbs, and burnt rings in the grass. In addition to the obvious invitation to hoaxers, these effects can often be explained by natural circumstances. A 'believer' who wants to find UFO evidence will search for a pattern of three or four depressions in the ground, or for limbs of trees broken in the area, or for burnt patches produced by an exhaust, and will probably find something which approximates one or more of these conditions. However, careful measurements usually show that the so-called pad depressions are not precisely spaced or oriented and are probably a random coincidence of natural roughness. Broken branches can be found on almost any tree if one looks for them. Finally, burnt rings in the grass are well-known to agricultural scientists and golf course operators throughout the country. Circular rings of burnt grass are produced at certain times in the year by the action of the fairy-ring mushroom.

(v) Close encounters

These cases involve stories of close encounters with either spacecraft or their occupants. No such cases have ever been adequately substantiated. After thorough investigation they have either been admitted or suspected hoaxes, or else the story had so many inconsistencies that a hallucination or misrepresentation of the truth is suspected.

HOAXES AND FABRICATED STORIES

Hoaxes and fabricated stories occur in any of the areas of visual, photographic, radar, local effects and close encounters reports. School boys have caused many spectacular sightings by flying hot air plastic bags with candles under them. Sometimes stories are fabricated to achieve notoriety, and sometimes economic gain is the motive. For example, payments for TV appearances or publication rights, attraction of tourist dollars to a community, and increasing the market value of a property.

SCIENTISTS' VIEWS ON EXTRA-TERRESTRIAL LIFE

When one considers the abundance of complex molecules revealed in outer space by the spectral studies with radio telescopes, and the fact that there are 2×10^{11} (200 billion) stars in our own Milky Way galaxy, few scientists doubt that there are probably many planets in our galaxy with intelligent life forms. However, to be consistent one must also analyze the probability of an advanced civilization travelling many light-years of distance to our particular infinitesimal spot. In addition to the immense difficulties of distance and location, such a civilization must co-exist in

time with our limited existence within the 10 billion year history of the galaxy.

To put the probability in even closer perspective, consider the possibility of radio communication with even the closest star (Alpha-Centauri), 4 light-years away, and assume that it has a co-existing advanced civilization which can respond to us. Even though our signals travel with the speed of light, it would take 4 years to send each message and another 4 years to wait for the reply to return. At a more probable distance of about 1000 light-years to the nearest civilization, many generations of men would die before any acknowledgement would be received to a query. Any form of physical travel would take much longer because the speed of light could not be reached by a material object. If one thinks that perhaps some alien craft might home in on earth's radio emissions, one must remember that radio wave generation on earth is only about 60 years old, and high power radio generation only about 20 or 30 years old. Hence, the outwardly advancing front of these signals is still only 60 light years from earth. Civilizations beyond this distance would not even yet be aware of our existence.

UFO FILES AT THE NATIONAL RESEARCH COUNCIL

All UFO reports received by the Canadian government since 1965 are on file at the National Research Council. These files are unclassified, and are open to inspection by the public upon appointment. The files arose as an offshoot of the cross-Canada network for collecting meteor fireball reports which assist the meteor research being done in the Planetary Sciences Section of the Herzberg Institute of Astrophysics. Reports of both phenomena are received via the communication networks of the Armed Forces, the R.C.M.P., Associate Committee on Meteoritics, and by mail from the general public. These are separated at N.R.C. into the meteoritic and non-meteoritic (UFO) files. Additional field investigations are not done in general since the available details are normally communicated from the source. Further investigations, if any, are done only if the scientific content appears to justify it.

SUMMARY

Two thousand years of observations and thirty years of rather intensive collection (15,000 reports in the USAF Project Bluebook and 1500 in Canada) and examination of reports have not yielded any positive sighting or artifact of extra-terrestrial origin. However, the data collection process continues for its scientific merits to aid in meteor research and the recording of rare atmospheric phenomena. If and when some new phenomenon is observed, the data will be available for interpretation. An improved awareness by observers of the errors and biases inherent in the human senses will help to produce more useful data. More precise notation of time, location, azimuth and elevation of the object, weather conditions, and the presence or absence of sun, moon, and stars would also be helpful in reporting observations.

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