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WASHINGTON: 1976

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Historical Research Center
Maxwell AFB, AL 36112

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Technical Report No. F-TR-227-IR

RETURN TO
AFSHRC
MAXWELL AFB AL 36112

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49/02/00

UNIDENTIFIED AERIAL OBJECTS

PROJECT "SIGN"

SMC

AMC

INTELLIGENCE DEPARTMENT

Release Date:
February 1949

HEADQUARTERS AIR MATERIEL COMMAND

WRIGHT-PATTERSON AIR FORCE BASE

DAYTON, OHIO

S-11750-18

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Technical Report UNCLASSIFIED No. F-TR-2274-IA

UNIDENTIFIED AERIAL OBJECTS
PROJECT "SIGN"

L. H. Truettner
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(Project No. XS-304)

Approved by:

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ABSTRACT UNCLASSIFIED

A descriptive and analytical study of the unidentified aerial objects, that have been reported both in the United States and from foreign countries, is presented.

Individual cases are described in brief form, as an appendix.

The analytical treatment of the subject is largely of a qualitative and generalized nature. However, detailed analyses and detailed results are presented, where this procedure is possible and will assist in establishing the validity or tenability of an overall hypothesis.

Project "Sign" is still largely characterized by the collection of data, without sufficient information to permit definite, specific conclusions to be made. No definite evidence is yet available to confirm or disprove the actual existence of unidentified flying objects as new and unknown types of aircraft. A limited number of the incidents have been identified as known objects.

[redacted]

FOREWORD

Project "Sign" was initiated by the Technical Intelligence Division, Air Materiel Command, and assigned Project Number XS-304, 22 January 1948, under authority of a letter from the Deputy Chief of Staff, Materiel, USAF. This letter is referenced C/S, USAF, 30 December 1947, subject "Flying Disks."

Assistance in analyzing the reported observations has been provided by other Divisions of Air Materiel Command in accordance with Technical Instructions TI-2185, Addendum No. 3, dtd 11 February 1948, subject: "Project Sign" - Evaluation of Unidentified Flying Objects".

Analysis of the reported incidents, as an effort to identify astro-physical phenomena, is being accomplished by Ohio State University under contract with Air Materiel Command.

A special study has been initiated with the Rand Project in accordance with Air Corps Letter No. 80-10 dtd 21 July 1948 to present information that would serve to evaluate the remote possibility that some of the observed objects may be space ships or satellite vehicles.

Members of the Scientific Advisory Board to the Chief of Staff, USAF, have also supplied their services in a consulting capacity.

INTRODUCTION

This report is written to present the status of work being accomplished on Project "Sign", to summarize the data collected on sightings of unidentified aerial objects, to review the methods and reasoning applied in the evaluation of the data, and to present the results so far obtained from the study of data available.

It is not expected that this report can present a final estimate of the situation regarding all the incidents reported. The data is still being studied by specialists in the fields of astrophysics and psychology, and further information is being collected to enable personnel evaluating project "Sign" incidents to determine possible explanations of some of the sightings. However, the report will furnish information on the present state of the investigation to staff personnel in this headquarters and in higher echelons, and to others who are required to assess the possibility of a threat to national security presented by the sighting of such large numbers of unidentified flying objects.

SUMMARY

The results of the study reviewed in this report are based on data derived from reports of 243 domestic and thirty (30) foreign incidents. Data from these incidents is being summarized, reproduced and distributed to agencies and individuals cooperating in the analysis and evaluation. Distribution has so far been accomplished on the summaries of ~~150~~ incidents and more are in process of reproduction at this time.172

A check list of items to be noted in reporting incidents has been prepared and distributed to government investigative agencies. The data obtained in reports received are studied in relation to many factors such as guided missile research activity, weather and other atmospheric sounding balloon launchings, commercial and military aircraft flights, flights of migratory birds, and other considerations, to determine possible explanations for sightings.

Based on the possibility that the objects are really unidentified and unconventional types of aircraft a technical analysis is made of some of the reports to determine the aerodynamic, propulsion, and control features that would be required for the object to perform as described in the reports. The objects sighted have been grouped into four classifications according to configuration:

1. Flying disks, i.e., very low aspect ratio aircraft.
2. Torpedo or cigar shaped bodies with no wings or fins visible in flight.
3. Spherical or balloon-shaped objects.
4. Balls of light

The first three groups are capable of flight by aerodynamic or aerostatic means and can be propelled and controlled by methods known to aeronautical designers. The fourth appears to have no physical form attached, but the means of support may not have been seen by the observer.

Approximately ~~ten~~ Twenty percent of the incidents have been identified as conventional aerial objects to the satisfaction of personnel assigned to Project "Sign" in this Command. It is expected that a study of the incidents in relation to weather and other atmospheric sounding balloons will provide solutions for an equivalent number. Verbal statements by an astro-physicist at Ohio State University and by psychologists of the Aero-Medical Laboratory of this Command, indicate the possibility of solving an appreciable number of the sightings as a result of their investigations. Elimination of incidents with reasonably satisfactory explanations will clarify the problem presented by a project of this nature.

The possibility that some of the incidents may represent technical developments far in advance of knowledge available to engineers and scientists of this country has been considered. No facts are available to personnel at this Command that will permit an objective assessment of this possibility. All information so far presented on the possible existence of space ships from another planet or of aircraft propelled by an advanced type of atomic power plant have been largely conjecture. Based on experience with nuclear power plant research in this country, the existence on Earth of such engines of small enough size and weight to have powered the objects described is highly improbable.

Reports of unidentified flying objects are not peculiar to the present time. In, "The Books of Charles Fort" by Tiffany Taylor, published in 1941 by Henry Holte & Co., New York, similar phenomena are described as having been sighted during past centuries. In the last war, numerous sightings of "balls of fire" in the air were reported by bomber crews.

[redacted]

[redacted]

RECOMMENDATIONS

Future activity on this project should be carried on at the minimum level necessary to record, summarize, and evaluate the data received on future reports and to complete the specialized investigations now in progress. When and if a sufficient number of incidents are solved to indicate that these sightings do not represent a threat to the security of the nation, the assignment of special project status to the activity could be terminated. Future investigations of reports would then be handled on a routine basis like any other intelligence work.

Reporting agencies should be impressed with the necessity for getting more factual evidence on sightings, such as photographs, physical evidence, radar sightings, and data on size and shape. Personnel sighting such objects should engage the assistance of others, when possible, to get more definite data. For example, military pilots should notify neighboring bases by radio of the presence and direction of flight of an unidentified object so that other observers, in flight or on the ground, could assist in its identification.

[redacted]

CONCLUSIONS

No definite and conclusive evidence is yet available that would prove or disprove the existence of these unidentified objects as real aircraft of unknown and unconventional configuration. It is unlikely that positive proof of their existence will be obtained without examination of the remains of crashed objects. Proof of non-existence is equally impossible to obtain unless a reasonable and convincing explanation is determined for each incident.

Many sightings by qualified and apparently reliable witnesses have been reported. However, each incident has unsatisfactory features, such as shortness of time under observation, distance from observer, vagueness of description or photographs, inconsistencies between individual observers, and lack of descriptive data, that prevents definite conclusions being drawn. Explanations, of some of the indidents revealed the existence of simple and easily understandable causes, so that there is the possibility that enough incidents can be solved to eliminate or greatly reduce the mystery associated with these occurrences.

Evaluation of reports of unidentified objects is a necessary activity of military intelligence agencies. Such sightings are inevitable, and under wartime conditions rapid and convincing solutions of such occurrences are necessary to maintain morale of military and civilian personnel. In this respect, it is considered that the establishment of procedures and training of personnel is in itself worth the effort expended on this project.

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DISCUSSION

Organization of Data on Incidents

Approximately 243 domestic incidents have been reviewed, at the present time. In each incident, the observors have been interrogated by investigators and the results have been analyzed by technical personnel.

Condensed summaries have been prepared for the list of incidents in sufficient quantity to make the basic information easily available to individuals or agencies having an authority or an interest in the project. (See Appendix A).

A detailed check list, compiled by technical personnel, indicating the basic elements of information, necessary for analysis of the individual incident, has been prepared and distributed to appropriate government agencies.

In order to identify ordinary and conventional objects, that have probably been included in the list of reported incidents, graphical methods have been applied, so as to present the basic data in such form that overall facts, implicit in the grouped data, will be made apparent. (See Appendix B).

The prepared graphical data includes:

(a) Charts concerning unidentified aerial objects, to indicate:

1. Type of object observed
2. Vicinity in which particular type of object was observed
3. Direction of flight

(b) Locations of guided missiles, research and related centers

(c) Locations of airlines, airfields, both military and commertial.

(d) Locations of radio beacon stations

(e) Known or projected radar stations from which reports and assistance may be derived

(f) Meteorological stations from which balloon release data, radiosonde or theodolite readings may be obtained

(g) Past, current, and projected celestial phenomena

(h) Flight paths of migratory birds

[redacted]

Psychological Analysis

A psychological analysis of the reported data is being prepared by Aero-Medical Laboratory, A.M.C., for the purpose of determining those incidents that are probably based upon errors of the human mind and senses. A preliminary verbal report from the professional psychologists indicates that a considerable number of incidents can be explained as ordinary occurrences that have been misrepresented, as the result of human errors.

The condition of "vertigo", well known to airplane pilots, as well as others, is considered to be an important factor in some of the reported incidents. "Vertigo" is defined from a medical viewpoint by Webster's Dictionary as "Dizziness or swimming of the head; a disturbance in which objects, though stationary, appear to move in various directions, and the person affected finds it difficult to maintain an erect posture. It may result from changes in the blood supply of the brain or from disease of the blood, eyes, ears, stomach, or other organs."

Accelerations, resulting from airplane maneuvers, together with space-orientation difficulties at night in an airplane, due to the lack of or strangeness of visual references, makes a condition of "vertigo" more likely to appear in personnel in night-flying aircraft than under more normal conditions. The fact that both pilot and co-pilot may report the same impressions is not complete proof of accuracy, since both individuals have experienced the same maneuvers and accelerations and have viewed the same lights and surroundings under the same optical conditions (including the same windshield and canopy glass).

A more complete dicussion of psychological factors is expected to be provided in a future status report. Quite probably, some of the incidents of fast, highly maneuvering "lights", reported by both air and ground observers, are the result of "vertigo" or optical illusions.

Strictly speaking, no engineering analysis of an incident should be initiated until the psychological analysis has been made and has shown that psychological factors cannot explain the observation.

Agencies, Outside Air Materiel Command, Supplying Information and Analysis

Specialist services, supplementary to those of Air Materiel Command technical offices, are being provided by a number of agencies.

The Air Weather Service has reviewed the list of incidents and has provided the information that twenty-four of them coincide, both with respect to location and time, with the release of weather balloons.

The Ohio State University has contracted with Air Materiel Command to supply astronomical services in an effort to identify meteors, planetoids and associated phenomena. Professor Hynek, Ohio State University Astro-Physicist and head of the University Observatory has undertaken to review the incident summary sheets. While this work has not yet been completed, Professor Hynek has reported verbally that he is satisfied that a number of the reported observations represent astro-physical phenomena.

Members of the Scientific Advisory Board to the Chief of Staff, USAF, who have provided consultant services to Project "Sign", include Dr. Irving Langmuir, Chief, General Electric Research and Dr. G. E. Valley of MIT.

A preliminary type of interview has been held between Dr. Langmuir and personnel of Project "Sign" during early stages of the project. It is intended to consult further with Dr. Langmuir in an effort to supplement present technical efforts toward identifying the reported objects.

Dr. G. E. Valley has displayed an active interest in Project "Sign", to the extent of reviewing the reported incidents and writing an overall type of analysis in which he groups the various objects and then analyzes each group from the standpoint of scientific feasibility. This analysis is provided as Appendix (C) to this report.

Inasmuch as various surmises have been advanced that some of the reported observations may have represented "space ships" or satellite vehicles, a special study has been initiated with the Rand Corporation, under the Rand-Project, to provide an analysis from this standpoint and also to provide fundamental information, pertaining to the basic design and performance characteristics that might distinguish a possible "space ship."

As a preliminary undertaking, the Rand Project has submitted a study by Dr. Lipp in which the possibility is explored of any planet in the known universe being in a physical and cultural position to allow the development and use of the "space ship". This study has been prepared in the form of a report that is presented as Appendix (D).

The Weather Bureau Library of the Department of Commerce has supplied information on "ball lightning". This was requested because of the belief by some persons that some of the observations may have represented "ball lightning". It appears that the subject of "ball lightning" occupies an undetermined status and authorities are not at all convinced that such a phenomena actually exists.

The Federal Bureau of Investigation has assisted Project "Sign" in a number of instances, both by investigations of the character and reliability of witnesses of incidents and by providing other investigative services.

Considerations Affecting Analysis and Evaluation

OPERATIONAL

Inasmuch as there is a distinct possibility that a number of the reported incidents represent domestic projects of a security-classified nature, the list of incidents has been submitted to higher echelons for review.

Since weather balloons, blimps, airplanes of unusual size or configuration, and guided missiles test vehicles may represent some of the observations, action has been taken to obtain information, concerning schedules and flights of such craft from the appropriate agencies.

In connection with the psychological studies being performed, extensive investigations, concerning the character and reliability of the reporting witnesses have been made.

TECHNICAL

A certain proportion of incidents appear to be real aircraft, though of unconventional configuration. In order to investigate the credibility of their existence the following factors must be considered in any technical analysis.

Aircraft

Method of Support (lift)

- Wings
- Fuselage Lift (Wingless)
- Rotor
- Vertical Jet
- Magnus Effect (rotating cylinder, cone or sphere, subjected to relative translational air velocity)
- Aerostatic (lighter-than-air craft)

Method of Propulsion (Thrust)

- Propeller-reciprocating engine combination
- Jet, rocket, ramjet (utilizing conventional fuels and oxidants or possibly atomic energy)
- Marodynamic (Katzmayer Effect - oscillating airfoils developing negative drag (thrust)

If an atomic energy powered engine were available, a small mass flow at a large velocity could accomplish the required lift and propulsive forces and the large energy expenditure would be of small importance.

However, the heat exchange requirements for the atomic-powered engine appear to demand physical dimensions of inordinate size that presently would preclude the use of this powerplant for aircraft.

In addition, manned aircraft would require an excessive percent weight of shielding for human protection, unless configurations of extremely large size were used. If unshielded craft were in operation, existing detection means would probably have indicated their presence.

Metallurgical limitations to date, limit the rate of converting the heat energy of the atomic source to useful propulsive work to such an ineffective order of magnitude that such a power system is quite unlikely from the standpoint of size and weight.

Stability

Aerodynamic (both static and dynamic through the use of aerodynamic surfaces and weight distribution).

Servo-mechanism (gyro or accelerometer - servomotor system)

Control

Movable surfaces in airflow or jet

Jet (flow control or swiveling types).

Possible Spaceships

World knowledge, techniques, and resources are considered to be presently adequate for the development of spaceships.

Distinguishing design and performance parameters are expected to be supplied as a special study by the Rand Project.

Probable Natural Phenomena

Astrophysical (meteors, comets, planetoids, etc.) Astrophysical analysis is expected to be performed by personnel of Ohio State University Research Foundation.

Electromagnetic (ball lightning, St. Elmo's Fire, Phosphorescence, corona, etc.).

Ordnance Items

While this analysis considers the reported objects largely from the standpoint of aircraft with requirements for speed and substantial duration of flight and range, it is entirely possible that the configurations reported in small sizes could serve as very useful ordnance items to take the place of (or supplement) such short-range weapons of ground (infantry) warfare as the trench mortar, hand grenade, etc. The small saucer-like, spinning,

disks, reportedly under development by the USSR with the aid of German Scientists, having explosive edges and launched by a compressed air catapult, (perhaps in the manner of clay pigeons projected by a trap mechanism) could possibly be ordnance articles. Also, such devices could be used by aircraft in attacking enemy airplane formations. In such cases, only a modest speed, short range, and limited flight duration would be required, hence the aerodynamic efficiency of the design would not be of very much importance.

Insufficient Information for Even 'Possible or Hypothetical Type Determination'.

Discredited Reports

Erroneous (See Discussion, Psychological Errors)

False

Technical Analysis of Various Configurations

The extreme lack of data for each of the incidents that have been reported makes it presently impossible to accurately identify any of the reported craft with respect to design and performance. Technical analysis must be made by considering possibilities and probabilities, which are expected to be proved or disproved only when complete data or physical specimens of aircraft (crash) are available. Unidentified aerial objects appear to be grouped as follows:

(1) Flying disks (saucers)
(2) Torpedo or Cigar Shaped Bodies (no wings or fins visible in flight)
(3) Spherical or Balloon-Shape Objects (capable of hovering, descending, ascending or travelling at high speed).
(4) Balls of light (no apparent physical form attached). Capable of maneuvering, climbing, and travelling at high speed.

The first three groups of objects are capable of flight through the atmosphere by means of aerodynamic and propulsion designs (to produce the required lift and thrust) that are readily conceivable by aeronautical designers. The stabilizing and control features that would be required, while more obscure, could conceivably be provided. The question arises, however, as to whether these configurations would develop much speed and allow a sufficient duration of flight and adequate range to be of practical use as aircraft.

Flying Disks

The disk or circular planform has not been used in representative aircraft, either military or civilian, for the reason that the induced drag, as determined by the Prandtl theory of lift, would

apparently be excessively high, since the aspect ratio of a circular planform is only 1.27. Extension of the Prandtl theory, has also shown that the maximum possible lift coefficient to be expected from such low aspect ratio planforms should also be poor. In addition, the relatively large mean aerodynamic chord would present difficult design problems, to achieve static longitudinal stability for airfoil sections having a significant center-of-pressure travel, or for airfoil sections of so-called "stable" type, when equipped with ailerons at the trailing edge.

In the very low aspect ratio range, the Prandtl theory is probably very inaccurate. Wind-tunnel tests of very low aspect ratio airfoils indicate much less induced drag increase than expected from theory and also demonstrate very high maximum lift coefficient accompanied by extremely high stalling angles. However, in general the induced drag of very low aspect ratio wings is much larger than the induced drag of conventional aircraft wings, a condition which would adversely affect all performance values in flight conditions which require medium and high lift coefficients. Thus, performance in climb, at altitude, and for long-range conditions would be relatively poor, although high speed would be little affected.

Notwithstanding the predicted aerodynamic disadvantages of circular planform wings, quite a number of experimental efforts have been made to use this configuration - and not all of them by persons ignorant of aerodynamic fundamentals. Experimental wind-tunnel work at the NACA (1933) showed both maximum lift coefficients and stall characteristics much more favorable than could be anticipated.

The problem of static longitudinal stability could possibly, be solved by the use of a stable airfoil section of the reflexed trailing edge type with wing tip ailerons (perhaps floating) aerodynamically independent of the wing.

At supersonic speeds, where the induced drag is small, the circular planform offers the probability of reduced drag, characteristic of low aspect ratio airfoils in the supersonic range. Also the circular planform presents a swept-back leading edge (of variable sweep along the span), which should result in a reduced effective Mach Number, with attendant reduced drag for a certain supersonic speed range.

No definite information has been received on the method of propulsion used on flying disks which have been sighted. However, because of distance factors involved in the sightings it is quite possible that either propellers or jet propulsion could have been employed without being noted by the observer.

Flying Fuselages (Torpedo or Cigar-Shaped Body)

While the cigar or torpedo-shaped body represents an efficient form for the fuselage of an airplane or the body of a guided missile,

in neither case has it been used as a primary lift-producing surface. However, an extension of the Prandtl theory of lift indicates that a fuselage of the dimensions reported by the Eastern Airlines pilots Whited and Chiles in the Montgomery, Alabama, incident could support a load comparable to the weight of an aircraft of this size at flying speeds in the subsonic range. The Prandtl theory probably gives very conservative values of maximum lift for bodies of this shape. German experience indicates that the maximum lift may be twice as high as that given by the theory.

Although the craft sighted by Whited and Chiles was reported to be without wings and fins, it is possible that it could have been equipped with extensible wings for take-off and landing, contained within the fuselage in cruising flight.

This type of aircraft could also be partially supported in the take-off and landing condition by the vertical component of the jet thrust, if the landing and take-off took place with the fuselage axis, or the jet stream direction in a vertical or nearly vertical altitude. The further possibility that an extensible rotor, concealed within the fuselage, could have been used, would provide another method for landing and take-off that would allow wingless flight at very high speed. Such a design could result in a relatively large duration of flight and corresponding range.

While no stabilizing fins were apparent on the "flying fuselage" reported by Whited and Chiles, it is possible that vanes within the jet, operated by a gyro-servo system could have provided static stability, longitudinally, directionally and laterally. The same vanes could also have been used for accomplishing static balance or trim, as well as control for maneuvering.

The above discussion regarding weight, controllability, stability, etc. is not intended to represent deductions regarding the exact nature of the torpedo or cigar-shaped aircraft which were sighted by the airline pilots, Whited and Chiles, and others. They are merely statements of possibilities, which are intended to show that such an aircraft could support and control itself by aerodynamic means.

The propulsive system of this type of vehicle would appear to be a jet or rocket engine. The specific fuel consumption of engines to this type would be rather high. This, coupled with the fact that aerodynamic lift on such a body would be accompanied by high drag, places a serious limitation on the range of this aircraft for any particular gross weight. If this type of unidentified aerial object has extremely long range, it is probable that the method of propulsion is one which is far in advance of presently known engines.

Round Objects (Spherical and Balloon-Shaped Objects)

Spherical or balloon-shaped objects, are not usually considered as efficient aircraft. Not only would the drag of such bodies be high, but the energy expenditure that would be required to develop lift by aerodynamic means would be excessive. The only conceivable

means of producing lift for such a body, other than by aerostatic (simple buoyancy) means, would be by rotation of the sphere with translational motion relative to the air; or by discharging a stream of air vertically downward. Aerodynamic flight could be accomplished with a rotating sphere, provided the detailed design problems, including stability and control were worked out. The methods, using a blower system or jets, would require relatively greater amounts of energy and while they could be used for flights of very short range and duration, would not ordinarily be considered as practical by aeronautical designers.

The obvious explanation for most of the spherical shaped objects is that they are meteorological or similar type balloons. This, however, does not explain reports that they travel at high speed or maneuver rapidly. It is possible that the movement of the objects was some kind of an optical illusion, or that movement for a brief period due to a gas leak in the balloon was exaggerated by observers.

Balls of Light

No reasonable hypothesis of the true nature of balls of light, such as that reported by Lt. German at Fargo, N. Dakota, has been developed that explains the behavior reported. The most reasonable explanation is that the lights were suspended from balloons, or other means of support, not visible at night, and the violent maneuvers reported are due to illusion.

Possibility of Scientific Developments in Advance of Knowledge in this Country.

Consideration has been given to the possibility that these unidentified aircraft represent scientific developments beyond the level of knowledge attained in this country. Since this is probably the most advanced of the industrial nations on the earth, and our interest in scientific developments throughout the world is very active, it would be necessary for any other country to conduct research and development work in extreme secrecy for any such project to have reached such an advanced state of development without a hint of its existence becoming known here. The only nation on earth with extensive technical resources which has such rigid security, is the U.S.S.R. An objective evaluation of the ability of the Soviets to produce technical developments so far in advance of the rest of the world results in the conclusion that the possibility is extremely remote. Most of the successful Soviet aeronautical developments have been produced by utilizing experience of other nations, some of them being very close copies, so it is very unlikely that they have developed the propulsion and controldevices necessary to make these objects perform as described.

Another possibility is that these aerial objects are visitors from another planet. Little is known of the probabilities of life on other planets, so there is no basis on which to judge the possibility that civilizations far in advance of ours exist outside the earth. The commentary on this possibility by Dr. James Lipp of the Rand Project in Appendix D , indicates that this solution of the mystery connected with the sighting of unidentified flying

objects is extremely improbable. Pending elimination of all other solutions or definite proof of the nature of these objects, this possibility will not be further explored.

APPENDIX "A"

Distribution of Incident Summaries:

Air Materiel Command

Aero Medical Laboratory (MCREXD)
Weather Liaison (MCLAWS)
Research and Development (MCREOS)
Electronic Plans (MCREEP)
Technical Intelligence, Technical Sections (MCI)

Other Agencies

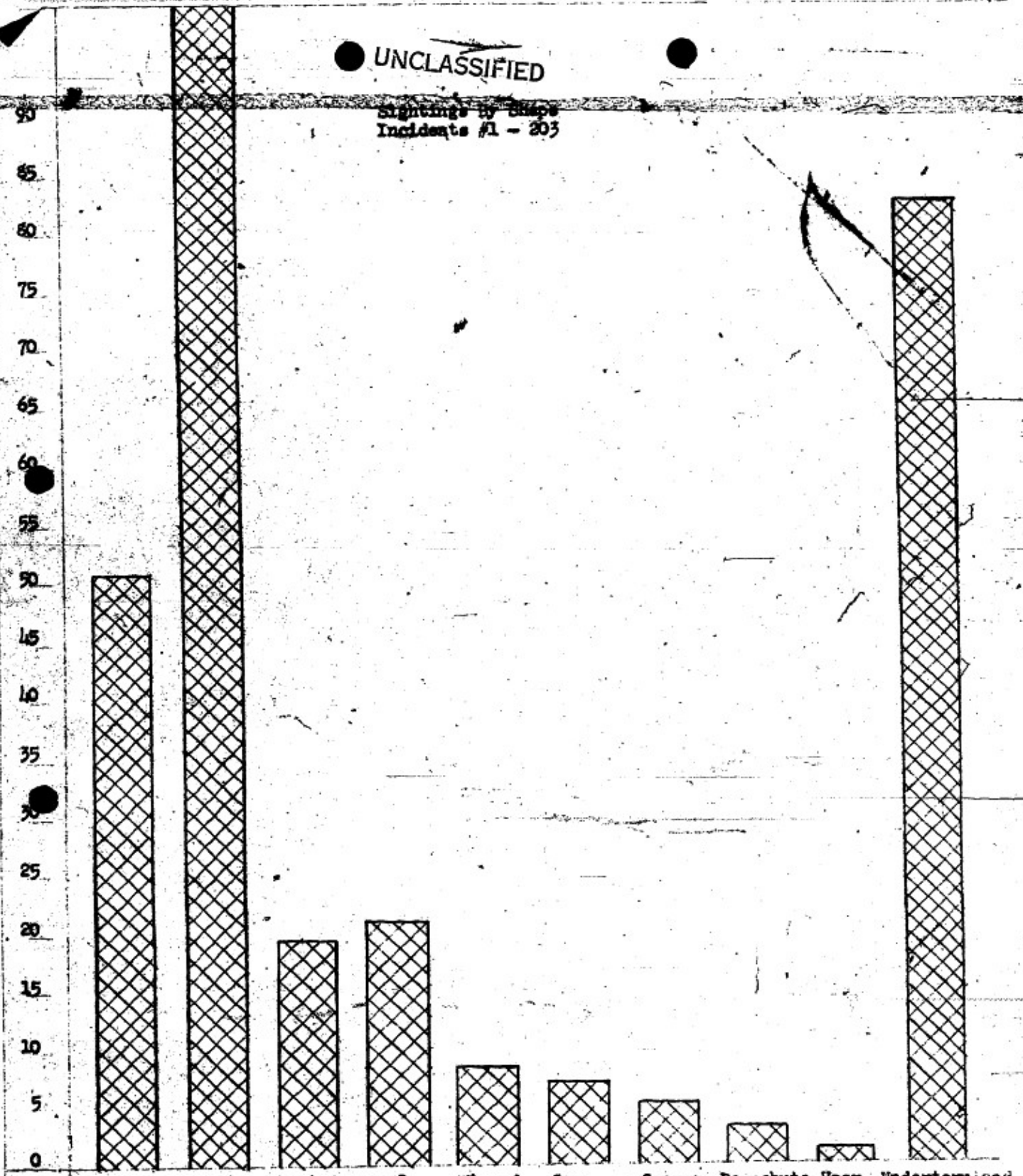
Directorate of Intelligence, Hq., USAF (AFOIR)
Office of Naval Intelligence (ONI)
Cambridge Field Station, Cambridge, Mass.
Air Weather Services, Andrews AFB, Washington, D. C.
Ohio State University, Dr. Hynek
Rand Inc., Rand Project (USAF)
Scientific Advisory Board (USAF) Dr. Valley

S-11750

"APPENDIX B"

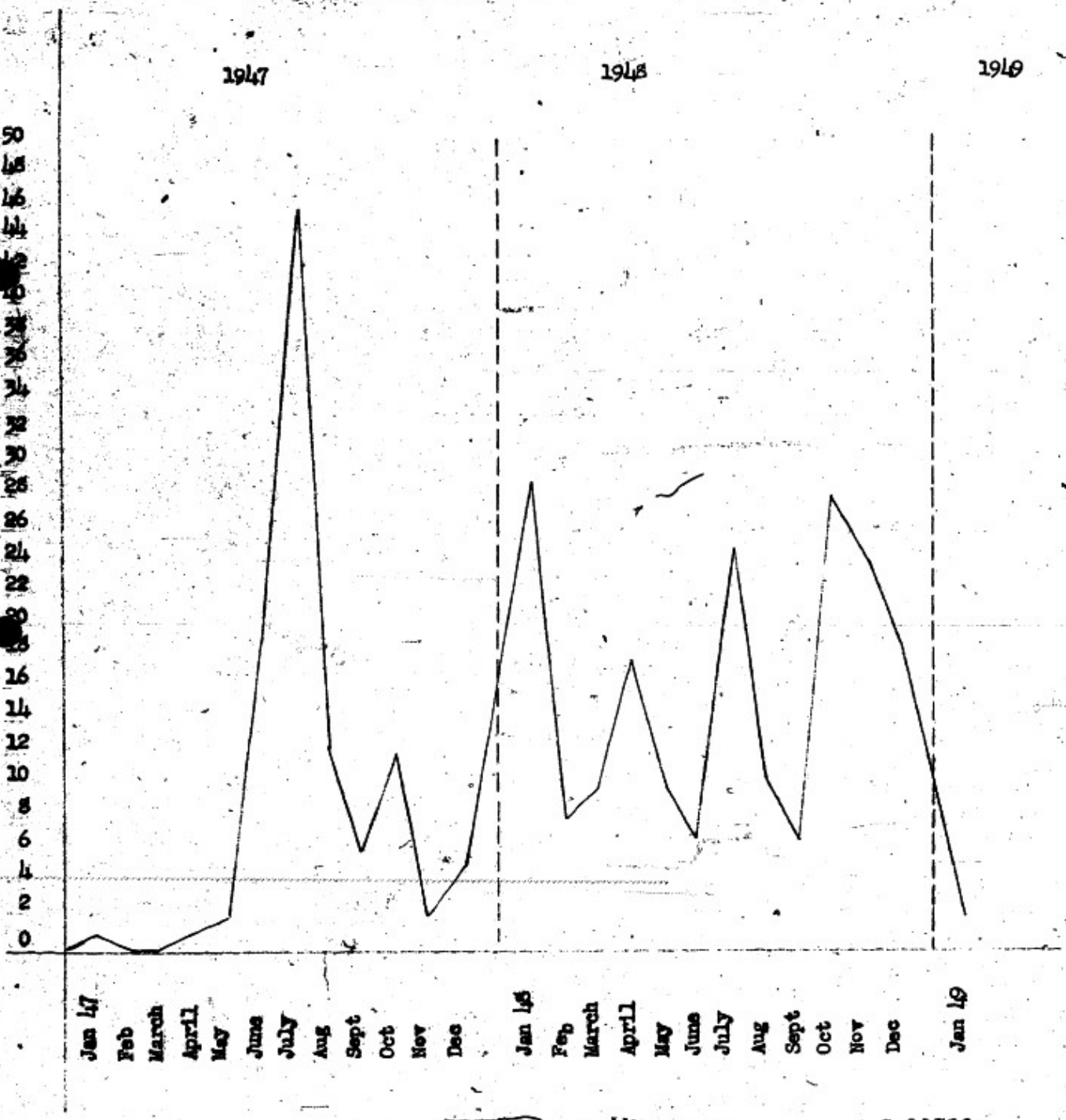
UNCLASSIFIED

Sightings by Shape
Incidents #1 - 203



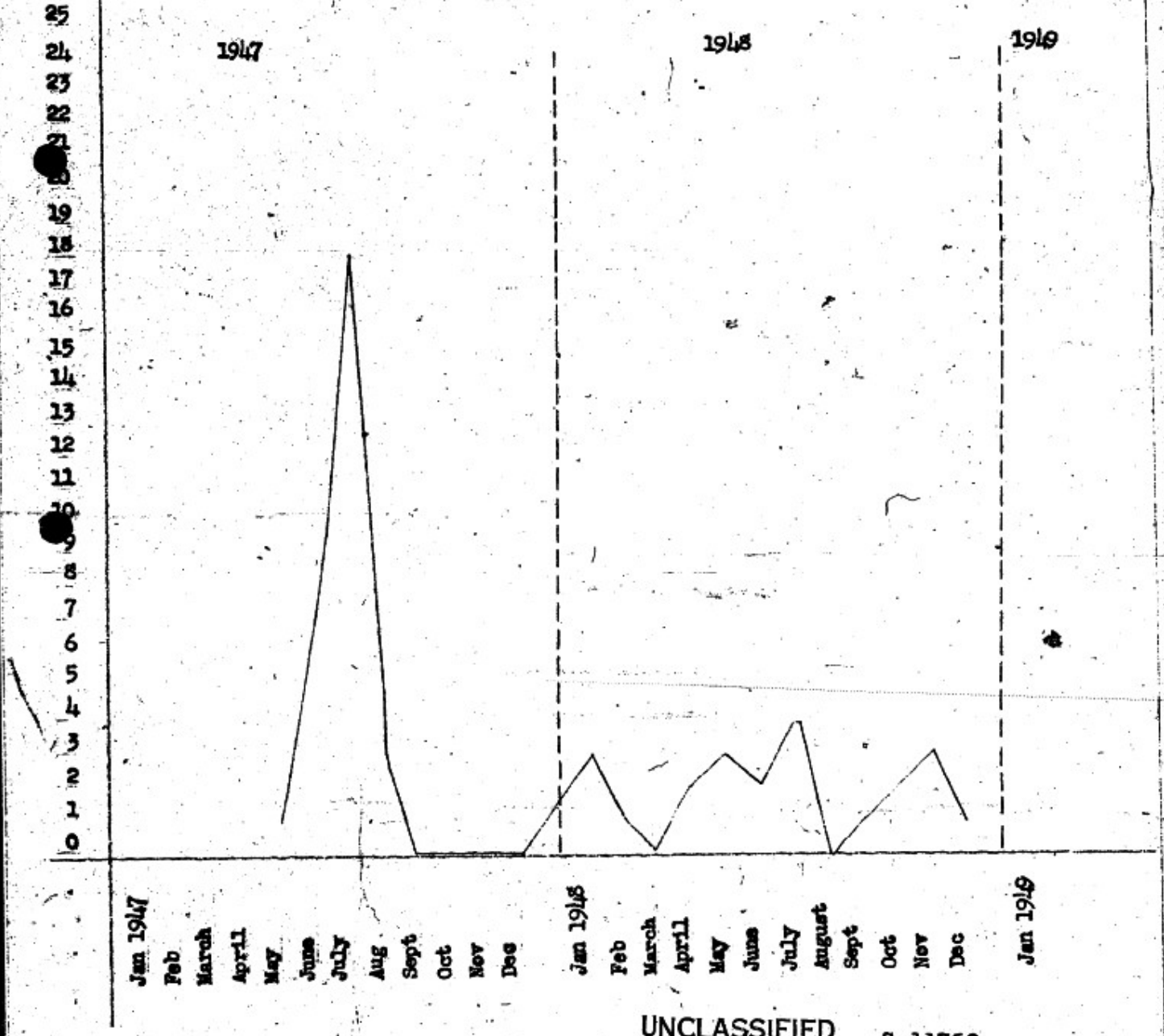
UNCLASSIFIED S-11750

All Shapes Incidents 1-233
Intensity of Sightings - By Date

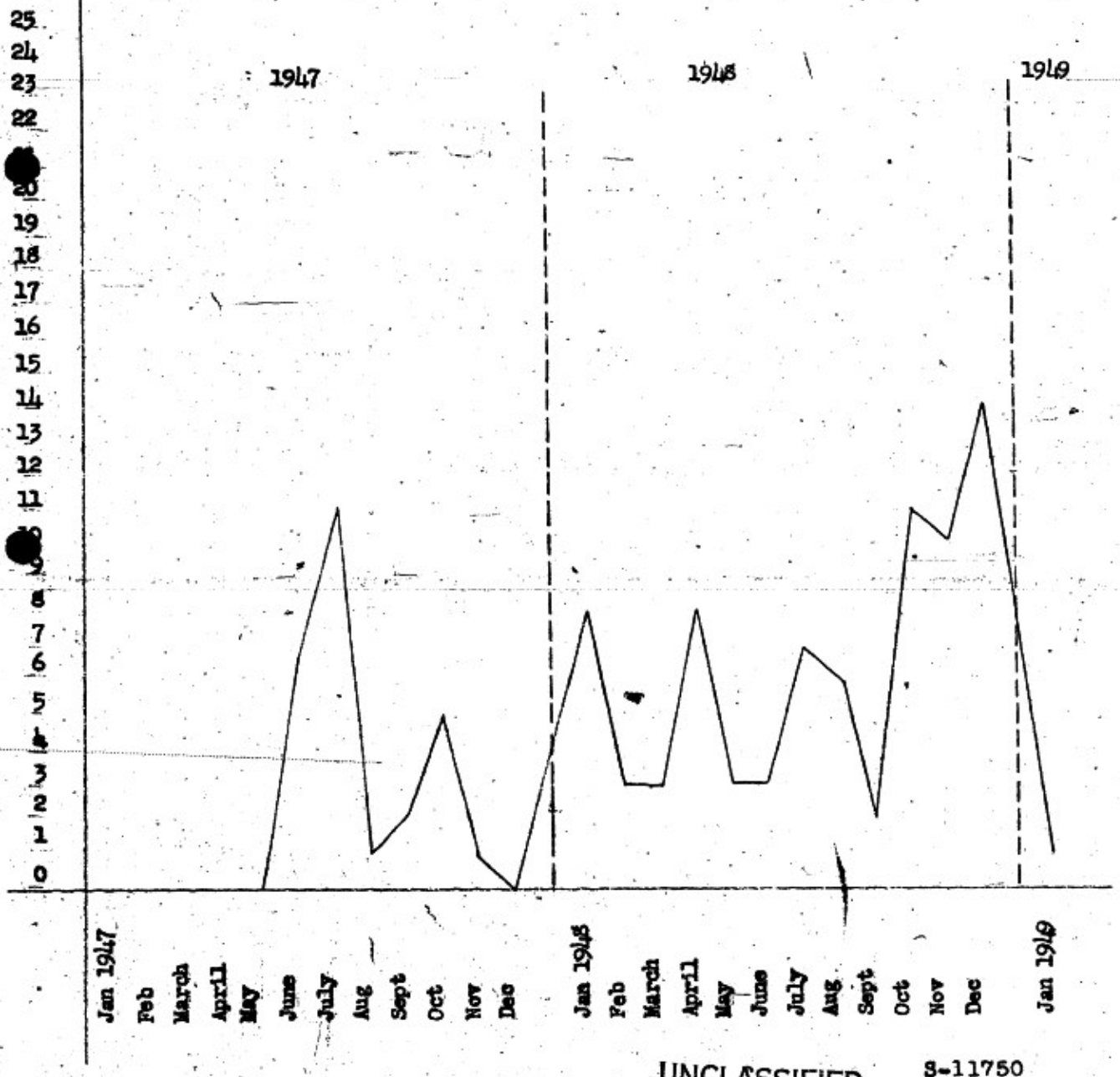


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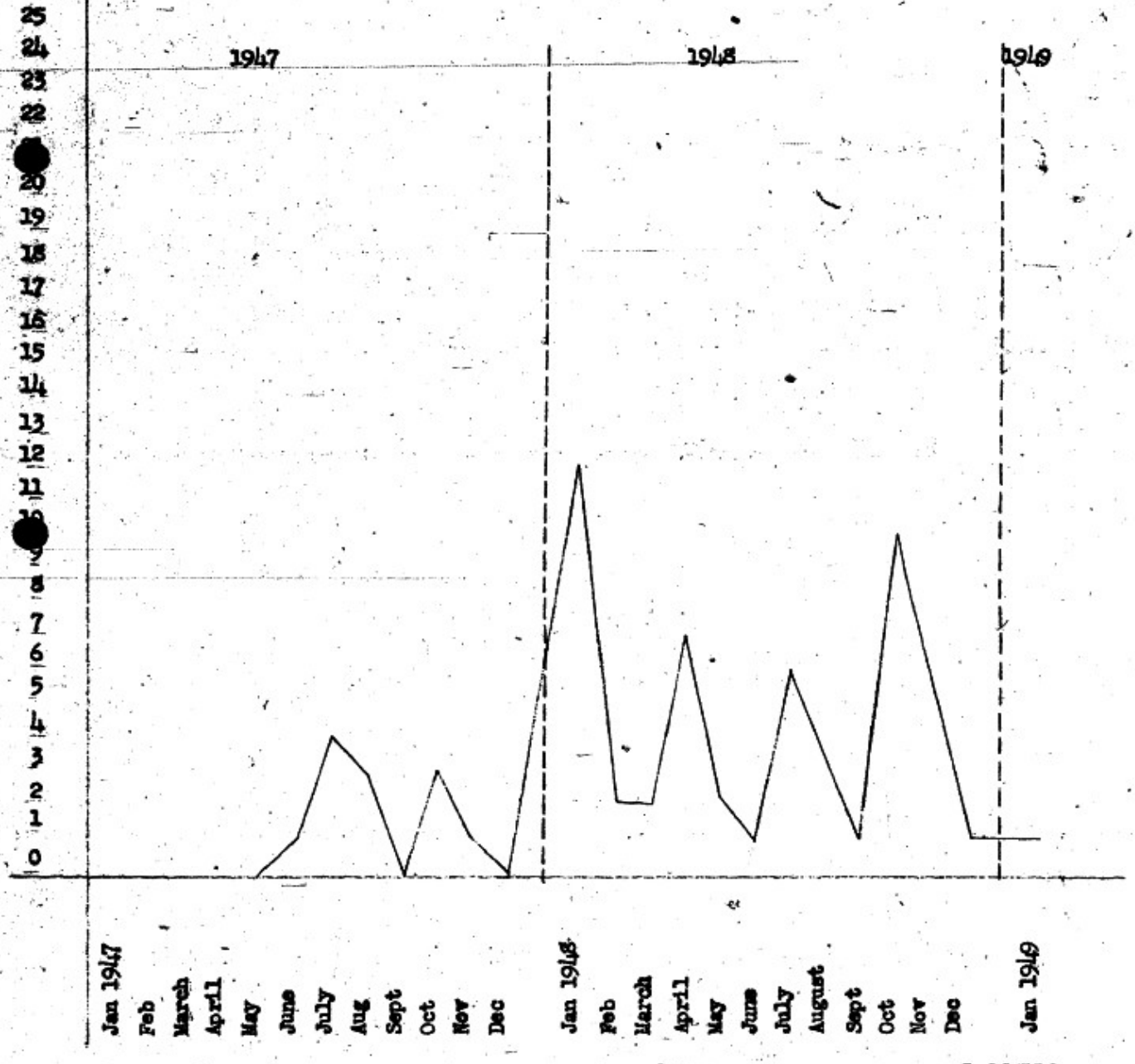
Disc Shapes - Incidents - 1-233
Intensity of Sightings - By Date



Ball Shape Incidents 1-233
Intensity of Sightings by Da.s

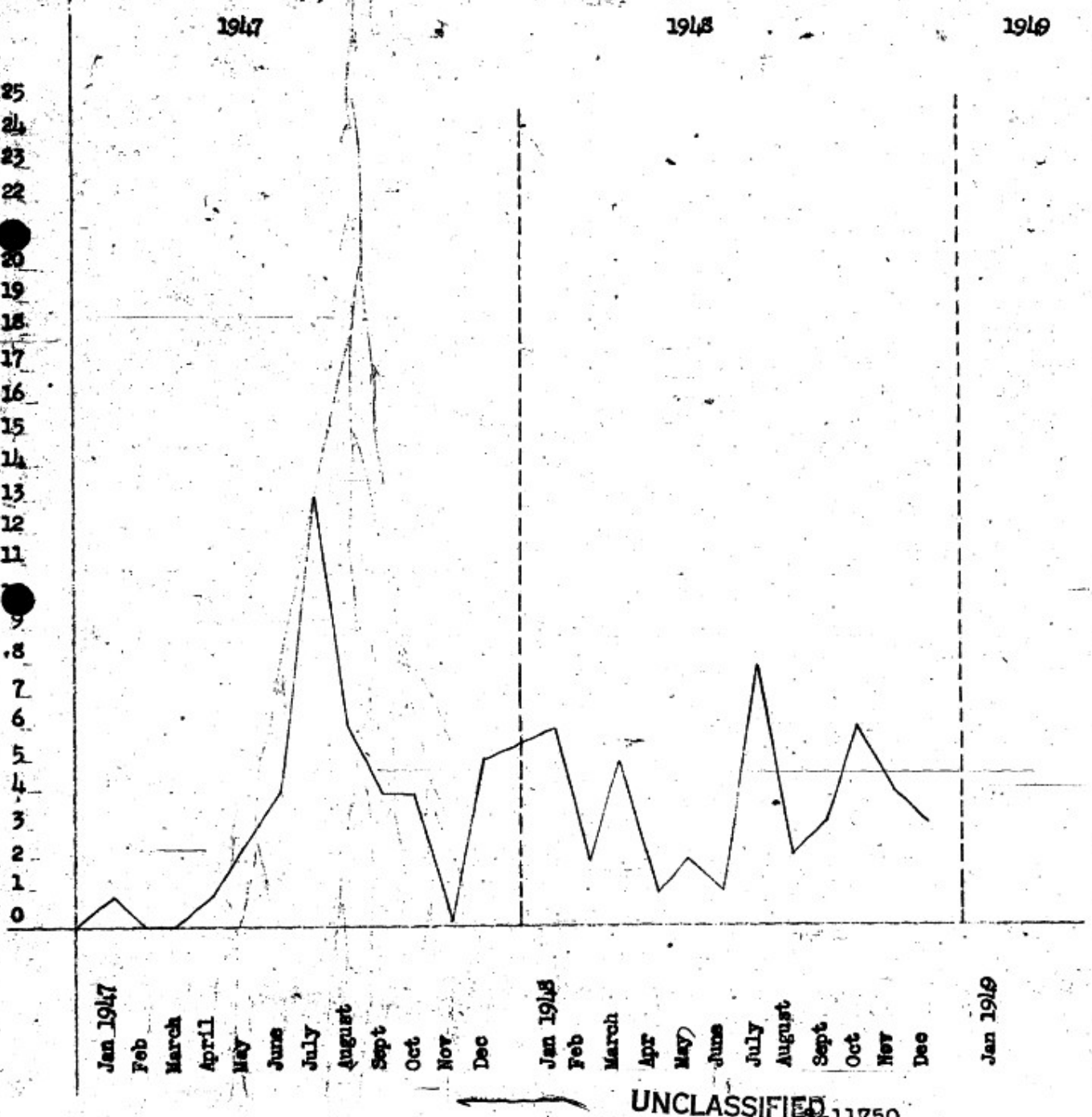


Miscellaneous Shapes (Other than Ball, Disc & Undetermined)
Incidents 1-233
Intensity of Sightings - By Date



S-11750

Undetermined Shapes - Incidents 1-233
Intensity of Sightings - By Date



APPENDIX "C"

Some Considerations Affecting the Interpretation of Reports of Unidentified Flying Objects

By

G. E. Valley, Member Scientific Advisory Board,
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The writer has studied summary abstracts and comments pertaining to unidentified flying objects, which were forwarded by Air Force Intelligence. These remarks are divided into three main parts: the first part is a short summary of the reports; the second part consists of a general survey of various possibilities of accounting for the reports; the third part contains certain recommendations for future action.

PART I -- SHORT SUMMARY OF OBSERVATIONS

The reports can be grouped as follows:

Group 1 -- The most numerous reports indicate the daytime observation of metallic disk-like objects, roughly in diameter ten times their thickness. There is some suggestion that the cross section is assymetrical and rather like a turtle shell. Reports agree that these objects are capable of high acceleration and velocity; they often are sighted in groups, sometimes in formation. Sometimes they flutter.

Group 2 -- The second group consists of reports of lights observed at night. These are also capable of high speed and acceleration. They are less commonly seen in groups. They usually appear to be sharply defined luminous objects.

Group 3 -- The third group consists of reports of various kinds of rockets, in general appearing somewhat like V-2 rockets.

Group 4 -- The fourth group contains reports of various devices which, in the writer's opinion, are sounding balloons of unusual shape such as are made by the General Mills Company to Navy contract.

Group 5 -- The fifth group includes reports of objects in which little credence can be placed.

General Remarks

In general, it is noted that few, if any, reports indicate that the observed objects make any noise or radio interference. Nor are there many indications of any material affects or physical damage attributable to the observed objects.

Summary -- PART I

This report will consider mainly the reports of Groups 1 and 2.

PART II -- ON POSSIBLE EXPLANATIONS OF THE REPORTS

Section A -- What can be deduced concerning the nature of an unknown aerial object from a single sighting?

Here, there are two problems: first, how much can be deduced concerning the nature of the objects from geometrical calculations alone; second, how much more can be deduced if, in addition, it is assumed that the objects obey the laws of nature as we know them.

Concerning the first problem, it can be stated that only ratios of lengths, and rates of change of such ratios, can be accurately determined. Thus, the range and size of such objects cannot be determined; and it is noticeable that reports of size of the observed objects are widely at variance. However, angles, such as the angle subtended by the object, can be observed. Likewise there is fair agreement among several observers that the diameter of the objects of Group 1 is about ten times their thickness. Although velocity cannot be determined, angular velocity can be, and in particular the flutter frequency could, in principle, be determined.

All that can be concluded about the range and size of the objects, from geometrical considerations alone, is: 1) from the fact that estimated sizes vary so widely, the objects were actually either of different sizes, or more likely, that they were far enough from the observers so that binocular vision produced no stereoscopic effect; this only means that they were farther off than about thirty feet; 2) since objects were seen to disappear behind trees, buildings, clouds, etc., they are large enough to be visible at the ranges of those recognizable objects.

Now, it is obviously of prime importance to estimate the size and mass of the observed objects. This may be possible to some extent if it is permissible to assume that they obey the laws of physics. Since the objects have not been observed

to produce any physical effects, other than the one case in which a cloud was evaporated along the trajectory, it is not certain that the laws of mechanics, for instance, would be sufficient.

But suppose that mechanical laws alone are sufficient, then the following example is sufficient proof that at least a length could, in principle, be determined: suppose a simple pendulum were observed suspended in the sky; then after observing its frequency of oscillation, we could deduce from the laws of mechanics its precise length.

This suggests that something could be deduced from the observed fluttering motion of some of the objects of Group 1. Assume that we know the angular frequency and angular amplitude of this fluttering motion (they can be measured in principle from a motion picture). Then for purposes of calculation assume the object to be thirty feet in diameter, to be as rigid as a normal aircraft wing of 30-foot span, to be constructed of material of the optimum weight-strength ratio and to be a structure of most efficient design. It is now possible to calculate how heavy the object must be merely to remain rigid under the observed angular motion. Let the calculation be made for a plurality of assumed sizes 1, 2, 4, 8, 16, 32, 64 ----- up to say 200 feet, and let calculated mass be plotted versus assumed size. The non-linear character of the curve should indicate an approximate upper limit to the size of the object.

If, in addition, it is assumed that the flutter is due to aerodynamic forces, it is possible that more precise information could be obtained.

The required angular data can probably be extracted from witnesses most reliably by the use of a demonstration model which can be made to oscillate or flutter in a known way.

Summary -- PART II, Section A

Geometrical calculations alone cannot yield the size of objects observed from a single station; such observation together with the assumption that the objects are essentially aircraft, can be used to set reasonable limits of size.

Section B -- The possibility of supporting and propelling a solid object by unusual means.

Since some observers have obviously colored their reports with talk of rays, jets, beams, space-ships, and the like, it is well to examine what possibilities exist along these lines. This is also important in view of the conclusions of PART II, Section A, of this report.

Method I -- Propulsion and support by means of "rays" or "beams".

By "rays" or "beams" are meant either purely electromagnetic radiation or else radiation which is largely corpuscular like cathode-rays or cosmic-rays or cyclotron-beams.

Now, it is obvious that any device propelled or supported by such means is fundamentally a reaction device. It is fundamental in the theory of such devices that a given amount of energy is most efficiently spent if the momentum thrown back or down is large. This means that a large mass should be given a small acceleration -- a theorem well understood by helicopter designers.

The beams or rays mentioned do the contrary, a small mass is given a very high velocity, consequently enormous powers, greater than the total world's power capacity, would be needed to support even the smallest object by such means.

Method II -- Direct use of Earth's Magnetic Field

One observer (incident 68) noticed a violent motion of a hand-held compass. If we assume from this that the objects produced a magnetic field, comparable with the Earth's field; namely, 0.1 gauss, and that the observer found that the object subtended an angle θ at his position, then the ampere-turns of the required electromagnet is given by:

$$ni = \frac{30R}{\theta^2}$$ where R is the range of the object.

For instance, if R is one kilometer and the object is 10 meters in diameter, then ni $\neq$ 1 billion ampere-turns.

Now, if the object were actually only 10 meters away and were correspondingly smaller; namely, 10 cm in diameter, it would still require 10 million ampere-turns.

These figures are a little in excess of what can be conveniently done on the ground. They make it seem unlikely that the effect was actually observed.

Now, the Earth's magnetic field would react on such a magnet to produce not only a torque but also a force. This force depends not directly on the Earth's field intensity but on its irregularity or gradient. This force is obviously minute since the change in field over a distance of 10 meters (assumed diameter of the object) is scarcely measureable, moreover the gradient is not predictable but changes due to local ore deposits. Thus, even if the effect were large enough to use, it would still be unreliable and unpredictable.

Method III -- Support of an electrically charged object by causing it to move transverse to the Earth's magnetic field

A positively charged body moving from west to east, or a negatively charged body moving from East to West will experience an upward force due to the Earth's magnetic field.

A sphere 10 meters diameter moving at a speed of one kilometer/second would experience an upward force of one pound at the equator if charged to a potential of 5×10^{12} volts. This is obviously ridiculous.

Section D -- The anti gravity shield

It has been proposed, by various writers, perhaps first by H. G. Wells, that it might be possible to construct a means of shielding a massive body from the influence of gravity. Such an object would then float. Recently, there appeared in the press a notice that a prominent economist has offered to support research on such an enterprise.

Obviously, conservation of energy demands that considerable energy be given the supported object in order to place it on the shield. However, this amount of energy is in no way prohibitive, and furthermore it can be gotten back when the object lands.

Aside from the fact that we have no suggestions as to how such a device is to be made, the various theories of general relativity all agree in assuming that gravitational force and force due to acceleration are indistinguishable, and from this assumption the theories predict certain effects which are in fact observed. The assumption, therefore, is probably correct, and a corollary of it is essentially that only by means of an acceleration can gravity be counteracted. This, we can successfully do for instance by making an artificial satellite, but this presumably is not what has been observed.

Summary -- PART II, Section B

Several unorthodox means of supporting or propelling a solid object have been considered, all are impracticable. This finding lends credence to the tentative proposed assumption of Part II, that the objects are supported and propelled by some normal means, or else that they are not solids. No discussion of the type of Part II, Section B, can, in principle, of course, be complete.

Section C -- Possible causes for the reports.

Classification I -- Natural terrestrial phenomena

1. The observations may be due to some effect such as

ball lightning. The writer has no suggestions on this essentially meteorological subject.

2. The objects may be some kind of animal.

Even in the celebrated case of incident 172 where the light was chased by a P51 for half an hour and which was reported by the pilot to be intelligently directed, we can make this remark. For considering that an intelligence capable of making so remarkable device would not be likely to play around in so idle a manner as described by the pilot.

In this connection, it would be well to examine if some of the lights observed at night were not fire-flies.

3. The observed objects may be hallucinatory or psychological in origin. It is of prime importance to study this possibility because we can learn from it something of the character of the population: its response under attack; and also something about the reliability of visual observation.

One would like to assume that the positions held by many of the reported observers guarantee their observations. Unfortunately, there were many reports of curious phenomena by pilots during the war -- the incident of the fire-ball fighters comes to mind. Further, mariners have been reporting sea-serpents for hundreds of years yet no one has yet produced a photograph.

It would be interesting to tabulate the responses to see how reliable were the reports on the Japanese balloons during the war. There we had a phenomenon proven to be real.

It is interesting that the reports swiftly reach a maximum frequency during the end of June 1947 and then slowly taper off. We can assume that this is actually an indication of how many objects were actually about, or, quite differently, we can take this frequency curve as indicating something about mass psychology.

This point can be tested. Suppose the population is momentarily excited; how does the frequency of reports vary with time? A study of crank letters received after the recent publicity given to the satellite program should give the required frequency distribution.

It is probably necessary but certainly not sufficient that the unidentified-object curve and the crank-letter curve should be similar in order for the flying disks to be classed as hallucinations.

A large-scale experiment was made at the time of Orson Welles' "Martian" broadcast. Some records of this must persist in newspaper files.

Classification II -- Man-made terrestrial phenomena

1. The objects may be Russian aircraft. If this were so, then the considerations of Sections A and B indicate that we would have plenty to worry about. It is the author's opinion that only an accidental discovery of a degree of novelty never before achieved could suffice to explain such devices. It is doubtful whether a potential enemy would arouse our curiosity in so idle a fashion.

Classification III -- Extra terrestrial objects

1. Meteors: It is noteworthy that the British physicist Lovell writing in "Physics Today" mentions the radar discovery of a new daytime meteorite stream which reached its maximum during June 1947. The reported objects lose little of their interest, however, if they are of meteoritic origin.

2. Animals: Although the objects as described act more like animals than anything else, there are few reliable reports on extra-terrestrial animals.

3. Space Ships: The following considerations pertain:

a. If there is an extra terrestrial civilization which can make such objects as are reported then it is most probable that its development is far in advance of ours. This argument can be supported on probability arguments alone without recourse to astronomical hypotheses.

b. Such a civilization might observe that on Earth we now have atomic bombs and are fast developing rockets. In view of the past history of mankind, they should be alarmed. We should, therefore, expect at this time above all to behold such visitations.

Since the acts of mankind most easily observed from a distance are A-bomb explosions we should expect some relation to obtain between the time of A-bomb explosions, the time at which the space-ships are seen, and the time required for such ships to arrive from and return to home-base.

PART III -- RECOMMENDATIONS

1. The file should be continued.

2. A meteorologist should compute the approximate energy

required to evaporate as much cloud as shown in the incident 26 photographs. Together with an aerodynamicist he should examine whether a meteorite of unusual shape could move as observed.

3. The calculations suggested in Part II, Section A, should be estimated by an aerodynamicist with such changes as his more detailed knowledge may suggest.

4. The mass-psychology studies outlined in Part II, Section C, Classification I 3 should be carried out by a competent staff of statisticians and mass-psychologists.

5. Interviewing agents should carry objects or moving pictures for comparison with reporter's memories. These devices should be properly designed by a psychologist experienced in problems pertaining to aircraft and design of aircraft-control equipment so that he shall have some grasp of what it is that is to be found out. If the Air Force has reason to be seriously interested in these reports, it should take immediate steps to interrogate the reporters more precisely.

6. A person skilled in the optics of the eye and of the atmosphere should investigate the particular point that several reports agree in describing the objects as being about ten times as wide as they are thick; the point being to see if there is a plurality of actual shapes which appear so, under conditions approaching limiting resolution or detectable contrast.

APPENDIX "D"

13 December 1948 AI-1009

Brigadier General Putt
United States Air Force
Director of Research and Development
Office, Deputy Chief of Staff, Materiel
Washington 25, D. C.

Dear General Putt:

Please refer to your letter of 18 November 1948 relative to the "flying object" problem and to Mr. Collbohm's reply dated 24 November 1948. In paragraph (b) of the reply, Mr. Collbohm promised (among other things) to send a discussion of the "special design and performance characteristics that are believed to distinguish space ships."

This present letter gives, in very general terms, a description of the likelihood of a visit from other worlds as an engineering problem and some points regarding the use of space vehicles as compared with descriptions of the flying objects. Mr. Collbohm will deliver copies to Colonel McCoy at Wright-Patterson Air Base during the RAND briefing there within the next few days.

A good beginning is to discuss some possible places of origin of visiting space ships. Astronomers are largely in agreement that only one member of the Solar system (besides Earth) can support higher forms of life. It is the planet Mars. Even Mars appears quite desolate and inhospitable so that a race would be more occupied with survival than we are on Earth. Reference 1 gives adequate descriptions of conditions on the various planets and satellites. A quotation from Ref. 1 (p. 229) can well be included here.

> "Whether intelligent beings exist to appreciate these splendors of the Martian landscape is pure speculation. If we have correctly reconstructed the history of Mars, there is little reason to believe that the life processes may not have followed a course similar to terrestrial evolution. With this assumption, three general possibilities emerge. Intelligent beings may have protected themselves against the excessively slow loss of atmosphere, oxygen and water, by constructing homes and cities* with the physical conditions scientifically con-

*"Not too large or they might be visible. Perhaps underground, where the atmospheric pressure would be greater and where the temperature extremes would be reduced."

trolled. As a second possibility, evolution may have developed a being who can withstand the rigors of the Martian climate. Or the race may have perished.

"These possibilities have been sufficiently expanded in the pseudo-scientific literature to make further amplification superfluous. However, there may exist some interesting restrictions to the anatomy and physiology of a Martian. Rarity of the atmosphere, for example, may require a completely altered respiratory system for warm-blooded creatures. If the atmospheric pressure is much below the vapor pressure of water at the body temperature of the individual, the process of breathing with our type of lungs becomes impossible. On Mars the critical pressure for a body temperature of 98.6°F. occurs when a column of the atmosphere contains one sixth the mass of a similar column on the Earth. For a body temperature of 77°F. the critical mass ratio is reduced to about one twelfth, and at 60°F. to about one twenty-fourth. These critical values are of the same order as the values estimated for the Martian atmosphere. Accordingly the anatomy and physiology of a Martian may be radically different from ours - but this is all conjecture.

"We do not know the origin of life, even on the Earth. We are unable to observe any signs of intelligent life on Mars. The reader may form his own opinion. If he believes that the life force is universal and that intelligent beings may have once developed on Mars, he has only to imagine that they persisted for countless generations in a rare atmosphere which is nearly devoid of oxygen and water, and on a planet where the nights are much colder than our arctic winters. The existence of intelligent life on Mars is not impossible but it is completely unproven."

It is not too unreasonable to go a step further and consider Venus as a possible home for intelligent life. The atmosphere, to be sure, apparently consists mostly of carbon dioxide with deep clouds of formaldehyde droplets, and there seems to be little or no water. Yet living organisms might develop in chemical environments that are strange to us: the vegetable kingdom, for example, operates on a fundamentally different energy cycle from Man. Bodies might be constructed and operated with different chemicals and other physical principles than any of the creatures we know. One thing is evident: fishes, insects, and mammals all manufacture within their own bodies complex chemical compounds that do not exist as minerals. To this extent, life is self-sufficient and might well adapt itself to any environment within certain limits of temperature (and size of creature).

Venus has two handicaps relative to Mars. Her mass, and gravity, are nearly as large as for the Earth (Mars is smaller) and her

cloudy atmosphere would discourage astronomy, hence space travel. The remaining Solar planets are such poor prospects that they can be ignored.

In the next few paragraphs, we shall speak of Mars. It should be understood that most of the remarks apply equally well to Venus.

Various people have suggested that an advanced race may have been visiting Earth from Mars or Venus at intervals from decades to eons. Reports of objects in the sky seem to have been handed down through the generations. If this were true, a race of such knowledge and power would have established some form of direct contact. They could see that Earth's inhabitants would be helpless to do interplanetary harm. If afraid of carrying diseases home, they would at least try to communicate. It is hard to believe that any technically accomplished race would come here, flaunt its ability in mysterious ways and then simply go away. To this writer, long-time practice of space travel implies advanced engineering and science, weapons and ways of thinking. It is not plausible (as many fiction writers do) to mix space ships with broadswords. Furthermore, a race which had enough initiative to explore among the planets would hardly be too timid to follow through when the job was accomplished.

One other hypothesis needs to be discussed. It is that the Martians have kept a long-term routine watch on Earth and have been alarmed by the sight of our A-bomb shots as evidence that we are warlike and on the threshold of space travel. (Venus is eliminated here because her cloudy atmosphere would make such a survey impractical). The first flying objects were sighted in the Spring of 1947, after a total 5 atomic bomb explosions, i.e., Alamogordo, Hiroshima, Nagasaki, Crossroads A and Crossroads B. Of these, the first two were in positions to be seen from Mars, the third was very doubtful (at the edge of Earth's disc in daylight) and the last two were on the wrong side of Earth. It is likely that Martian astronomers, with their thin atmosphere, could build telescopes big enough to see A-bomb explosions on Earth, even though we were 165 and 153 million miles away, respectively, on the Alamogordo and Hiroshima dates. The weakest point in the hypothesis is that a continual, defensive watch of Earth for long periods of time (perhaps thousands of years) would be dull sport, and no race that even remotely resembled Man would undertake it. We haven't even considered the idea for Venus or Mars, for example.

The sum and substance of this discussion is that if Martians are now visiting us without contact, it can be assumed that they have just recently succeeded in space travel and that their civilization would be practically abreast of ours.

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The chance that Martians, under such widely divergent conditions, would have a civilization resembling our own is extremely remote. It is particularly unlikely that their civilization would be within a half century of our own state of advancement. Yet in the last 50 years we have just started to use aircraft and in the next 50 years we will almost certainly start exploring space.

Thus it appears that space travel from another point within the Solar system is possible but very unlikely. Odds are at least a thousand-to-one against it.

This leaves the totality of planets of other stars in the Galaxy as possible sources. Many modern astronomers believe that planets are fairly normal and logical affairs in the life history of a star (rather than cataclysmic oddities) so that many planets can be expected to exist in space.

To narrow the field a little, some loose specifications can be written for the star about which the home base planet would revolve. Let us say that the star should bear a family resemblance to the Sun, which is a member of the so-called "main-sequence" of stars, i.e., we eliminate white dwarfs, red giants and supergiants. For a description of these types, see reference 2, chapter 5. There is no specific reason for making this assumption except to simplify discussion: we are still considering the majority of stars.

Next, true variable stars can be eliminated, since conditions on a planet attached to a variable star would fluctuate too wildly to permit life. The number of stars deleted here is negligibly small. Reference 3, pages 76 and 85 indicate that the most common types are too bright to be in nearby space unnoticed. Lastly, we shall omit binary or multiple stars, since the conditions for stable planet orbits are obscure in such cases. About a third of the stars are eliminated by this restriction.

As our best known sample of space we can take a volume with the Sun at the center and a radius of 16 light years. A compilation of the 47 known stars, including the Sun, within this volume is given in reference 4, pages 52 to 57. Eliminating according to the above discussion: Three are white dwarfs, eight binaries account for 16 stars and two trinaries account for 6 more. The remainder, 22 stars, can be considered as eligible for habitable planets.

Assuming the above volume to be typical, the contents of any other reasonable volume can be found by varying the number of stars proportionately with the volume, or with the radius cubed, $S_e = 22 \times (\frac{r}{16})^3$, where S_e is number of eligible stars and r is the radius of the volume in light years. (This formula should only be used for radii greater than 16 light years. For smaller samples we call for a recount. For example, only one known eligible star other than the Sun lies within eight light years).

Having an estimate of the number of useable stars, it is now necessary to make a guess as to the number of habitable planets. We have only one observed sample, the Solar System, and the guess must be made with low confidence, since intelligent life may not be randomly distributed at all.

The Sun has nine planets, arranged in a fairly regular progression of orbits (see reference 1, Appendix I) that lends credence to theories that many stars have planets. Of the nine planets, (one, the Earth) is completely suitable for life. Two more (in adjacent orbits) are near misses: Mars has extremely rigorous living conditions and Venus has an unsuitable atmosphere. Viewed very broadly indeed, this could mean that each star would have a series of planets so spaced that one, or possibly two, would have correct temperatures, correct moisture content and atmosphere to support civilized life. Let us assume that there is, on the average, one habitable planet per eligible star.

There is no line of reasoning or evidence which can indicate whether life will actually develop on a planet where the conditions are suitable. Here again, the Earth may be unique rather than a random sample. This writer can only inject some personal intuition into the discussion with the view that life is not unique on Earth, or even the random result of a low probability, but is practically inevitable in the right conditions. This is to say, the number of inhabited planets is equal to those that are suitable!

One more item needs to be considered. Knowing nothing at all about other races, we must assume that Man is average as to technical advancement, environmental difficulties, etc. That is, one half of the other planets are behind us and have no space travel and the other half are ahead and have various levels of space travel. We can thus imagine that in our sample volume there are 11 races of beings who have begun space explorations. The formula on page 3 above now becomes

$$R = 11 \times (\frac{r}{16})^3$$

where R is the number of races exploring space in a spherical volume of radius $r \geq 16$ light years.

Arguments like those applied to Martians on page 2 need not apply to races from other star systems. Instead of being a first port of call, Earth would possibly be reached only after many centuries of development and exploration with space ships, so that a visiting race would be expected to be far in advance of Man.

To summarize the discussion thus far: the chance of space travelers existing at planets attached to neighboring stars is very much greater than the chance of space-traveling Martians. The one can be viewed almost as a certainty (if the assumptions are accepted), whereas the other is very slight indeed.

In order to estimate the relative chances that visitors from Mars or star X could come to the Earth and act like "flying objects", some discussion of characteristics of space ships is necessary.

To handle the simple case first, a trip from Mars to Earth should be feasible using a rocket-powered vehicle. Once here, the rocket would probably use more fuel in slowing down for a landing than it did in initial takeoff, due to Earth's higher gravitational force.

A rough estimate of one-way performance can be found by adding the so-called "escape velocity" of Mars to that of the Earth plus the total energy change (kinetic and potential) used in changing from one planetary orbit to the other. These are 3.1, 7.0, and 10.7 miles per second, respectively, giving a total required performance of 20.8 miles per second for a one-way flight. Barring a suicide mission, the vehicle would have to land and replenish or else carry a 100% reserve for the trip home.

Let us assume the Martians have developed a nuclear, hydrogen-propelled vehicle (the most efficient basic arrangement that has been conceived here on Earth) which uses half its stages to get here and the remaining stages to return to Mars, thus completing a round trip without refueling, but slowing down enough in our atmosphere to be easily visible (i.e., practically making a landing). Since it is nuclear powered, gas temperatures will be limited to the maximum operating temperatures that materials can withstand (heat must transfer from the pile to the gas, so cooling can't be used in the pile). The highest melting point compound of uranium which we can find is uranium carbide. It has a melting point of 4560°R. Assume the Martians are capable of realizing a gas temperature of 4500°R (= 2500°K), and that they also have alloys which make high motor pressures (3000 psi) economical. Then the specific impulse will be I = 1035 seconds and the exhaust velocity will be c = 33,400 ft/sec (reference 5). Calculation shows that using a single stage for each leg of the journey would require a fuel/gross weight ratio of 0.96 (for each stage) too high to be practical. Using two stages each way (four altogether) brings the required fuel ratio down to 0.81, a value that can be realized.

If, by the development of strong alloys, the basic weight could be kept to 10% of the total weight for each stage, a residue of 9% could be used for payload. A four stage vehicle would then have a gross weight $\frac{(100)^4}{9}$ = 15,000 times as great as the payload: thus, if the payload were 2,000 pounds, the gross weight would be 30 million pounds at initial takeoff (Earth pounds).

Of course, if we allow the Martians to refuel, the vehicle could have only two stages* and the gross weight would be only $(\frac{100}{9})^2$ = 123 times the payload, i.e., 250,000 pounds. This would require bringing electrolytic and refrigerating equipment and sitting at the South Pole long enough to extract fuel for the hourney home, since they have not asked us for supplies. Our oceans (electrolysis to make H_2) would be obvious to Martian telescopes and they might conceivably follow such a plan, particularly if they came here without foreknowledge that Earth has a civilization.

Requirements for a trip from a planet attached to some star other than the Sun can be calculated in a similar manner. Here the energy (or velocity) required has more parts: (a) escape from the planet (b) escape from the star (c) enough velocity to traverse a few light years of space in reasonable time (d) deceleration toward the Sun (e) deceleration toward the Earth. The nearest "eligible" star is an object called Wolf 359 (see reference 4, p 52), at a distance of 8.0 light years. It is small, having an absolute magnitude of 16.6 and is typical of "red dwarfs" which make up more than half of the eligible populations. By comparison with similar stars of known mass, this star is estimated to have a mass roughly 0.03 as great as the sun. Since the star has a low lumihosity (being much cooler and smaller than the Sun) a habitable planet would need to be in a small orbit for warmth.

Of the changes of energy required as listed in the preceding paragraph, item (c), velocity to traverse intervening space, is so large as to make the others completely negligible. If the visitors were long lived and could "hibernate" for 80 years both coming and going, then 1/10 the speed of light would be required, i.e., the enormous velocity of 18,000 miles per second. This is completely beyond the reach of any predicted level of rocket propulsion.

If a race were far enough advanced to make really efficient use of nuclear energy, then a large part of the mass of the nuclear material might be converted into jet energy. We have no idea how to do this, in fact reference 6 indicates that the materials required to withstand the temperatures, etc., may be fundamentally unattainable. Let us start from a jet-propellant-to-gross-weight ratio of 0.75. If the total amount of expended material (nuclear plus propellent) can be 0.85 of the gross weight, then the nuclear material expended can be 0.10 of the gross. Using an efficiency of 0.5 for converting nuclear energy to jet energy and neglecting relativistic mass corrections, then a rocket velocity of half the velocity of light could be attained. This would mean a transit time of 16 years each way from the star Wolf 359, or longer times from other eligible stars. To try to go much faster would mean spending much energy on relativistic changes in mass and therefore operating at lowered efficiency.

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* Actually three stages. On the trip to Earth, the first stage would be filled with fuel, the second stage would contain partial fuel, the third would be empty. The first stage would be thrown away during flight. On the trip back to Mars, the second and third stages would be filled with fuel. The gross weight of the initial vehicle would be of the order of magnitude of a two-stage rocket.

To summarize this section of the discussion, it can be said that a trip from Mars is a logical engineering advance over our own present technical status, but that a trip from another star system requires improvements of propulsion that we have not yet conceived.

Combining the efforts of all the science-fiction writers, we could conjure up a large number of hypothetical methods of transportation like gravity shields, space overdrives, teleports, simulators, energy beams and so on. Conceivably, among the myriads of stellar systems in the Galaxy, one or more races have discovered methods of travel that would be fantastic by our standards. Yet the larger the volume of space that must be included in order to strengthen this possibility, the lower will be the chance that the race involved would ever find the earth. The Galaxy has a diameter of roughly 100,000 light years and a total mass about two hundred billion times that of the Sun (reference 4). Other galaxies have been photographed and estimated in numbers of several hundred million (reference 2, p. 4) at distances up to billions of light years (reference 7, p. 158). The number of stars in the known universe is enormous, yet so are the distances involved. A super-race (unless they occur frequently) would not be likely to stumble upon Planet III of Sol, a fifth-magnitude star in the rarefied outskirts of the Galaxy.

A description of the probable operating characteristics of space ships must be based on the assumption that they will be rockets, since this is the only form of propulsion that we know will function in outer space. Below are listed a few of the significant factors of rocketry in relation to the "flying objects".

(a) Maneuverability. A special-purpose rocket can be made as maneuverable as we like, with very high accelerations either along or normal to the flight path. However, a high-performance space ship will certainly be large and unwieldy and could hardly be designed to maneuver frivolously around in the Earth's atmosphere. The only economical maneuver would be to come down and go up more or less vertically.

(b) Fuel reserves. It is hard to see how a single rocket ship could carry enough extra fuel to make repeated descents into the Earth's atmosphere. The large number of flying objects reported in quick succession could only mean a large number of visiting craft.

Two possibilities thus are presented. First, a number of space ships could have come as a group. This would only be done if full-dress contact were to be established. Second, numerous small craft might descend from a mother ship which coasts around the Earth in a satellite orbit. But this could mean that the smaller craft would have to be rockets of satellite performance, and to contain them the mother ship would have to be truly enormous.

(c) Appearance. A vertically descending rocket might well appear as a luminous disk to a person directly below. Observers at a distance, however, would surely identify the rocket for what it really is. There would probably be more reports of oblique views than of end-on views. Of course, the shape need not be typical of our rockets; yet the exhaust should be easy to see.

One or two additional general remarks may be relevant to space ships as "flying objects". The distribution of flying objects is peculiar, to say the least. As far as this writer knows, all incidents have occurred within the United States, whereas visiting spacemen could be expected to scatter their visits more or less uniformly over the globe. The small area covered indicates strongly that the flying objects are of Earthly origin, whether physical or psychological.

The lack of purpose apparent in the various episodes is also puzzling. Only one motive can be assigned; that the space-men are "feeling out" our defenses without wanting to be belligerent. If so, they must have been satisfied long ago that we can't catch them. It seems fruitless for them to keep repeating the same experiment.

Conclusions:

Although visits from outer space are believed to be possible, they are believed to be very improbable. In particular, the actions attributed to the "flying objects" reported during 1947 and 1948 seem inconsistent with the requirements for space travel.

Very truly yours,

J. E. Lipp
Missiles Division

JEL:sp -

References

1. "Earth, Moon and Planets", by F.L.Whipple, Harvard Books on Astronomy, Blakiston, 1941.
2. "Atoms, Stars and Nebulae", by Goldberg, Alter; Harvard Books on Astronomy, Blakiston, 1943.
3. "The Story of Variable Stars", by Campbell and Jacchia, Harvard Books on Astronomy, Blakiston, 1945.
4. "The Milky Way", by Bok and Bok, Harvard Books on Astronomy, Blakiston 1941.
5. Calculated Properties of Hydrogen Propellant at High Temperatures. Data provided to RAND by Dr. Altman, then at JPL. Unpublished.
6. "The Use of Atomic Power for Rockets", by R. Serber, Appendix IV Second Quarterly Report, RA-15004, Douglas Aircraft Co., Inc., Project Rand.
7. "Galaxies", by Shapley, Harlow; Harvard Books on Astronomy, Blakiston 1943.

[redacted]

S-11750

UNCLASSIFIED

SECRET

AFOIR-3C/Lt Col Garrett/AT/4644
6 Oct 47

(1)

Basic: Ltr fr Hq, AMC, Wright Fld, Dayton, O. 24 Sept 47, Subj: "Flying Saucers"

RMT: Cys of Inclosures in A-2 Files

Acc

AFOIR-3C-3 1st Ind

Department of the Air Force, Hq, USAF, Washington 25, D. C.

TO: Commanding General, Air Materiel Command, Wright Field, Dayton, Ohio
ATTN: MCNAD-2B

Attached hereto is information requested in basic letter.

BY ORDER OF THE SECRETARY OF THE AIR FORCE:

1 Incls:

UNCLASSIFIED SECRET

OFFICE SYMBOL	1. [illegible]	3.	4. AFOIR-3C	5.
GRADE AND SURNAME OF COORDINATING OFFICERS	Memo for Chief, Air Intel Div, 3 Oct 47		Col Taylor	
	Summary of Info on Unidentified Flying Objects		Lt Col Garrett	

DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS. DOD DIR 5200.10

UNCLASSIFIED

COPY

~~SECRET~~

TSNAD-2B/ACL:eec

24 September 1947

TSNAD-2B

SUBJECT: "Flying Disc"

TO: Commanding General
Army Air Forces
Washington 25, D. C.

ATTN: AC/AS-2
Major General George McDonald

1. In compliance with General McDonald's telephone conversation, this date, to Colonel H. K. McCoy, T-2, Hq. AMC, attached herewith is a copy of a drawing entitled, "Loedding Flying Disc", designated LD-2. Because of patent rights involved, it is requested that a record be kept of all persons reviewing this drawing by witnessing with signatures and dates directly on the drawing.

2. This drawing should be returned to this office when it has served its purpose so that it can be turned over to the Patent Office Hq. AMC for official record.

X4529.1 Airplanes - Misc

3. Inclosed herewith is also a report prepared by the Royal Aircraft Establishment, Technical Note, AERO 1703, which describes the Horten tailless aircraft. The following references are invited which is considered significant in relating the Horten brothers perspective thinking and accomplishments toward the alleged "Flying Saucer" case:

a. Page 5, Paragraph 4 and 6.

b. Page 6, Paragraph 1 and 7.

c. Page 26, Paragraph 3 and 10.

d. Page 27, Paragraph 12.

e. Page 28, Paragraphs 1 through 5.

f. Page 54, Photograph of Horten "Parabola".

att'd

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COPY

U-39942

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

KD 93.6012
491/04/00 1003249

Basic ltr, dtd 24 Sep 47, to CG, Hq AAF, Wash, subj: "Flying Disc"

c. Page 69, The Horten VIII.

d. Pages 71 and 72, Photographs of the Horten IX Versions.

i. Page 74, Drawing of the "Parabola".

This document should also be returned when it has served its intended purpose.

X 452.1 Airplanes - Russia

4. A recent report from the U. S. Military attache, Moscow, USSR, dated 9 June 1947, indicates that 1500 aircraft, directly or indirectly based on the Horten VIII design (six engine pusher, having a wing spread of 131 feet and a gross weight of approximately thirty-three thousand pounds) are being built for bomber squadron use. The Russian version, however, is jet propelled, reference report whose identification No. is V-32291-S.

X095

5. The T-2 report "German Flying Wings Designed by Horten Brothers", No. F-SU-1110-MI, also inclosed herewith, may be retained by your office if desired.

FOR THE COMMANDING GENERAL:

H. M. McCOY
Colonel, Air Corps
Deputy Commanding General
Intelligence (T-2)

3 Incls:
1. Drawing
2. RAE Tech Note, AERO 1703
3. T-2 Rpt, No. F-SU-1110-ND

DOWNGRADED AT 3 YEAR INTERVALS:
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

HqAMC Form No. 10-316 (Rev 10 Sep 46)

UNCLASSIFIED

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HEADQUARTERS
AIR MATERIEL COMMAND

IN REPLY ADDRESS BOTH COMMUNICATION AND ENVELOPE TO COMMANDING GENERAL, AIR MATERIEL COMMAND, ATTENTION FOLLOWING OFFICE SYMBOL:

TSDIN

TSDIN/HE:/1e/6-4109
WRIGHT FIELD, DAYTON, OHIO

SUBJECT: Flying Discs

TO: Chief of Staff
United States Air Force
Washington 25, D. C.
ATTENTION: Director, Research & Development
Major General L. C. Craigie

1. Confirming the recent conversation of the undersigned with Major General L. C. Craigie, 9 December 1947, attached as listed below are copies of the reports from this Headquarters concerning Flying Discs.

2. Comments of Headquarters, Air Force on these letters have never been received by this Command. Continued and recent reports from qualified observers concerning this phenomenon still makes this matter one of concern to Headquarters, Air Materiel Command. Intelligence Department of this Command is continuing the collection and analysis of all available reports.

FOR THE COMMANDING GENERAL:

H. M. McCOY
Colonel, USAF
Chief of Intelligence

2 Attach:
cc ltr to CG, AAF, dtd 23 Sept 47
subj "AMC Opinion Concerning "Flying Discs""
cc ltr to CG, AAF, dtd 24 Sept 47
subj "Flying Discs"

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

SECRET

3

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U-53791

UNCLASSIFIED

SECRET

COPY

HEADQUARTERS
AIR MATERIEL COMMAND

TSNAD-2B/ACI/amc
Wright Fld, Dayton, O.
24 Sept 47

TSNAD-2B

"Flying Saucers"

Commanding General, Army Air Force, Washington 25, D.C.
ATTN: AC/AS-2, Lt Col Garrett

X 007.9-Japan

It is requested that this office be furnished all available information concerning an alleged "Flying Saucer" flight sighting made by a radar station in Japan. This incident was mentioned by Dr. Charles Carroll during a conference in Brig Gen Schulgen's office attended by Mr. A.C. Loedding, T-2 representative, on 5 September 1947.

FOR THE COMMANDING GENERAL:

/s/ M.E.Gell
/t/ H.M.McCOY
Colonel, Air Corps
Deputy Commanding General
Intelligence T-2

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

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HEADQUARTERS
AIR MATERIEL COMMAND

IN REPLY ADDRESS ENVELOPE AND COMMUNICATION AND ENVELOPE TO ATTENTION OF FOLLOWING OFFICE SYMBOL:
TSNAD-2B

18 Nov 47
TSNAD-2B/ACL/smt

WRIGHT FIELD, DAYTON, OHIO

SUBJECT: Flying Discs.

TO: Chief of Staff
United States Air Force
Washington 25, D. C.
ATTENTION: Office, Director of Intelligence
Lt Colonel George Garrett, Jr.

1. The inclosed newspaper clippings are submitted for your information and comment. The incident reported in Seattle appeared in the "Dayton Journal" on 12 November 1947, and should be followed up if possible.

2. The story by Lionel Shapiro regarding war weapons developed in Spain evidently was printed in a number of leading newspapers throughout the country. The significance of this article will be dependent upon certain essential elements for such alleged important developments, such as funds, materials, experimental testing facilities, and technological "know-how". The latter is supposed to be supplied by German scientists. The German scientists at this Hq indicate that no important scientists from Germany are working in Spain, and those mentioned in this article are not known to them.

3. If possible, therefore, an effort should be made to obtain names, qualifications, or any information that might help to identify the alleged German scientists working in Spain.

4. A brief statement was made in a recent intelligence report from [redacted], AC/AS-2, regarding a flying disc incident in Alaska in September. The close range sighting reported should render a more detailed observation upon that was reported, which also suggests a follow-up.

5. It is further requested that this office be advised as to progress being made on the plotting of all flying disc incidents to date, particularly in North America. It was understood that Mr. Carroll was going to [redacted] those incidents, but no further word was received regarding this effort.

FOR THE COMMANDING GENERAL:

1 Incl
newspaper clippings

H. M. McCOY
Colonel, Air Corps
Director of Intelligence

SECRET

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DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

~~CONFIDENTIAL~~

UNCLASSIFIED Lt. Col Graalman/AG 74364

Ltr frm Hq AFTRC, dated 16 September 1947, Subject: "Interview of Witness" (Brigadier General Russell E. Randall, 01-0831)

AFTAI (3D) 1st Ind.

Hq AAF, Washington 25, DC, 23 September 1947

To: Commanding General, Air Training Command, Barksdale Field, Shreveport, Louisiana.

Transmitted herewith in compliance with basic communication is testimony of Brigadier General Russell E. Randall (in quadruplicate).

BY COMMAND OF GENERAL SPAATZ:

X201-0

A. H. GILKESON,
Brig. Gen., U. S. A.,
Deputy, The Air Inspector.

2 Incls.
1. Ltr.
2. (added) Testimony of Gen. Randall (in quad.)

DOD. 71 Interviews

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

UNCLASSIFIED ~~CONFIDENTIAL~~

OFFICE SYMBOL	1. AFTAI	2.	3.	4.	5.
GRADE AND SURNAME OF COORDINATING OFFICERS		2			

16-26242-3 U. S. GOVERNMENT PRINTING OFFICE

~~CONFIDENTIAL~~

UNCLASSIFIED

AFDIR-CO

11 Sept 47

SUBJECT: Reported Sightings of Flying Discs.

TO : Commanding General
Air Materiel Command
Wright Field, Dayton, Ohio
Attention: T-2.

1. As arranged verbally with Mr. Loedding, inclosed is the complete file maintained by this Office on reported sightings of Flying Discs.

2. This file is forwarded so that photostats may be made in order to provide your Command with a duplicate set of these sightings.

3. When photostating this material for your purpose, it will be appreciated if one extra set is made for this Office and returned at the same time the originals are returned.

4. This file, and the duplicates, should be returned as soon as possible to this Headquarters, Attention: AC/AS-2, Air Intelligence Requirements Division, Collection Branch.

BY COMMAND OF GENERAL SPAATZ:

Incl
s/s in
par. 1.

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

UNCLASSIFIED ~~CONFIDENTIAL~~

OFFICE SYMBOL	1.	2.	3.	4.	5.
GRADE AND SURNAME OF COORDINATING OFFICERS	Col. Taylor				

10-75042-2 U. S. GOVERNMENT PRINTING OFFICE

UNCLASSIFIED

[redacted]

1. As requested by AC/AS-2 there is presented below the considered opinion of this Command concerning the so-called "Flying Discs". This opinion is based on interrogation report data furnished by AC/AS-2 and preliminary studies by personnel of T-2 and Aircraft Laboratory, Engineering Division T-3. This opinion was arrived at in a conference between personnel from the Air Institute of Technology, Intelligence T-2, Office, Chief of Engineering Division, and the Aircraft, Power Plant and Propeller Laboratories of Engineering Division T-3.

2. It is the opinion that:

a. The phenomenon reported is something real and not visionary or fictitious.

b. There are objects probably approximating the shape of a disc, of such appreciable size as to appear to be as large as man-made aircraft.

c. There is a possibility that some of the incidents may be caused by natural phenomena, such as meteors.

d. The reported operating characteristics such as extreme rates of climb, maneuverability (particularly in roll), and action which must be considered evasive when sighted or contacted by friendly aircraft and radar, lend belief to the possibility that some of the objects are controlled either manually, automatically or remotely.

e. The apparent general description of the objects is as follows:-

(1) Metallic or light reflecting surface.

U-39552

& priority, security classification and Code Name for a detailed study of
this matter to include the preparation of complete sets of all available
and pertinent data which will then be made available to the Army, Navy,
Atomic Energy Commission, JRDB, the Air Force Scientific Advisory Group,
NACA, and the RAND and MEPA projects for comments and recommendations
with a preliminary report to be forwarded within 15 days of receipt
the data and a detailed report thereafter every 30 days as the inve

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[redacted]

JTGM 2

[redacted]

4. It is suggested that the activities of this project [redacted] the preparation and distribution of an initial report, [redacted] in Enclosure 1, and that subsequent reports be issued on [redacted] basis. Supplementary reports should be issued as more [redacted] vals should the need for same be indicated. This [redacted] priority 2A, with a security classification of [redacted] Name of Project. Where data of a classification [redacted] is handled by the project such data should be classified [redacted] A complete interchange of data should be effected as recommended in Enclosure 1.

BY COMMAND OF THE CHIEF OF STAFF:

L. C. CRAIGIE
Major General, U. S. Air Force
Director of Research and Development
Office, Deputy Chief of Staff, Material

2 Encls
1. Memo dtd 23 Sept '47 from AMC to AC/AS-2 (Gen Schulgen)
2. Memo dtd 24 Sept '47 from AMC to AC/AS-2 (Gen McDonald)
3. Memo dtd 19 Dec '47 to Gen Craigie
4. R&R from [redacted]/2 Encls

OFFICE SYMBOL				
GRADE AND SURNAME OF COORDINATING OFFICERS	AFRDC	AFCIN	AFDSP	AFOPO

UNCLASSIFIED

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[redacted]

[redacted]

31 Oct 47

AC/E

[redacted]

[redacted]

Department of the Air Force, Hq USAF, [redacted]

TO: Commanding General, Air Material Command, Wright Field, Dayton, Ohio
ATTN: TSEAD-2B

Attached hereto is information requested in basic letter.

BY ORDER OF THE SECRETARY OF THE AIR FORCE:

[redacted]

3 Incls:

OFFICE SYMBOL	1. [redacted]	2.	4. AFBIB-OO	5.
GRADE AND 3 SURNAME OF COORDINATING OFFICER	Memo for Chief, Air Intel Div, 2 Oct 47		Col Taylor	

1. As arranged verbally with Mr. Loedding, inclosed is the complete file maintained by this Office on reported sightings of Flying Discs.

2. This file is forwarded so that photostats may be made in order to provide your Command with a duplicate set of these sightings.

3. When photostating this material for your purpose, it will be appreciated if one extra set is made for this Office and returned at the same time the originals are returned.

4. This file, and the duplicates, should be returned as soon as possible to this Headquarters, Attention: AC/AS-2, Air Intelligence Requirements Division, Collection Branch.

BY COMMAND OF GENERAL SPAATZ:

Encl
a/s in
par. 1.

ACQ

W Cork

CONFIDENTIAL

OFFICE SYMBOL	AFRIR-CL				
GRADE AND SIGNATURE	Col. Taylor 3rd				

UNCLASSIFIED

witnessing with signatures and dates directly on the drawing.

2. This drawing should be returned to this office when it has served its purpose so that it can be [illegible] Office Eq. AMC for [illegible].

3. [illegible] is also a report [illegible] Aircraft Materials Command, Technical Note, [illegible] the Horten [illegible] which is considered significant in relation to the Horten brothers' [illegible] operative thinking and accomplishments toward the alleged "flying saucer" case:

a. Page 5, Paragraph 4 and 6.

b. Page 6, Paragraph 1 and 7.

c. Page 26, Paragraph 3 and 10.

d. Page 27, Paragraph 12.

e. Page 28, Paragraphs 1 through 5.

f. Page 54, Photograph of Horten "Parabola".

att #2

2

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U-39962

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COPY

Number Two, dtd 24 Sep 47, to CG, Hq AAF, Wash, subj: "Flying Wings"

c. Page 69, The Horten VIII.

h. Pages 71 and 72, Photographs of the Horten IX Versions.

i. Page 74, Drawing of the "Parabola".

This document should also be returned when it has served its intended purpose.

4. A recent report from the U. S. Military Attaché, Moscow, USSR, dated 9 June 1947, indicates that 1500 aircraft, directly or indirectly based on the Horten VIII design (six engine pusher, having a wing spread of 131 feet and a gross weight of approximately thirty-three thousand pounds) are being built for bomber squadron use. The Russian version, however, is jet propelled, reference report whose identification No. is V-32291-G.

X4582.1

5. The T-2 report "German Flying Wings Designed by Horten Brothers", No. F-SU-1110-MD, also inclosed herewith, may be obtained by your office if desired.

X095

FOR THE COMMANDING GENERAL:

H. M. McCOY
Colonel, Air Corps
Deputy Commanding General
Intelligence (T-2)

3 Incls:
1. Drawing
2. RAE Tech Note, AERO 1793
3. T-2 Rpt, No. F-SU-1110-MD

SECRET



drek 3

UNCLASSIFIED

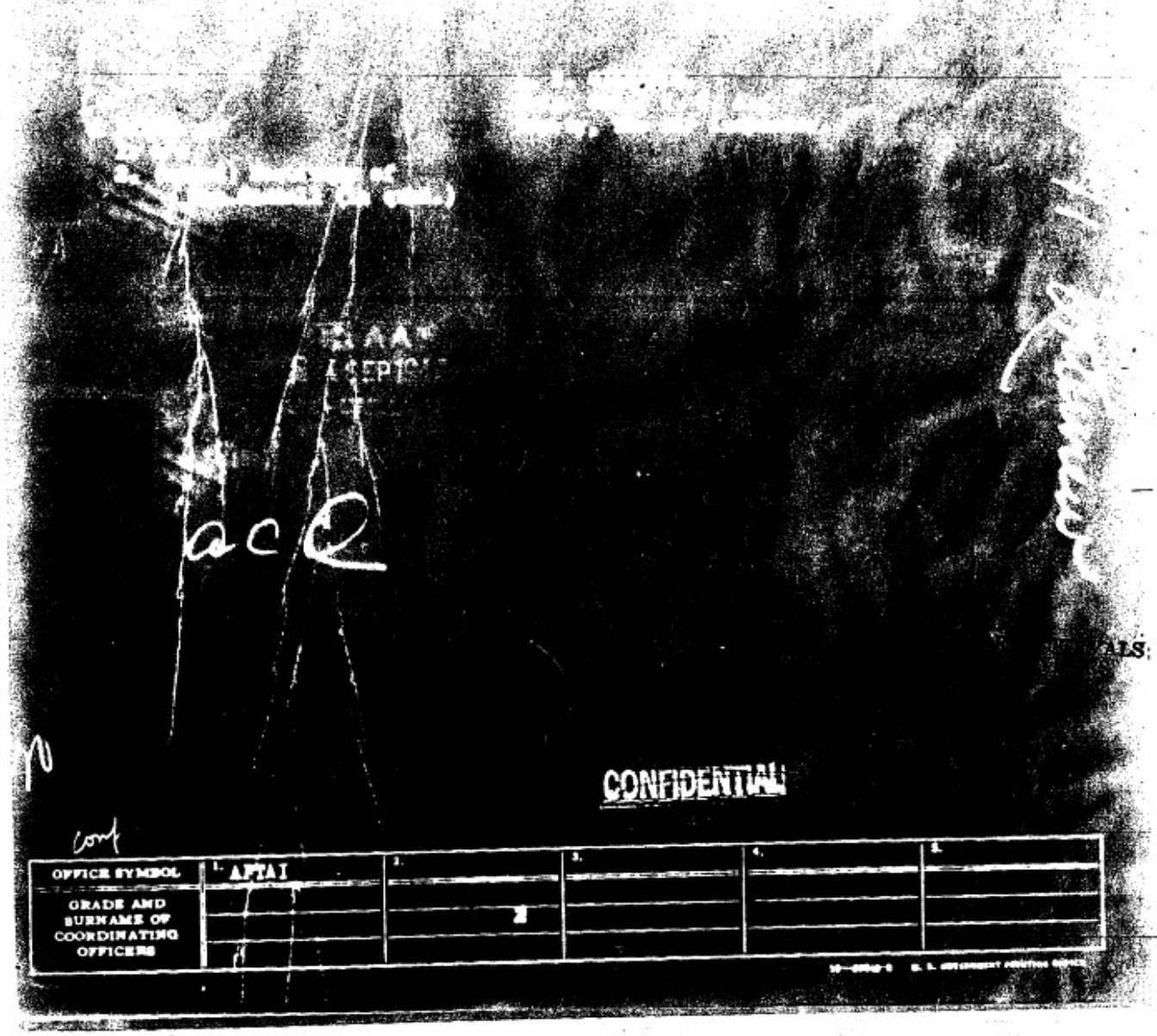
It is requested that this office [illegible]
information concerning an object "[illegible]
made by a radar station in [illegible]
Mr. Charles Carroll during a conference [illegible]
officer attended by Mr. A.M. Landing, [illegible]
September 1947.

FOR THE COMMANDING GENERAL:

/s/ W.M.Gail
W.M.McCOY
Colonel, Air Corps
Deputy Commanding General
Intelligence T-2

SECRET

UNCLASSIFIED



[redacted]

[redacted] piloted aircraft which has the performance characteristics as outlined in paragraph (c) above which would be capable of operation for a radius of 7000 miles at subsonic speeds.

[redacted] would be extremely expensive, time consuming and would seriously impair the progress of current projects and therefore, if practicable, should be undertaken independently of existing projects.

b. Due consideration must be given the following:-

(1) The possibility that these objects are of domestic origin - the product of some high security project not known to AC/AS-2 or this Command.

(2) The lack of physical evidence in this type of case. No recovered exhibits which would undoubtedly prove the existence of these objects.

(3) The possibility that some foreign nation has a form of propulsion possibly nuclear, which is outside of our domestic knowledge.

3. It is recommended that:-

a. Headquarters, Army Air Forces issue a directive assigning a priority, security classification and Code Name for a detailed study of this matter to include the preparation of complete sets of all available and pertinent data which will then be made available to the Army, Navy, Atomic Energy Commission, JRDB, the Air Force Scientific Advisory Group, NACA, and the RAND and NEPA projects for comments and recommendations, with a preliminary report to be forwarded within 15 days of receipt of the data and a detailed report thereafter every 30 days as the investi-



CONFIDENTIAL

HEADQUARTERS
AIR MATERIEL COMMAND

[illegible]

24 NOV 1947

SUBJECT: Flying Discs

TO: Chief of Staff
United States Air Force
Washington 25, D. C.
ATTENTION: Office, Director of Intelligence
Lt Colonel George Garrett, Jr.

Reference letter, subject as above, dated 18 November 1947, it is requested that immediate action be taken to appropriately mark or stamp this correspondence with the classification "secret". This classification number is as follows: U-48965

FOR THE COMMANDING GENERAL:

H. M. McCOY
Colonel, USAF
Chief of Intelligence

To DF files
action completed
Lt Col Garrett - OIR-CO
12-10-47

CONFIDENTIAL

CONFIDENTIAL

Spain evidently was printed in a number of leading newspapers throughout the country. The significance of this article will be dependent upon certain essential elements for such alleged important developments, such as funds, materials, experimental testing facilities, and technological "know-how". The latter is supposed to be supplied by German scientists. The German scientists at this Hq indicate that no important scientists from Germany are working in Spain, and those mentioned in this article are not known to them.

3. If possible, therefore, an effort should be made to obtain names, qualifications, or any information that might help to identify the alleged German scientists working in Spain.

4. A brief statement was made in a recent intelligence report from Hq, USAF, AC/AS-2, regarding a flying disc incident in Alaska [illegible]. The close range sighting reported should render a more detailed [illegible] than what was reported, which also suggests a follow-up.

5. It is further requested that this office be advised as to progress being made on the plotting of all flying disc incidents to date, particularly in North America. It was understood that Dr. Carwell was going to plot these incidents, but no further word was received regarding this effort.

FOR THE COMMANDING GENERAL:

Full
C D GARRETT
Lt Col USAF

H. M. McCOY
Colonel, Air Corps
Director of Intelligence

1 Incl
newspaper clippings

[illegible]

[redacted]

on 14 Nov 57 I called Miss Snoddy, who is Chief, Administrative Reference Branch, Mail and Records Management Division, Air Adj Gen Office, Hq USAF (extension 74835). AFCAG-22.

Miss Snoddy is trying to locate letter from C/S, USAF, dated 30 Dec 44, subject: "Flying Discs".

HEADQUARTERS
AIR MATERIEL COMMAND
Wright-Patterson Air Force Base
Dayton, Ohio

MCIAXO-3/1958/ra
Jan 5 1949

MCIAXO

SUBJECT: Project "SIGN"

TO: Chief, Air Weather Service,
Andrews Air Force Base,
Washington 25, D. C.
ATTN: DSS

1. Project "SIGN" is responsible for the collection, investigation and interpretation of data relative to sighting of unidentified flying objects. Attached Incident Summaries 1 thru 172 from the files of Project "SIGN" are forwarded for study and recommendations as to which of the incidents may be eliminated as balloons released on routine synoptic ascents by the Air Weather Service, the Navy Aerological Service or the United States Weather Bureau. The summaries attached may be retained in your headquarters for working and reference purposes.

2. The Air Weather Service is the only agency of its type that has been asked to assist in the accomplishment of Project "SIGN" except that the United States Weather Bureau has provided information on ball lightning. Research projects in which balloons are used and which are conducted or sponsored by the Army, Navy or United States Air Force are checked by the Intelligence Department of this Command. These checks are usually made direct from the Project "SIGN" Office, MCIAXO-3. These checks are distinct from the check of synoptic balloon flights made by weather service stations of the Air Force, the Navy and the Department of Commerce. (U. S. Weather Bureau) requested of Air Weather Service.

3. It is the opinion of this office that the below listed incidents are those having the greatest possibility of being balloons. This list does not eliminate the possibility that many of the remaining incidents are balloons.

2	24	50	91	113	155
3	25	52	92	115	156
4	26	72	96	126	157
11	30	73	104	141	159
14	31	81	105	148	163
16	32	87	107,8,9	151	167
22	33	89	112(See122)	154	169
23	48				

T-82481-A

Hq AMC, Chief, Air Weather Service, Washington 25, D. C.
Subj: Project "SIGN"

4. The form used in interrogating witnesses to sightings is inclosed as a matter of interest. Comment as to possible improvement of the "Essential Elements of Information" in regard to routine synoptic balloon flights is invited.

5. It is requested that correspondence be forwarded to the Commanding General, Headquarters, Air Materiel Command, attention MCIAXO-3.

FOR THE COMMANDING GENERAL:

/s/ W. R. Clingerman, Col, USAF
for H. M. McCOY
Colonel, USAF
Chief, Intelligence Dept

2 Incls:
Summaries 1-172 incl
"EEI"

Copies furnished:

AFOIR, Hq. USAF
Capt Trakowski, Geophysics Lab
Major Kodis, MCREER
Colonel Neal, MCLAWS

T-SIGN-51-A

Dr. HYNEK'S EVALUATIONS EXTRACTED FROM PROJECT GRUDGE REPORT.

INCIDENT INDEX

1. Astronomical

   a. High probability:
   #26, 27, 30, 31, 32, 33, 34, 48, 49, 59, 60, 66, 69, 70, 94, 95, 96, 97, 98, 101, 102, 103, 104, 116, 119, 132, 136, 140, 147, 148, 158, 174, 184, 185, 187, 197, 203, 204, 208, 216, 219, 238.

   b. Fair or low probability:
   #19, 20, 23, 24, 28, 35, 36, 46, 50, 63, 67, 80, 82, 93, 100, 112, 120, 121, 129, 130, 144, 153, 165, 166, 167, 175, 192, 199, 202, 205, 220, 230, 240.

2. Non-astronomical but suggestive of other explanations

   a. Balloons or ordinary aircraft:
   #3, 11, 22, 41, 42, 53, 54, 73, 81, 83, 91, 92, 113, 114, 115, 126, 131, 138, 141, 145, 155, 156, 157, 159, 160, 161, 163, 169, 171, 173, 178, 180, 182, 188, 190, 194, 195, 196, 198, 200, 201, 209, 210, 217, 222, 235, 237, 239.

   b. Rockets, flares or falling bodies:
   #4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 25, 56, 65, 78, 106, 107, 108, 109, 133, 170, 211, 218.

   c. Miscellaneous (reflections, auroral streamers, birds, etc.):
   #39, 89, 123, 124, 128, 146, 164, 181, 189, 214, 223, 231, 234.

3. Non-astronomical, with no explanation evident

   a. Lack of evidence precludes explanation:
   #38, 44, 45, 47, 56, 57, 72, 86, 87, 88, 90, 99, 110, 117, 118, 125, 127, 137, 139, 149, 150, 177, 179, 191, 206, 212, 213, 229, 232, 233.

   b. Evidence offered suggests no explanation:
   #1, 2, 10, 17, 21, 29, 37, 40, 51, 52, 58, 61, 62, 64, 68, 71, 75, 76, 77, 79, 84, 105, 111, 122, 135, 151, 152, 154, 162, 168, 172, 176, 183, 186, 193, 207, 215, 223, 224, 225, 226, 227, 236, 241, 242, 243, 244, 134.

Historical Research Center
Maxwell AFB, AL 36112

PROJECT "GRUDGE"

AUGUST 1949

RETURN TO
The Albert F. Simpson
Historical Research Center
Maxwell AFB, AL 36112

1003282

UNCLASSIFIED

Technical Report

By C J Ruppelt Capt No.

Date 1 Aug 1952

UNIDENTIFIED FLYING OBJECTS
PROJECT "GRUDGE"

RETURN TO
LOWELL AFB AL 36112-AC 15-100

K243.6012
49/08/00

Lt H. W. Smith
Mr. O. W. Towles

SMC

Project No. 13-304
Classification cancelled
or changed to Unclassified
AUTH:
By C J Ruppelt Capt
Signature and Grade
Date 1 Aug 1952

Approved by:

A. J. HEMBLEST, Jr, Lt Colonel, USAF
Chief, Technical Analysis Division
Intelligence Department

For the Commanding General:

EDWARD M. BRYAN, Colonel, USAF
Chief, Intelligence Department

UNCLASSIFIED

Release Date:
August 1949

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UNCLASSIFIED

ABSTRACT

A Technical Intelligence Report covering the method of investigation of unidentified flying objects and results obtained to date is presented.

The report discusses in full the history of the project, the problems encountered, and the procedures followed in the investigation and evaluation of reports of unidentified flying objects. Since the project is continuous in nature, this report comprehensively treats reports of sightings only up to January 1949. Work is continuing on later reports.

FOREWORD

The following individuals and agencies served as consultants in the investigation and evaluation of unidentified flying objects:

1. Dr. J. A. Hynek, Ohio State University -- was under contract from 16 December 1948 to 30 April 1949, Contract No. AF 33 (038)-1118
2. Hq, Air Weather Service, Washington 25, D. C.
3. Dr. G. E. Valley, Scientific Advisory Committee
4. Rand Corporation, 1500 Fourth Street, Santa Monica, Calif.
5. 3160th Electronics Laboratory, Cambridge Field Station, Mass.
6. Dr. P. M. Fitts, Air Materiel Command Aero-Medical Laboratory
7. Weather Bureau, U. S. Department of Commerce

In addition, technical sections of the Analysis and Engineering Divisions, Air Materiel Command, were available for consultation when needed.

INTRODUCTION

This report may be considered as final for the period reported upon. It also indicates the probable future trends of reports of unidentified flying objects.

In gathering and evaluating material for the report, it was found, and will be seen, that the conclusions evolve without effort. No attempt has been made to force evidence into a pattern that was not clearly indicated.

SUMMARY

While there are approximately 375 incidents on record, only incidents Nos. 1 thru 244 are encompassed in this report. Of the later incidents, many have not yet been investigated, few have been completely tabulated, and none have been submitted to the consulting agencies. It is certain that better over-all results will be obtained in the analysis of the later reports, as these incidents generally have been more completely investigated.

Since 5 December 1948, a series of recurring phenomena described as "green fireballs" have been reported in the general vicinity of Albuquerque, New Mexico. Dr. Lincoln La Paz, noted meteoritic expert, has been directly, though unofficially, associated with the investigation of these sightings and has himself observed the phenomena. Dr. La Paz states he is convinced the green fireballs are not ordinary meteors. This group of incidents has little or nothing in common with other incidents on file with Project "Grudge", therefore, these incidents are not considered in this report. The Scientific Advisory Committee was asked to investigate this matter and had advised that an independent investigation be conducted in the field of atmospheric research.

Upon eliminating several additional incidents due to vagueness and duplication, there remain 228 incidents which are considered in this report. Thirty of these could not be explained, because there was found to be insufficient evidence on which to base a conclusion.

Consulting agencies provided plausible solutions for 164 incidents, along with the following comments and findings:

Rand Inc. — (172 Incidents considered) "We have found nothing which would seriously controvert simple rational explanations of the various phenomena in terms of balloons, conventional aircraft, planets, meteors, bits of paper, optical illusions, practical jokers, psychopathological reporters, and the like."

Ohio State University (Dr. Hynek - 244 Incidents considered) Assuming evidences of observers and investigators to be correct, Dr. Hynek concluded that 32% could be explained astronomically, 35% could be attributed to balloons, aircraft, rockets, birds, etc., and 33% either lacked necessary evidence or a suitable explanation was not apparent. When due allowance was made for inaccuracies in observing and reporting, 53% might be explained astronomically.

Air Weather Service (233 Incidents considered)

12.0% apparently were weather balloons.

Air Materiel Command Aero-Medical Laboratory (Dr. Paul M. Fitts - 212 Incidents considered)

There are sufficient psychological explanations for the reports of unidentified flying objects to provide plausible explanations for reports not otherwise explainable. These errors in identifying real stimuli result chiefly from inability to estimate speed, distance, and size.

All of the remaining 34 incidents are treated in detail in this report. These incidents form no pattern in regard to area of sighting, type of object, or manner of performance. There are indications, however, that some sightings were influenced by earlier reports, and probably would not have been considered unusual or reported had there been no publicity.

CONCLUSIONS

1. Evaluation of reports of unidentified flying objects to date demonstrate that these flying objects constitute no direct threat to the national security of the United States.

2. Reports of unidentified flying objects are the result of:

a. Misinterpretation of various conventional objects.

b. A mild form of mass hysteria or "war nerves".

c. Individuals who fabricate such reports to perpetrate a hoax or to seek publicity.

d. Psychopathological persons.

3. Planned release of unusual aerial objects coupled with the release of related psychological propaganda could cause mass hysteria.

a. Employment of these methods by or against an enemy would yield similar results.

RECOMMENDATIONS

1. That the investigation and study of reports of unidentified flying objects be reduced in scope.

a. That current collection directives relative to unidentified flying objects be revised to provide for the submission of only those reports clearly indicating realistic technical applications.

2. That Conclusions 1 and 2 of this report, with sufficient supporting data, be declassified and made public in the form of an official press release.

3. That psychological Warfare Division and other governmental agencies interested in psychological warfare be informed of the results of this study.

a. That such agencies coordinate in and provide further recommendations for public release of material as recommended in Para. 2 above.

FACTUAL DATA

I. Foreign Reports

During the summer of 1946, there were reported to have been seen in Sweden a number of mysterious aerial objects. There were as many different descriptions for the "ghost rockets", as the newspapers tagged them, as there were observers. It soon became quite common for newspapers in Sweden and in the U. S. to refer authoritatively to these objects as guided missiles with the inference that they were test flights from Russia or Russian-dominated areas. The "ghost rockets" were usually seen in hours of darkness, almost always traveling at extremely high speed; shaped like a ball or projectile; bright or incandescent blue, white, red, green, or yellow; sometimes had an associated noise; and were always seen at too great a distance to observe details. By the end of the summer, 1946, an occasional report came out of Denmark, Norway, Spain, Greece, Fr. Morocco, Portugal, and Turkey. Throughout 1947 and 1948, "ghost rocket" reports totalled less than a dozen. None have been received within the past 6 months. These reports reached the public through the press and the radio, they reached the government of the U. S. through Military Attache reports. Attaches had obtained virtually all of their information from European press and radio items.

The Swedish Defense Staff conducted a comprehensive study of the early incidents. Several thousand reports were thoroughly investigated and plotted, with resultant conclusions that all evidence obtained of sightings were explicable in terms of astronomical phenomena. Since that time, although the Swedes themselves show little concern, they attempt to play up their incidents to the United States, obviously to emphasize their request for radar (see Appendix "A").

II. Early American Reports

The first American report of unidentified objects to receive wide publicity and to cause some national concern was that of Kenneth Arnold of Boise, Idaho. Arnold described the objects as "saucer-like discs" and this is evidently the origination of the much-used terms "flying saucers" and "flying discs". This incident is Number 17 in the project files. The date of sighting is given as 24 June 1947. Arnold's story appeared in many newspapers throughout the country. He even wrote a series of articles about this sighting for "Fate" magazine. This periodical styles itself a "cosmic reporter" and delves into the supernatural and fantastic.

Within the month following Arnold's report, the number of incidents reached a peak that remained unsurpassed for any like period covered by this report. (This peak was, however, surpassed in May 1949, following an Air Force press release and a series of articles in the Saturday Evening Post concerning flying objects. A few individuals later reported having seen objects prior to the Arnold incident.

Since August 1947 until the present, except May 1949 as noted above, the number of reports maintained a monthly average of approximately twelve, with occasional up-surges often directly attributable to an unusual or overly publicized report.

III. Air Force Cognizance of Unidentified Aerial Objects

In September 1947, the Air Force was forced to take official cognizance of the "flying discs" because of increasing demand from the public for an explanation, and as a result of certain publications persisting in using a sensational approach in reporting such items, and often implying that something subversive, dangerous, and fearful was upon us.

Hq. AMC in a letter dated 23 September 1947, requested the Commanding General, Army Air Forces, to issue a directive assigning a priority, security classification and code name for a detailed study of flying disc reports. Hq. AMC explained that their action was based on the opinion that the phenomena reported appeared to be real. Awaiting a specific directive, Hq. AMC collected information on flying disc incidents in order to more clearly define the nature of the phenomena. On the 22nd of December 1947, in a memorandum, "Analysis of Flying Disc Reports", the Director of Intelligence, Hq. USAF, concurred with AMC recommendations and forwarded them to the Director of Research and Development, DCS/M, Hq. USAF, for reply to the Commanding General, AMC. In a letter dated 30 December 1947, the Director of Research and Development, DCS/M, advised the Commanding General, AMC, that Air Force policy was not to ignore reports of sightings and phenomena in the atmosphere. To implement this policy, AMC was directed by Hq. USAF, to set up a project with the purpose of collecting, collating, evaluating, and distributing to interested government agencies and contractors, all information concerning sightings and phenomena in the atmosphere which might be construed to be of concern to the national security. This directive assigned a priority of 2A to the project, a RESTRICTED classification and a code name of "Sign". (The code name of "Sign" for the project was changed to "Grudge" by a 16 December 1948 request of the Director of Research and Development, DCS/M. "Grudge" under the U.S. Joint Services code word index refers to the title "Detailed Study of Flying Discs".) As a result of the directive from Hq. USAF for establishment of the special project, Hq. AMC Technical Instruction No. 2165, dated 11 February 1948, was published and assigned responsibility for the project activities to the Technical Intelligence Division, Intelligence Department, Hq. AMC.

Department of Air Force and Department of Army letters directed all respective subordinate units to report directly to Air Materiel Command all information concerning unidentified flying objects. Air Intelligence Requirements Memorandum No. 4 was published 15 February 1949 at the request of Air Materiel Command in an effort to obtain more comprehensive and accurate information.

IV. Project Administration

At the outset, project personnel proceeded by air to the scene of a reported sighting to personally interrogate witnesses. This was not

entirely satisfactory, due to the fact that the number of personnel available was not sufficient to cover each report adequately and have time for recording and analysing material collected. Furthermore, it was learned that project personnel could not be well enough versed in all the technological and scientific fields involved in this study to efficiently execute all phases of this work. Therefore, in September 1948 the method of operation of the project was revised. Enough experience had been gained to make it evident that a large proportion of disc reports arose from sightings of unfamiliar objects and failure to recognize known objects for what they were. The course then became apparent. It has since been the endeavor to have adequate investigations of all reports, systematic tabulation of all information, and analysis of information by competent technical personnel in all branches of science and engineering into which the reported object may conceivably fall. In this way misrepresented and generally unfamiliar objects, hoax makers, and psychopathological reporters may be identified, and these reports eliminated from the study. With these out of the way, the succeeding steps would develop.

In implementing the above plan, the following general procedure was established and followed:

A. Receipt of Initial Reports

1. Personal letter and personal contact.

2. Newspaper clippings and radio news broadcasts.

3. Reports from military and naval installations, (as a result of official directives; these make up the largest bulk of reports).

B. Investigation of Reports

1. A few reports are investigated by Headquarters, Air Materiel Command personnel, ATI field teams or project personnel.

2. When a sighting involves only military personnel, especially in out-of-the-way locations, local base intelligence officers are requested to investigate.

3. The largest number of reports are investigated by the appropriate CSI District, by request through 5th District CSI.

4. All investigators are instructed to use AMC form titled, "Guide to Investigation Unidentified Flying Objects" to assure collection of all available, pertinent information. The Guide to Investigation is frequently revised to incorporate recommendations of technical consultants to the project.

C. Recording of Information After Receipt of Report of Investigation

1. Upon completion of investigation, the reported sighting is then treated as an incident and assigned a consecutive number.

Its location and configuration is then plotted. Statistical graphs are brought up to date.

2. Information for locating and comparing is recorded on card files by witness, and on a tabular sheet for convenient study.

3. Pertinent information is extracted, condensed, and compiled on an Incident Summary Sheet, which is similar to the first two pages of the Guide to Investigation.

4. Entire incident files are microfilmed, in order that technical consultants will have access to all available information if desired.

5. Data is collated against monthly blimp flight reports, Airline schedules, information on ball lightning, and other known aerial objects.

L. Consultants

Since, as stated above, there were indications that some sightings could be attributed to natural phenomena, conventional aircraft and aerial vehicles, birds, lights, clouds, etc., effort was made to have all material analyzed by individuals in all technical fields that might conceivably be touched upon. These individuals and agencies include the following (only those agencies which provided usable results are considered):

1. Dr. J. A. Hynek, Astronomer, Ohio State University was awarded a contract, effective 16 December 1948 to 30 April 1949, for the purpose of attempting to determine which reported objects might be attributed to natural celestial phenomena.

2. Headquarters Air Weather Service was requested to review each incident to determine those which may have been weather balloons by comparison of release and weather data with time of sighting, description of object, and its maneuvers.

3. Dr. G. E. Valley, Scientific Advisory Board. Since many reporters colored their reports with talk of ray, electronic beams, and magnetic support and propulsion, Dr. Valley was asked to analyze the incidents and decide whether this could possibly be the case in any instance, and to provide information on this matter.

4. Rand Corporation was requested to analyze each incident and provide any reasonable explanation that could be determined from the evidence given. Rand also provided a discussion of the possibility of visitations by beings from other planets.

5. 3160th Electronics Laboratory, Cambridge Field Station, studied all incidents by comparing evidence with research balloon data, to determine which incidents may be attributed to various types of research balloons.

6. Dr. P. M. Fitts, Psychologist, AMC Aero-Medical Laboratory was requested to review all material relative to sightings and to provide psychological and illusory information and determine human capacity for observing and remembering minute details of range, speed, size, etc.

While these analyses were being conducted, the Swedish Defense Staff was contacted through our Air Attache to learn the official Swedish attitude toward the "ghost rockets". The results of these requests are contained in AA Reports, No. IR-115-48, 30 December 1948, and No. IR-47-49, 2 March 1949 (listed as Appendix "A").

V. Discussion of Reports of Consulting Agencies

A. Dr. J. A. Hynek, Final Report (see Appendix "B"). Dr. Hynek's report includes the results of a concentrated study of all files up to and including Incident No. 244. However, as mentioned above, Incidents 223 through 227 and 241 through 244, in the New Mexico area, will not be considered in this analysis. An additional seven incidents were excluded by Dr. Hynek as explained in his Summary on Page 4 of Appendix "B". Of the remaining 228 then treated, Dr. Hynek concluded that approximately 33% were astronomical with varying degrees of probability. He concluded that an additional 37% were not astronomical but suggestive of other explanations, such as birds, rockets, balloons, ordinary aircraft, etc. The remaining 30% as far as Dr. Hynek was concerned either lacked sufficient evidence or evidence offered suggested no explanation. In compiling these statistics, Dr. Hynek cautiously accepted each case at face value, without discounting evidence that sometimes "verged on the ludicrous" and without taking into consideration psychological factors. Dr. Hynek then stated that "53% might conceivably be considered (although the likelihood of their being so may be very small) as extra-terrestrial or astronomical in origin". These include "those which either are definitely astronomical or can by suitable manipulation of the evidence be construed as such".

B. Hq. Air Weather Service, one indorsement and one letter (see Appendix "C") Air Weather Service conducted an analysis simultaneously with Dr. Hynek using the same evidence. AWS attempted to determine whether a synoptic weather balloon could have been at the location where a sighting was reported.

In this investigation consideration was given to the wind direction and speed at the surface and aloft at the scheduled time of balloon release, and the location of the nearest weather station making balloon observations. AWS used files of the first 233 incidents.

These include five of New Mexico fireballs and the seven incidents that duplicated others or had no information. Therefore, 221 incidents are considered here. Of these, AWS concluded that 31 incidents could have been synoptic balloons, four of these were incidents that Dr. Hynek could not explain. In addition, AWS determined that ten more incidents could be attributed to astronomical phenomena. A discrepancy is noted in that, of the 31 which AWS concluded were balloons, Dr. Hynek has listed six as possible meteors. In the remaining 25, AWS and Dr. Hynek were in close agreement.

NOTE: The project files contain listing of over 200 weather stations within the U.S.A. A conservative estimate of balloon releases by these stations alone would number well over 500 per day.

C. Dr. G. E. Valley, General Study (Appendix "D"). Dr. Valley was requested to review all reports (Incident No. 1 thru 172 incl.) and provide any possible explanation. At the same time, he considered the possibility of supporting and propelling a solid object by unusual means. (It will be noted that Dr. Valley's theories along these lines very closely parallel those of J. E. Lipp, Rand Corporation, Appendix "E".)

D. Rand Corporation, letter, 13 December 1948, and letter, 29 March 1949 (Appendix "E"). Rand provided a discussion of the special design and performance characteristics that are believed to distinguish space ships. Rand received files on Incidents No. 1 thru No. 233 for general analysis. Although the final report from Rand has not yet been received, Rand reported, in a letter (Appendix "E") based on study of the first 172 incidents, "to date, we have found nothing which would seriously controvert simple rational explanations of the various phenomena in terms of balloons, conventional aircraft, planets, meteors, bits of paper, optical illusions, practical jokers, psychopathological reporters, and the like."

E. 3160th Electronics Laboratory, Cambridge Field Station (Appendix "F"). The Electronics Laboratory reviewed Incidents No. 1 thru No. 172 to determine whether any may have been sightings of special research balloons. The Laboratory showed that 18 could possibly have been their balloons. Dr. Hynek's analysis did not conflict with any of these, and in some cases served as slight confirmation. However, of the 18, three were thought to have been synoptic balloons. It was learned while obtaining this information, that numerous universities and laboratories are engaged in various types of research requiring the use of balloons. Even when the balloons are recovered, there is no certain way of determining their exact path.

F. Dr. P. M. Fitts, Air Materiel Command Aero-Medical Laboratory (Appendix "G"). Dr. Fitts studied 212 incidents from a psychological point of view and concluded "that there are sufficient psychological explanations for the reports of unidentified objects to provide

plausible explanations for reports not otherwise explainable." Review of Dr. Fitt's report reveals that this conclusion is warranted, despite its presumptuous sound. Dr. Fitts provided plausible explanations in six specific reports, one agreed with AWS, four agreed with Dr. Hynek, and one Dr. Hynek could not explain and AWS did not mention.

C. U. S. Department of Commerce Weather Bureau (Appendix "H").

The Weather Bureau provided much information on the phenomenon of ball lightning and lightning in general. These phenomena cannot be ruled out entirely. However, none of the recorded incidents appear to have been lightning.

VI. Summary of Results of Consultants

It can be stated with certainty that unidentified objects are many different types of objects and not multiple sightings of the same object or the same type object.

It is realized that none of the explanations given constitute positive scientific proof. Such proof might be possible were fragments recovered or were damage to property or injury to personnel sustained in any instance. On the other hand, almost every incident has less than legal proof that an object was seen, or that an object appeared or performed as described. Even in those cases where more than one witness reported, all witnesses seldom agreed on details.

In view of the foregoing, the explanations provided by consulting agencies are accepted as solutions to the respective incidents.

Of the 226 incidents under consideration in this report, 30 must be disregarded for lack of workable evidence. Eight were extracted from press and radio accounts and are hardly more than rumors. In the investigation of five others, the observers were found to have possessed too vivid imaginations, were of low intelligence, or were morally questionable. It is reasonable to assume that if these thirty incidents had contained sufficient information a proportionate number could be explained as were the 164 incidents that have been explained.

With 194 incidents thus eliminated, there remain thirty-four which contain some evidence but have no apparent ready explanation. This statement is true only under the assumption that the evidence is accepted as reliable and accurate. When psychological and physiological factors are taken into consideration, all of these incidents can be explained rationally, as pointed out by Rand Corporation and Dr. Fitts of Air Materiel Command Aero-Medical Laboratory (see Appendixes "E" and "G").

VII. Summary of AMC Evaluation of Remaining Reports

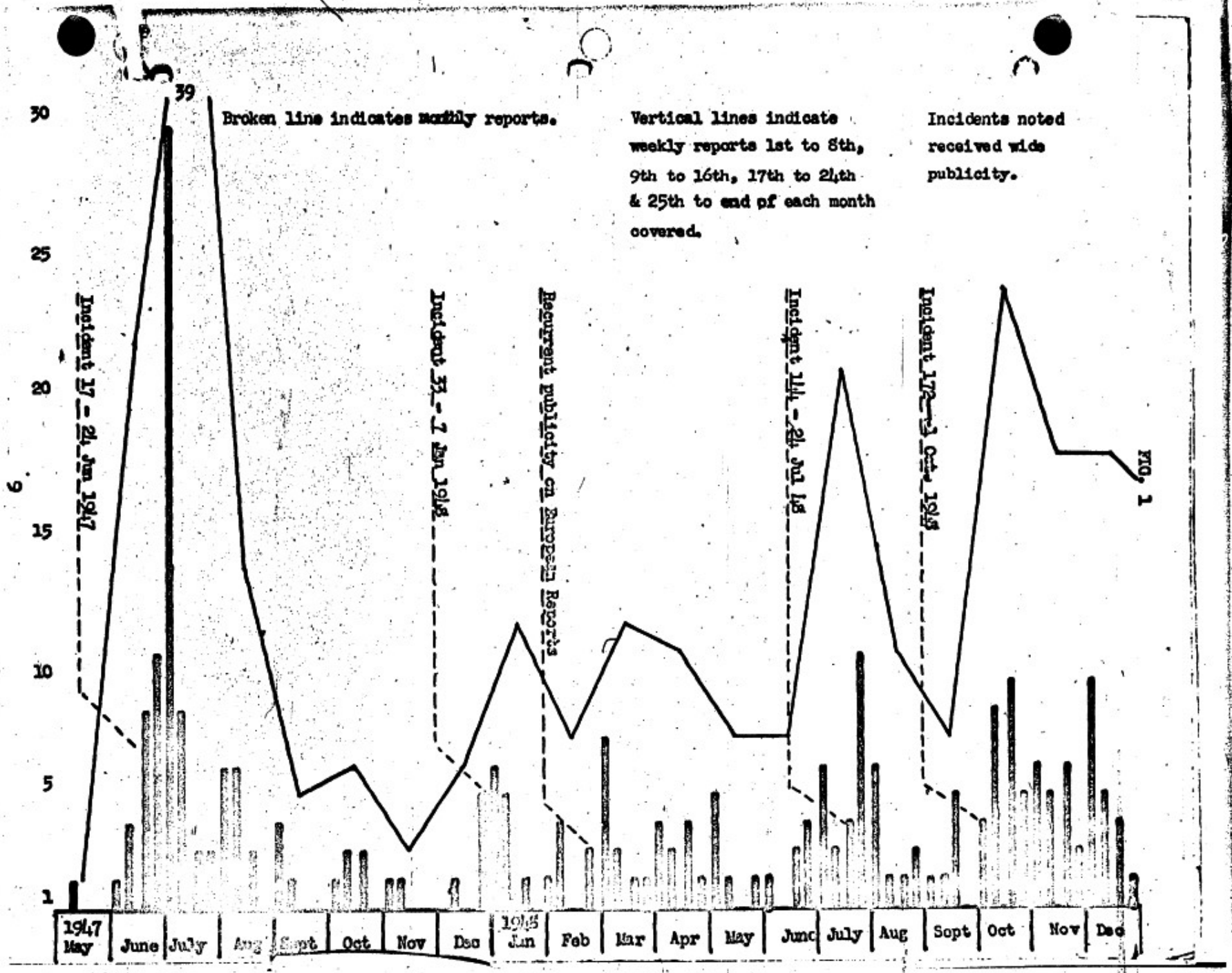
The remaining unexplained incidents (see Appendix "I") exhibited few common characteristics. Two of them, by statements of the reporters, would not have been made had the witnesses not read of the Mt. Ranier

incident (Incident No. 17). Most were distributed without pattern throughout the United States. A few were outside the U. S. No two descriptions of appearance or performance were exactly alike. The reported sightings occurred at various times of day and year.

VIII. Relationship Between Publicity and Dates of Reports

The following graph (Fig. 1) illustrates an apparent relationship between reports which received wide publicity and the total number of reports. It is believed this has been carried to a sufficient degree to allow the conclusion that many reports are the direct result of such publicity.

This was further illustrated recently, when this Command received 64 reports of sightings and 51 possible solutions following a Saturday Evening Post article and an official press release on the subject of flying objects. Virtually all of the reporters and correspondents made reference to one of the above mentioned articles.


Broken line indicates monthly reports.
Vertical lines indicate weekly reports 1st to 8th, 9th to 16th, 17th to 24th & 25th to end of each month covered.
Incidents noted received wide publicity.
39
30
25
20
15
10
5
1
Incident 17 - 24 Jan 1947
Incident 33 - 7 Jan 1948
Recurrent publicity on European Reports
Incident 114 - 24 Jul 48
Incident 172 - 6 Oct 1948
No. 1
1947 May
June
July
Aug
Sept
Oct
Nov
Dec
1948 Jan
Feb
Mar
Apr
May
June
July
Aug
Sept
Oct
Nov
Dec

APPENDIX A-1

Air Intelligence Information Report No. I2-115-48

UNCLASSIFIED

AF FORM 112—PART I
APPROVED 1 JUNE 1948

(CLASSIFICATION)

COUNTRY	REPORT NO.	(LEAVE BLANK)
SWEDEN	IR 115-48	

AIR INTELLIGENCE INFORMATION REPORT

SUBJECT		
Project "SIGN"		AF-33165-1
AREA REPORTED ON: Sweden	FROM (Agency): OAA-Sweden	
DATE OF REPORT: 30 December 1948	DATE OF INFORMATION: 29 December 1948	EVALUATION: B-2
PREPARED BY (Officer): Donald L. Hardy, Colonel, USAF	SOURCE: Swedish Defense Staff	
REFERENCES (Control number, directive, previous report, etc., as applicable): Source Control No. AMC-435		

SUMMARY: (Enter concise summary of report. Give significance in final one-sentence paragraph. List inclosures at lower left. Begin text of report on AF Form 113—Part II.)

1. The Swedish Defense Staff has no proof that any unidentified flying objects, missiles or vehicles have passed over or near Sweden to date.

2. All reports of sightings in Sweden during the past year, irrespective of to whom they were submitted, have been funneled to a special section of the Defense Staff, where the sightings were plotted. In each case an exhaustive interrogation of the sighter followed, somewhat along the lines of the EEI for Project "SIGN". All evidence obtained of sightings was explicable in terms of astronomical phenomena.

3. In addition, 3 ground radar stations and 2 radar equipped destroyers cooperated in maintaining watch. The radar equipments were Swedish modified British sets of fairly short range and were not operated on a 24 hour basis; however, no unexplained sightings were made with this equipment.

4. Conclusion: Although the possibility exists that objects have traversed Sweden and its adjacent waters, no proof has been obtained to confirm such flight in any instance.

COMMENT: The cooperation of the Defense Staff in securing this information was undoubtedly given in an effort to emphasize their need for additional U.S. radar equipment. The Swedish Air Board had previously negotaited with the Bendis Corporation for 20 TPS-1a sets but had been refused an export license by our State Department. The members of the Defense Staff, to whom I talked, were eager to point out the good use to which such equipment could be put for both ourselves and the Swedes as instanced by our mutual interest in unidentifiable flying objects. However, I am convinced that our refusal to grant an export license for such equipment will do more good in implementing our national policy, as expressed in the National Security Council documents NSC 26/1, than would the information we might receive from the use of such equipment here.

/s/ Donald L. Hardy
DONALD L. HARDY
Colonel, USAF
Air Attache

WCS

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APPENDIX A-2

Air Intelligence Information Report No. IR-47-49

UNCLASSIFIED

(CLASSIFICATION)

AF FORM 112—PART I
APPROVED 1 JUNE 1948

COUNTRY	REPORT NO.	(LEAVE BLANK)
SWEDEN	IR 47-49	

AIR INTELLIGENCE INFORMATION REPORT

SUBJECT: Guided Missile Activity Over Sweden

AREA REPORTED ON	FROM (Agency)
Sweden	OAA-Sweden

DATE OF REPORT	DATE OF INFORMATION	EVALUATION
2 March 1949	2 March 1949	B-2

PREPARED BY (Officer)	SOURCE
H. B. Walsh, Major, USAF	Personal Contact

REFERENCES (Control number, directive, previous report, etc., as applicable)
R 605-48, Control No. DA-244

SUMMARY: (Enter concise summary of report. Give significance in final one-sentence paragraph. List inclosures at lower left. Begin text of report on AF Form 113—Part II.)

1. With reference to request dated 18 January 1949, Control No. DA-244, and revised by our cable, the following information is submitted:

a. Withdrawn (AFOIN Cable 51648 dated 21 February 1949)

b. Do the Swedes feel that the reported and unconfirmed incidents of guided missile sightings in recent years have any similarity to any such reports that were received in the days when Germany was conducting experiments with missiles in the Baltic area.

Answer: The Swedes feel that the guided missile sightings over Sweden have been natural phenomena only and they have no proof to discount such a statement.

c. What was Swedish official opinion to unconfirmed guided missile incidents prior to the time that debris of a V-2 missile was actually recovered in Sweden during German experimentation activities in the early part of World War II.

Answer: Swedish official opinion prior to the landing of a V-2 in Sweden, was that a certain number of the "missile sightings" were natural phenomena and a certain number were German fighters at high altitude enroute across Sweden to Norway. This view in fact remained the official opinion even after the V-2 missile landed in Sweden.

Assistant Air Attache Comment: The Sweden actually do not think very much about these reported incidents but attempt to play it up as much as possible to the U. S. Attaches in an effort to show their great need for radar. Continued interest, therefore, on our part towards the last reported incidents, only causes extreme embarrassment when the Swedes emphasize their radar request.

S/ H. B. Walsh
Major, USAF
Assistant Air Attache

APPROVED:

S/ DONALD L. HARDY
Colonel, USAF
Air Attache

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APPENDIX B

Prof. J. A. Hynek - Final Report, Project 364

[redacted]

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MAPPING, CHARTING AND RECONNAISSANCE RESEARCH LABORATORY

FINAL REPORT
PROJECT 364

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REPORT ON UNIDENTIFIED

AERIAL AND CELESTIAL OBJECTS

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INTRODUCTION

Perhaps the most bizarre post-war phenomenon was the sudden barrage of reports, in the summer of 1947, describing unidentified objects in the sky. The incident which evidently triggered the volley was the now-famous account by Kenneth Arnold, in which he claimed to have seen "nine peculiar-looking aircraft" without tails, which flew in a chain-like line and "swerved in and out of the high mountain peaks." The handling of this incident by the press led to the unfortunate but descriptive term "flying saucer," which caught the public imagination. From that time on, there has been a fairly steady stream of similar reports, including some of "flying saucers" seen prior to the Arnold incident, which presumably otherwise would have gone unreported. (It is pertinent, therefore, to speculate whether any of the incidents would have been reported if Mr. Arnold had not made his observation.) Possibly, of course, we deal here with an excellent example of mass hysteria. In the interests of the defense of the country, however, it would be highly inadvisable to ignore the accounts, even though the chance be remote that they contain anything inimical to the nation's welfare. To this end, the present investigator, as an astronomer, was asked to review the data, to eliminate the patently astronomical incidents and to indicate which others might have such an explanation.

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GENERAL PROCEDURE

The method of the investigation was to examine a number of individual reports of unidentified aerial and celestial objects, to determine which of them could be explained on purely astronomical lines -- that is, how many cases give evidence corresponding to descriptions of meteors, fireballs or bolides, comets, the planets, or even the sun or moon. Analysis was based entirely upon these reports, furnished by Project GRUDGE offices, with no attempt to make independent interrogation of witnesses, since this was not authorized under the contract. Nor was any attempt made to deduce explanations for the non-astronomical incidents, although hypotheses which appeared possible from the evidence were noted.

The subject reports number 244 and cover, approximately, the period from January, 1947, to January, 1949. They do not, however, correspond exactly to the number of separate incidents: sometimes, two or more reports refer to the same object observed by different people (although in general such cases have been handled by affixing letters to the incident numbers, thus: 33, 33a, 33b); occasionally, subdivisions of one number patently refer to separate phenomena. To avoid confusion, one report is being submitted by this investigator for each numbered incident, with cross references for identical or similar incidents, and separate discussions for those including more than one phenomenon.

Inasmuch as the avowed object of the investigation was

solely to indicate the possible astronomical content of the reports at hand, in the primary analysis all evidence was accepted at face value, with no attempt to evaluate psychological factors. Frequently, however, when fairly liberal limits of tolerance were allowed, the report made sense physically, whereas the literal statement did not. (Whenever allowance was made for possible errors arising from subjective reporting, the fact was noted.) Furthermore, while some of the reports verge on the ludicrous, the attitude deliberately adopted was to assume honesty and sincerity on the part of the reporter. Among the general public, two attitudes toward "flying saucers" seem to be prevalent: one, that all are obviously illusions, hallucinations, or hoaxes; the other, that "there must be something to it." From the outset, this investigator has attempted to regard each report, insofar as is logically possible, as an honest statement by the observer, and to adhere to neither of the two schools of thought.

One further comment should be made: almost all of the data dealt with in this investigation are extremely tenuous. Many of the observers' reports are incomplete and inexact, and some are distinctly contradictory. Therefore, it has obviously been impossible to reach definite, scientific conclusions. Most explanations are offered in terms of probability, the degree of which is discussed in the individual reports, but can be indicated only generally in the statistics which follow.

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SUMMARY OF RESULTS

What, in particular, was gathered from the evidence concerning the astronomical character of the objects observed?

Of the 244 incidents submitted, 7 are excluded from all statistical reckoning: 1 is identified (in the subject report) as a hoax, 3 are duplicates, and 3 contain no information. In summarizing the findings in the remaining 237, two systems of classification are possible:

First, all incidents can be placed in one of two classes: 1) those which under no stretch of the imagination can be regarded as astronomical or extra-terrestrial (extra-terrestrial throughout this investigation refers solely to natural objects not originating on earth; it does not include "space ships from other planets"), and 2) those which either are definitely astronomical or can by suitable manipulation of the evidence be construed as such. The object here is to segregate all cases in which any vestige of astronomical origin is indicated. When this division is made, 111, or 47%, fall into the definitely non-astronomical category; or, conversely stated, 126, or 53%, might conceivably be considered (although the likelihood of their being so may be very small) as extra-terrestrial or astronomical in origin. The exact percentage is not important. The significant thing is that over 50% of the incidents might possibly be explained astronomically, if wide enough tolerances were allowed.

The primary purpose here, however, is to segregate incidents which have a reasonable degree of certainty of astronomical origin. Therefore, in a second, more detailed breakdown, incidents are placed in one of three classes, according to the most probable interpretation seen in the evidence offered (with a minimum of allowance for subjective observation). Class 1 includes the astronomical incidents (with degree of probability indicated). The non-astronomical incidents are divided into two classes, because it appeared as the work progressed that they fell naturally thus: in some, the evidence at hand suggested a simple explanation; in others, it did not. Listings under class 2 are not to be considered in any way decisive (with the exception of a few which, according to subject reports, have been definitely identified); they are offered as suggestions.

A summary of the results of this breakdown is shown in the table on the following page.

Class	Number of incidents	Approximate percentage
1. Astronomical		
a. High probability	42	18
b. Fair or low probability	33	14
Total	75	32
2. Non-astronomical but suggestive of other explanations		
a. Balloons or ordinary aircraft	48	20
b. Rockets, flares, or falling bodies	23	10
c. Miscellaneous (reflections, auroral streamers, birds, etc.)	13	5
Total	84	35
3. Non-astronomical, with no evident explanation		
a. Lack of evidence precludes explanation	30	13
b. Evidence offered suggests no explanation	48	20
	78	33

According to these findings, 78, or almost one-third, of the 237 incidents yet remain without an appropriate hypothesis for explanation. It is likely, of course, that with additional evidence a number of those included in class 3a would be easily explained (some of them, probably, astronomically). There are, however, at least 48 incidents in which the evidence, if correct as given, does not fit any simple explanation, and a number of these were reported by presumably well-qualified observers.

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INCIDENT INDEX

1. Astronomical

   a. High probability:
   #26, 27, 30, 31, 32, 33, 34, 48, 49, 59, 60, 66, 69, 70, 94, 95, 96, 97, 98, 101, 102, 103, 104, 116, 119, 132, 136, 140, 147, 148, 158, 174, 184, 185, 187, 197, 203, 204, 208, 216, 219, 238.

   b. Fair or low probability:
   #19, 20, 23, 24, 28, 35, 36, 46, 50, 63, 67, 80, 82, 93, 100, 112, 120, 121, 129, 130, 144, 153, 165, 166, 167, 175, 192, 199, 202, 205, 220, 230, 240.

2. Non-astronomical but suggestive of other explanations

   a. Balloons or ordinary aircraft:
   #3, 11, 22, 41, 42, 53, 54, 73, 81, 83, 91, 92, 113, 114, 115, 126, 131, 138, 141, 145, 155, 156, 157, 159, 160, 161, 163, 169, 171, 173, 178, 180, 182, 188, 190, 194, 195, 196, 198, 200, 201, 209, 210, 217, 222, 236, 237, 239.

   b. Rockets, flares or falling bodies:
   #4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 25, 56, 65, 78, 106, 107, 108, 109, 133, 170, 211, 218.

   c. Miscellaneous (reflections, auroral streamers, birds, etc.):
   #39, 89, 123, 124, 128, 146, 164, 181, 189, 214, 221, 231, 234.

3. Non-astronomical, with no explanation evident

   a. Lack of evidence precludes explanation:
   #38, 44, 45, 47, 55, 57, 72, 86, 87, 88, 90, 99, 110, 117, 118, 125, 127, 137, 139, 149, 150, 177, 179, 191, 206, 212, 213, 229, 232, 233.

   b. Evidence offered suggests no explanation:
   #1, 2, 10, 17, 21, 29, 37, 40, 51, 52, 58, 61, 62, 64, 68, 71, 75, 76, 77, 79, 84, 105, 111, 122, 135, 151, 152, 154, 162, 168, 172, 176, 183, 186, 193, 207, 215, 223, 224, 225, 226, 227, 236, 241, 242, 243, 244, 134.

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COLLATERAL STUDIES

In relation to the investigation, besides the individual analyses of separate incidents, two brief studies were conducted:

Certain breakdowns of the subject reports were made, for the purpose of determining whether they include any prevalent characteristics; for example, incidents were grouped according to the date of occurrence, the hour, the presence or lack of noise, presence or lack of trail or exhaust, number of observers, general qualifications of observers (whether with appropriate training for accurate observation of aerial phenomena -- aviators, weather observers, etc.; or laymen). Although these classifications were helpful in spotting identical or similar incidents, they revealed no pertinent trends.

As a matter of general interest, the highly dubious works of Charles Fort (which, as has been stated in a previous report, are entirely reprehensible in viewpoint, but which do contain accounts of unusual aerial sightings over a period of many years) were examined, to check whether any of the reasonably authenticated incidents are similar to these recent reports. It was found, however, that Mr. Fort's accounts do not include sufficient specific evidence to reveal positive similarities, and the most that can be said of the works is that they indicate that strange objects in the sky have been reported long before this post-World War II flurry.

RECOMMENDATIONS

This investigator would like to offer three recommendations, one in the general interest of the nation's airmen, and two as aids toward more effective investigation of the problem of unidentified aerial objects, if such work is continued:

First and foremost, it is definitely recommended that Air Forces personnel be apprised of simple astronomical phenomena like the recurrent brilliance of Venus and the characteristics of a typical fireball, so that much confusion and alarm and even possible tragic consequences can be avoided. If, as seems possible, Lieutenant Mantell met his death while attempting to chase down Venus, certainly the need for such basic education is great.

Second, if Project GRUDGE is authorized to extend its investigations, it might be found profitable to interrogate personally varied trained personnel concerning any untoward aerial objects which they may have observed in the past. Many competent observers might hesitate to take the initiative in reporting such phenomena for fear of ridicule or criticism, yet it is only from such people that accurate and meaningful descriptions can be obtained; reliance on the general public for such observations is almost certain to prove of little value. It would be of considerable aid to know whether (aside from the few cases reported here) experienced pilots, weather observers, and other "watchers of the sky" have ever found unidentified objects there. Even negative results would prove valuable, for they would offer evidence for the belief held by many that the unexplained

incidents do not really involve tangible physical objects.

Third, if this type of investigation is to be continued, men with proved scientific and technical ability should be assigned to carry out the interrogations and investigations; it would be preferable either that the interrogator and technical specialist be the same person or, at least, that they work together in close harmony. Such an arrangement would aid greatly in lessening the incompleteness and inexactness of evidence which has thus far hindered the explanation of many "flying saucer" incidents.

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Incident #1, 1c, 1d, 1e -- Muroc, California -- 8 July 1947

No astronomical explanation for this incident is possible. It is tempting to explain the objects as ordinary aircraft observed under unusual light conditions, but the evidence of the "tight circle" maneuvers, if maintained, is strongly contradictory. This incident must be judged with reference to other similar incidents, which probably have a common explanation.

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Incident #2, 2a -- Muroc, California -- 8 July 1947

No astronomical explanation is possible for this incident. The object's slow speed and apparent size suggest aircraft under unusual light conditions, but the tactics argue against this interpretation.

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Incident #3 -- Aurora, California -- 7 July 1947

There is no astronomical explanation of this incident.

In this investigator's opinion, there is nothing in the evidence offered that is basically contradictory to the hypothesis of a weather balloon. Perhaps ascending currents of warm air over the desert could give the illusion that the object was oscillating.

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Incident #4 -- Rogers Dry Lake, California -- 8 July 1947

There is no astronomical explanation for this incident. Is there any definite reason why the object observed could not have been a bursted weather balloon?

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Incident #5 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident, nor for numerous others (#6, 7, 8, 9, 12, 13, 14, 15, 16) which occurred in and near Portland on the Fourth of July, 1947.

Besides being observed in the same vicinity and most of them at the same time, the objects seen have in common a round shape, "terrific" speed, abrupt tactics, and quick disappearance. Abrupt tactics certainly suggest that the objects were of a very light weight.

This investigator can offer no definite hypothesis, but in passing would like to note that these incidents occurred on the Fourth of July, and that if relatively small pieces of aluminum foil had been dropped from a plane over that area, then any one object would become visible at a relatively short distance. Even moderate wind velocities could give the illusion that fluttering, gyrating discs had gone by at great velocities. Various observers would not, of course, in this case have seen the same objects.

The above is not to be regarded as a very likely explanation but only as a possibility: the occurrence of these incidents on July 4 may have been more than a coincidence. Some prankster might have tossed such objects out of an airplane as part of an Independence Day celebration.

If these were aircraft of either known or unknown type,

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it would be difficult to explain their appearance over only one locality and at only one time, their apparent random motion, the lack of any sound or obvious propulsion method, and the lack of aerodynamic construction.

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Incident #6 -- Milwaukee, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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Incident #7 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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Incident #8,8a -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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Incident #9 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #6.

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Incident #10 -- Boise, Idaho, 4 July 1947

There appears to be no astronomical explanation for this incident.

One minor lead is suggested: observation was made at the time of sunset, when light conditions are changing rapidly. Disappearance of the object might have occurred simply because of the changing visibility. It is the time of day when illusory effects are most likely to occur, and it might not be out of the question that the objects actually were other aircraft.

Despite these conjectures, no logical explanation for the incident seems possible at this time.

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Incident #11 -- Seattle, Washington -- 4 July 1947

There is no astronomical explanation for this incident. The description answers that of a "hot air balloon," such as those launched at Fourth of July celebrations. There is nothing in the evidence given which is contradictory to this hypothesis.

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Incident #12 -- Vancouver, Washington -- 4 July 1947

There is no astronomical explanation for this incicent.

See report on incident #6.

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Incident #13 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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Incident #14 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #5.

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Incident #15 -- Portland, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #8.

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Incident #13 -- Mt. Jefferson, Oregon -- 4 July 1947

There is no astronomical explanation for this incident.

See report on incident #6.

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ARNOLD 1947

Incident #17 -- Mt. Rainier, Washington -- 24 June 1947

There appears to be no astronomical explanation for this classic incident, which is the prototype of many of the later flying saucer stories.

It is impossible to explain this incident away as sheer nonsense, if any credence at all is given to Mr. Arnold's integrity. However, certain inconsistencies can be pointed out in the facts as reported:

Arnold's attention was first drawn to the objects by a bright flash on his plane, which was followed by numerous other similar flashes. If these were something like the flash one gets from a distant mirror, it means that the reflection was specular, or direct. For a direct reflection, the angle between the observer, sun, and object must be "just right," and at such distances as 20 or 25 miles, the chance of a series of direct reflections is extremely small. If the object was a diffuse reflector -- that is, scattering the sunlight falling on it, much as the moon or a balloon does -- then at such a distance it seems quite unlikely that Mr. Arnold would have been startled, or that our attention would have been called to it, unless the objects reflecting were extremely large.

The supersonic speeds called for if the estimated distance is correct also throw suspicion on the original calculations; by computation (see below) it can be seen that, considering the detail which Arnold observed in the objects, at least one of his estimates

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must have been erroneous:

Arnold states that the objects seemed about 20 times as long as wide. Let us assume that the thickness was just discernible, which means that the object was just at the limit of resolution of the eye. Now, the eye cannot resolve objects that subtend an angle of appreciably less than 3 minutes of arc, and, in general, for any detail to be seen at all, the angle subtended must be much greater. Even if we assume the limiting resolution of 3 minutes, then, if the distance was 25 miles, elementary calculations show that each object must have been at least 100 feet thick, and if, as Arnold's drawings indicate, the object was some 20 times longer than wide, it must have been about 2000 feet long.

Looking at the matter in another way and assuming that Arnold's estimate of distance as 20 to 25 miles (12[illegible],000 feet) and his estimate of length as 45 to 50 feet are both correct, then it can be shown that the object will subtend an angle of only about 80 seconds of arc, which is definitely below the limit of resolution of the eye.

If Arnold actually saw the objects, and if his estimate of distance is correct, that of size cannot be, and <u>vice versa</u>. It seems most logical to assume that his estimate of distance is far too great. In fact, assuming a reasonable limiting size to the objects of 400 feet, in order to show the detail that Arnold's drawings indicate, the distance must have been not over roughly six miles. At this distance the objects would have travelled 11 miles (rather than 47 miles) in 102 seconds, or at a rate of approximately 400 MPH. (Arnold's

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original estimate is also incorrect; if the objects had travelled 47 miles in 102 seconds, they would have been travelling at a rate of approximately 1700 MPH, not 1200.)

In view of the above, it appears probable that whatever objects were observed were travelling at subsonic speeds and may, therefore have been some sort of known aircraft.

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Incident #18 -- Toronto, Canada -- 20 September 1947

It is stated in the information given here that this incident has been determined to be a hoax.

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Incident #19 -- Dayton, Ohio -- 20 October 1947

Information given here is insufficient to exclude positively the possibility that the objects observed were a close pair of fireballs, but this seems extremely unlikely. Since the length of time in sight is not stated nor the speed estimated, it is impossible to draw any definite conclusions. Assuming these to be appropriate, if one were to stretch the description to its very limits and make allowances for the remarks of an untrained observer, he could say that the "cigar-like shape" might have been an illusion caused by rapid motion and that the bright sunlight might have made both the objects and the trails nearly invisible.

This investigator does not prefer that interpretation, and it should be resorted to only if all other possible explanations fail. In short, while it is not out of the realm of possibility that the objects seen were an unusual double fireball, it is most unlikely.

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Incident #20 -- Xenia, Ohio -- 20 October 1947

The information given here is insufficient to determine any possible astronomical origin of the object observed.

As in incident #19, while it is impossible to rule out the meteoric explanation (e.g., straight course, fast speed), the lack of information about trail, length of time in sight, manner of disappearance, and distance from observer, make any attempt at a definite interpretation rather futile.

Again, in short, it is not impossible that the object seen was a daylight, slow-moving bolide, but it is highly improbable, judging from the limited information offered.

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Incident #21 — Des Moines, Iowa -- 29 June 1947

There is no obvious astronomical explanation for this incident.

If the estimate of size can be given any credence at all, the objects could not have been farther than five miles away; this is an absolute upper limit, and objects probably were very much closer.

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Incident #22 -- Spokane, Washington -- 21 June 1947

This incident does not have any obvious astronomical explanation.

The information given is too limited to suggest any definite interpretation. It would seem, however, that the objects might possibly have been a series of balloons.

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Incident #23 -- Boise, Idaho -- 30 June 1947

It seems exceedingly probable that the object observed in this incident was a combination sun-cloud effect. The altitude of the sun was 30°, azimuth 280°. At that time of the afternoon, the sun's position was such that it could easily have illuminated a background cloud which was perhaps almost entirely covered by a foreground cloud. (Boise weather reports indicate an entirely clear sky, but the report of the incident itself states that the object "seemed to be clinging to a huge cloud.") This investigator himself has observed such effects.

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Incident #24 -- Weiser, Idaho -- 12 June 1947

There is nothing in the description of this incident that is fatal to the hypothesis that the objects observed were parts of a "double fireball," but any such identification must remain uncertain.

The most convincing element favoring the meteoric hypothesis is the persistent train. Fireballs occasionally leave trains that persist for over an hour.

As far as trajectory is concerned, this is in agreement with that to be expected from a meteor on its way out from the sun (it having gone toward the sun several weeks previously and now being on its return journey toward outer space). Such a fireball would be travelling relatively slowly, and could appear to "shoot out from the sun" and to travel in a southeasterly direction.

The absence of bright flare and of noise is not unusual, since reported daylight meteors are frequently not luminous (but do leave a trail), and often no noise is heard.

Nor is the fact that there were two such objects fatal to the hypothesis. The object could easily have been single and have broken in two, either in its journey around the sun or upon entering the earth's atmosphere. There have been several cases of comets that were single on their trip toward the sun and double on the way out. Since comets and meteors are closely related as far as structure is concerned, the double feature is entirely possible.

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The shooting up and down might be dismissed as subjective and illusory, although small bits shooting off from the main meteor could also give this effect.

In spite of all this, this investigator would prefer a terrestrial explanation for the incident.

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Incident #25 -- West Trenton, New Jersey -- 4 July 1947

The object sighted here could easily have been a bright meteor, but in view of the date of the observation, it seems even more likely that the young lady saw part of a late Fourth of July celebration -- a rocket from some amusement park, perhaps.

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Incident #26 -- Harmon Field, Newfoundland -- 10 July 1947

The evidence presented here, and in incident #27, 27a, which refers to the same object, favors the hypothesis that the trail of a fireball was seen. The photographs submitted show a typical fireball trail. The "feathered edges" left on a cloud which the object broke through could easily have been caused by a fireball.

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Incident #27, 27a -- Harmon Field, Newfoundland -- 10 July 1947

Evidence presented here favors the hypothesis that the trail of a fireball was seen by observers. For details see report on incident #26.

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Incident #28 -- Idaho -- 24 June 1947

Any probable astronomical explanation for this incident is dependent upon the hour of observation, which is not stated in the information given with the summary.

An unconfirmed statement (by Mr. Markham, quoted in material submitted relative to Incident #101) that the observation was made at 3:30 P. M. allows for no possible astronomical explanation other than that a persistent meteor train may have been observed. Such a phenomenon might have given the general impression suggested by the limited description of the incident.

If, however, the observation occurred during the early evening hours, shortly after sunset, which occurred that day at about 8:00 P. M. local time, then it is extremely likely that Lt. Gov. Whitehead saw either the planet Saturn or Mercury. Mercury set almost exactly an hour after the sun and was of stellar magnitude +1. Saturn, of magnitude +0.6 and hence about once again as bright as Mercury, set two hours after the sun. A bright planet shining through thin cirrus clouds could give the impression of a "comet-like object."

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Incident #28 -- Portland, Oregon -- 14 June 1947

There is nothing whatever in this incident to suggest that the objects observed were of astronomical origin. Their maneuvers and the relatively long time they were in sight definitely preclude any possible astronomical interpretation.

It is of interest to note that in this locality and at this season other possibly-similar, non-astronomical incidents were reported -- e.g., #17 and #68.

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Incident #30, a-c -- Lockbourne AAB, Columbus, Ohio -- 7 January 1948

Considering this incident with #32, 33, and 48, one is forced to conclude that the object observed from Lockbourne Army Air Base on the evening of 7 January 1948 was the planet Venus.

One report of the incident gives the location of the object as ESE-120°, or approximately opposite from that stated by other observers and that of Venus. Obviously, since the time of observation was the same, this means that one witness either was looking at a different object or had his directions mixed. Since the description otherwise agrees generally with the rest, and since it is assumed throughout the reports that all observers were viewing the same object, the latter interpretation seems preferable.

Witnesses state that the object "couldn't have been a star" (of course, it wasn't), because the sky was completely overcast. However, reports from the Columbus weather bureau indicate that, although the afternoon was cloudy, the sky was clear by 1900 hours. (This does not mean, of course, that there were no clouds near the western horizon.)

For possible explanations of the "tactics" reported by observers of this object, and further discussion of the incident, see report on #33.

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Incident #31 -- northern Arizona -- mid-December 1946

The trail seen here was almost certainly that of a slow-moving fireball. In daylight quite frequently the primary thing observed in such cases is a white smoke trail.

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Incident #32 -- over Columbus, Ohio -- 7 January 1948

The evidence given in this incident fits the hypothesis that the object observed was the planet Venus, and, considered with incidents #30, 33, and 48, it is incredible that it could have been anything else.

See report on #33 for detailed discussion of sightings of 7 January 1948.

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Incident #33, a--; -- Godman Field, Fort Knox, Kentucky -- 7 January 1948
a discussion of all incidents reported for this date

Incidents #30, 32, 33, and 43 all occurred on 7 January 1948, with #33 involving the death of Lieutenant Mantell. Detailed attention has therefore been given to any possible astronomical body or phenomenon which might serve to identify the object or objects concerned. The four incidents are considered together here.

Although the several reports differ considerably in regard to the bearing and motion of the object (assuming for the moment that the afternoon and evening sightings refer to the same phenomenon), they are generally consistent concerning the time, manner, and place of its disappearance over the horizon. Hour and azimuth are given as 1903 CST, about 250°, by observers at Godman Field; 1955 EST, west southwest, by those at Lockbourne Air Base; and 1955-2000 EST, about 210°, by those at Clinton County Air Base; (there are, as is to be expected, slight differences in individual reports). Using this for the focal point of attack, one notes immediately that all these times and bearings agree closely with the time and place of the setting of Venus. Furthermore, all accounts except one agree that the object was low in the southwest before the time of disappearance. Reports vary as to details of its motion, but the overall motion was southwest and then over the horizon. These facts taken together preclude any question of coincidence. Furthermore, simultaneous observation from scattered locations proves that the object had negligible parallax, or, in short, that it was a very great distance away. All other statements concerning the object must,

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it seems to this investigator, be weighed in terms of the overwhelming evidence of the manner of disappearance over the horizon.

The stellar magnitude of Venus on January 7 was -3.4, which makes it 30 times brighter than the bright star Arcturus. Venus, when as bright as this and shining through interstices in a host of clouds, could very easily give the effect of a flaming object with a tail. Concerning the erratic motion reported by some witnesses, this can be said: motion of clouds past the object could give the illusion of rapid movement, as when clouds scud by the moon; or the effect could have been a psychological illusion; a third possibility, remote but based on a rarely-observed phenomenon, is that, owing to thermo-inversions in the atmosphere, stars near the horizon have been known to jump about erratically through arcs of two or three times the moon's apparent diameter. Venus, when very close to the horizon, has been known to twinkle brilliantly with rapidly changing colors.

It appears to the present investigator, in summing up the evidence presented, that we are forced to the conclusion that the object observed in the early evening hours of January 7, 1943, at these widely separated localities, was the planet Venus. To assume that a terrestrial object could be located so high as to be visible simultaneously over a wide area, could be of such intrinsic brightness (of incredible brightness, far surpassing any known man-made light), and would be placed essentially at the very position of Venus in the sky over an

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interval of more than half an hour, would be incredible.

Incident #33 is the only one of the four that includes the daytime observation of presumably this same object. The importance of the incident is, however, paramount, for it was in tracking down the mysterious object that Lieutenant Mantell lost his life. Again it is possible that the object observed was the planet Venus, although the evidence is by no means as definitive as that for the sightings made later that day. First, the bearings of the object as reported by various witnesses differ considerably; where one says southwest, another says south, for the same instant. However, integrating all the evidence, one is again struck with the coincidence of the object's position with that of Venus. The following short table of sightings vs the positon of Venus shows the general agreement of the two in azimuth:

CST	Object	Venus
1330 (PFC Oliver)	SW of field	Almost due S; 1.4°
1345 (Sgt. Blackwell)	South of field	1.8°
(PFC Oliver)	SW	
after 1400 (Lt. Orner)	SW	from due S (180°) at 1400, moving westward
1445 (Capt. Mantell)	210°	190°
(Col. Hix)	215°	

A more pertinent question is that of whether it would have been possible to see Venus in the daytime on that day. All that can be said here is that it was not impossible to see the planet under those conditions. It is well known that when Venus is at its greatest brilliancy, it is possible to see it during the daytime when one knows exactly where to look, but on January 7, 1948 Venus was less than half

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as bright as it is when most brilliant. However, under exceptionally good atmospheric conditions and with the eye shielded from the direct rays of the sun, Venus might be seen as an exceedingly tiny bright point of light. It can be shown that it was definitely brighter than the surrounding sky, for on the date in question Venus had a semi-diameter of 8 seconds of arc, or a total apparent surface area of approximately 125 square seconds. Assuming that a square second of sky would be a trifle brighter than the fourth magnitude, a portion of the sky of the same area presented by Venus would be about -2.1 magnitude. Since the planet, however, was -3.4, it was 5 times brighter than an equivalent area of sky. While it is thus physically possible to see Venus at such times, usually its pinpoint character and the large expanse of sky makes its casual detection very unlikely. If, however, a person happens to look toward a point on the sky that is just a few minutes of arc from the position of Venus, he is apt to be startled by this apparition and to wonder why he didn't see it before. The chances, of course, of looking at just the right spot are very few. Once done, however, it is usually fairly easy to relocate the object and to call the attention of others to it. However, atmospheric conditions must be exceptionally good. It is improbable, for example, that Venus would be seen under these circumstances in a large city.

It can be said, therefore, that a possible explanation for the object sighted in the daytime in incident #33, a-g, is that it

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too was the planet Venus. In the absence of exact measures, however, it is impossible to establish that it was or was not. (It is unfortunate that theodolite measures of the afternoon observations were evidently not made.)

It has been unofficially reported that the object was a Navy cosmic ray balloon. If this can be established, it is to be preferred as an explanation. However, if one accepts the assumption that reports from various other locations in the state refer to the same object, any such device must have been a good many miles high -- 25 to 30 -- in order to have been seen clearly, almost simultaneously, from places 175 miles apart.

It is entirely possible, of course, that the first sightings were of some sort of balloon or aircraft, but that when these reports came to Godman Field, a careful scrutiny of the sky revealed Venus, and it could be that Lieutenant Mantell did actually give chase to the planet, even though whatever object had been the source of the excitement elsewhere had disappeared. At the altitudes that the pilot reached, Venus would have been very much more easily observed than from the ground, and it might even be that he did not actually pick it up until he was at a considerable altitude. The one piece of evidence that leads this investigator to believe that at the time of Lieutenant Mantell's death he was actually trying to reach Venus is

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that the object appeared essentially stationary (or moving steadily away from him) and that he could not seem to gain on it.

In summing up, this can be said: the evening sightings reported in incidents #30, 32, 33, and 48 were undoubtedly of the planet Venus. Regarding the daylight sightings from Godman Field and other places in Kentucky, there seems so far to be no single explanation that does not rely greatly on coincidence. If all reports were of a single object, in the knowledge of this investigator no man-made object could have been large enough and far enough away for the approximately simultaneous sightings. It is most unlikely, however, that so many separate persons should at that time have chanced on Venus in the daylight sky. It seems, therefore, much more probable that more than one object was involved: the sightings might have included two or more balloons (or aircraft); or they might have included both Venus (in the fatal chase) and balloons. For reasons given above, the latter explanation seems more likely. Such a hypothesis does, however, still necessitate the inclusion of at least two objects other than Venus, and it certainly is coincidental that so many people would have chosen this one day to be confused (to the extent of reporting the matter) by normal airborne objects. There remains one possible, very plausible explanation for this fact, however: was the original report by any chance broadcast by local radio stations? If so, with the general public on the alert, even

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the commonest aircraft might suddenly have appeared to be strange celestial objects.

In any event, since it seems possible that at the time of Lieutenant Mantell's death, he was actually giving chase to Venus (and since, certainly, during the evening sightings, persons assumedly well acquainted with objects of the sky were alarmed by the appearance of the planet), it might be wise to give information about this incident wide circulation among air force personnel, so that tragic mistakes will not occur in the future.

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Incident #34, 34a-f -- Manitoba, Canada -- 13 October 1947

The reports of this incident answer to the description of a typical large meteor, or fireball. The trajectory, speed, color, and explosion are particularly convincing evidence.

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Incident #35 -- off coast of Oregon -- 12 November 1947

The information given here is too meager for a definite conclusion to be drawn concerning the identity of the objects observed. It is probable, however, that they were two parts of a meteor that had broken upon entrance into the earth's atmosphere. The length of time in sight is unduly great, but one wonders whether this might not have been grossly overestimated for psychological reasons. Otherwise, the scanty description favors the meteoric hypothesis.

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Incident #33 -- Boise, Idaho -- date unknown (probably November 1947)

Very little can be said of this incident, inasmuch as the date and exact time of observation, speed, altitude and size of object, and length of time in sight are not stated. The speed and time in sight are particularly important in forming a judgment. In the absence of this information, the most that can be said is that the object might have been a fireball.

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Incident #37 -- Phoenix, Arizona -- 14 October 1947

There is clearly nothing astronomical about this incident, and the information given here does not suggest any other explanation.

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Incident #38 -- Hungary -- around 10 June 1947

It is extremely unlikely that the objects observed in Hungary were meteorites, unless the meager description given here is quite inaccurate. Without knowledge of the speed and trajectory of the objects, nothing definite can be said.

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Incident #39 -- Grand Falls, Newfoundland -- 9 July 1947

It is extremely unlikely that these objects were meteors, although their speed would argue for such interpretation. Had they been, however, one would expect much more brilliant light, a trail, and perhaps even detonation. Furthermore, their flight in formation argues against their being meteoric.

The meager description suggests a light phenomenon rather than material objects. Was any auroral activity reported in the region at the time? The description answers more closely to a detached auroral streamer than to anything else, but this explanation is perhaps also far fetched.

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Incident #40 — Phoenix, Arizona — 7 July 1947

No astronomical explanation seems possible for the unusual object cited in this incident.

This case is especially important because of the photographic evidence and because of the similarity of these photographs to the drawings by Kenneth Arnold (incident #17). The two incidents are separated by slightly more than two weeks, and, of course, they occurred in different localities. It is, however, perhaps more than coincidence that these two best-attested, entirely independent cases should agree so closely concerning the shape of the object and its maneuverability.

The present investigator would like to suggest that this incident, #40, being one of the most crucial in the history of these objects, be reopened for investigation. The actual camera used by Mr. Rhodes should be examined, and the original negatives preserved. Since, from the size of the image on the photograph, we can have an accurate estimate of the angle subtended by the object, this in connection with what appears to be a fairly reliable estimate of the distance, can give us an estimate of the forces and accelerations involved in the trajectory described by Mr. Rhodes. (It is unfortunate that a competent investigator was not dispatched at once to "reenact the crime" with Mr. Rhodes and to obtain sketches of the trajectory, etc., before details faded from his memory.) It would be important to know at what

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altitude and azimuth Mr. Rhodes' camera was pointed at the time of his two exposures and the approximate time interval between exposures. Physical data like these are absolutely essential if we are to get anywhere in any basic physical explanation of these incidents.

There remains the strong possibility that the entire incident is spurious, and the invention of an excitable mind. This strengthens the need for reinvestigation; if spurious, this fact should be highlighted and even publicized, to quench enthusiasm for the irresponsible reporting of "saucers" and like objects.

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Incident #41 -- Anchorage, Alaska -- 11 July 1947

No astronomical explanation can be given for this incident. The object apparently was a balloon, although the meager data given does not allow a definite conclusion.

[redacted]

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Incident #41 -- Anchorage, Alaska -- 11 July 1947

No astronomical explanation can be given for this incident.

The object apparently was a balloon, although the meager data given does not allow a definite conclusion.

[redacted]

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Incident #42 -- Anchorage, Alaska -- 12 July 1947

As in incident #41, no astronomical explanation can be given here.

In this incident also, the temptation is to assume that the object seen was a balloon.

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Incident #43 -- Clarion, Iowa -- 29 June 1947

This incident refers to the same sighting by the same observer as that summarized in incident #21. See that report for conclusions.

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Incident #44 -- near Milwaukee, Wisconsin -- 28 June 1947

Information given here is insufficient to indicate what was seen. If this were a totally independent observation and not one that was presumably incited by current radio reports of flying saucers, more weight could be given to it. As it is, with flying saucer talk rampant, almost anything from meteors to balloons or aircraft would be reported as saucers by an uncritical observer. It is unlikely, however, that there was anything astronomical about this incident.

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Incident #45 -- Illinois -- 28 June 1947

See statement concerning incident #44.

Information is entirely insufficent to determine whether anything of an astronomical nature was observed.

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Incident #45 -- Illinois -- 28 June 1947

See statement concerning incident #44.

Information is entirely insufficient to determine whether anything of an astronomical nature was observed.

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Incident #43 -- Greenfield, Massachusetts -- 22 June 1947

This incident does not admit of a ready astronomical explanation. The absence of a trail does not favor the meteoric hypothesis, although the speed and brilliance of the object might.

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Incident #47 -- Fairfield-Suisun Air Base, California -- 3 July 1947

This incident cannot be readily explained astronomically. The object was in sight too long to be a meteor, and the variable "reflection" and absence of any statement about trail also argue against that interpretation. It is difficult, however, to rule out the hypothesis completely, because of the lack of pertinent information and the ever-present possibility that the reporting was more subjective than objective.

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Incident #43 -- Clinton County Air Field, Ohio -- 7 January 1948

This incident must be considered with #30, 32, and 33. Combined evidence shows that the object observed from Clinton County Air Field on the evening of 7 January 1948 was undoubtedly the planet Venus.

For discussion of erratic motion related by the observers of the object, and other details, see report on incident #33.

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Incident #49 -- Danville, Kentucky -- 9 January 1948

Although the distance, time in sight, speed, sound, size, color, and construction of the object reported here are not stated, the fact that it showed a long trail and exploded makes it entirely probable that it was a fireball.

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Incident 449 -- Danville, Kentucky -- 9 January 1948

Although the distance, time in sight, speed, sound, size, color, and construction of the object reported here are not stated, the fact that it showed a long trail and exploded makes it entirely probable that it was a fireball.

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Incident #50, 50a -- Wildwood, New Jersey -- 10 January 1948

In view of the unbalanced character of at least one of the observers (as indicated by the report of the interview), this investigator wonders how much credence can be given to the reports of the object or objects cited. For instance, the summary states that the first object was in sight 5-8 seconds, while the interview indicates 15-20 minutes. Assuming that this first incident was authentic and the shorter time correct (it evidently being the estimate given by the second observer), there is nothing in the evidence that is contradictory to the notion that the object observed was nothing more than a slow-moving fireball. The color, splitting into two pieces, and manner of disappearance all support this view.

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Incident #61 -- Oswego, Oregon -- 3 September 1947

The limited information given here does not suggest anything astronomical.

It is surprising that there was only one witness to this incident, since it occurred in a city, at a time when there was a plane in the sky.

If these objects were not ordinary aircraft at a great distance, or a cluster of balloons, then the incident must be considered together with others reporting groups of unidentified round or discoid objects, several of which occurred in this locality (e.g., incidents #6-9, 12-16).

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Incident was a -- Hamilton Field, California -- 29 July 1947

The objects observed here were almost certainly not astronomical, although their speed, shape, and manner of disappearance might tend to the fireball hypothesis. The lack of trail and the "tactics" pursued by the second object make the likelihood of that interpretation very slight; however, the possibility cannot be entirely ruled out if considerable allowance is made for looseness in reporting.

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Incident #53 -- near Lake Meade, Nevada -- 28 June 1947

There appears to be nothing astronomical about this incident.

According to the observer, the objects had a speed of 285 MPH and were moving on a course of 120°. Now, since the plane was moving at 285 MPH on a course of 300°, it is possible that the observed motion of the objects was only apparent (since 180° plus 120° equal 300°), and we can conjecture that a cluster of balloons (cosmic ray apparatus perhaps) was observed, the motion of which was merely a reflection of the motion of the plane.

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Incident #54 -- between Dutch coast & Norfolk, England -- 16 Jan. 1947

The object observed here was obviously not astronomical. From the information given, it appears that this was definitely an aircraft.

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Incident #55 -- Harmon Field, Newfoundland -- 25 July 1947

If proper allowance is made for the reporting of untrained observers, it is possible that the objects observed in this incident were a minor meteor shower. The "reddish flashes of light" and "abrupt darts" would tend to this interpretation. The hypothesis hinges, however, on the statement that "a number of intermittent flashes were observed for three minutes." If this means independent flashes, it lends support to the meteoric interpretation. If it means that the same objects flashed intermittently for three minutes, that theory is ruled out. It seems more probable in view of the statement about "abrupt darts of light" that the former meaning is correct.

There is somewhat more evidence in this incident than in #57 (which is similar, and occurred just three days earlier) favoring meteors, but probably the events of these two incidents are related, and it is very unlikely that meteors could explain both of them.

According to the report of the U. S. Weather Bureau on ball lightning, it would appear that this phenomenon sometimes takes the form of luminous darts and can be red. Perhaps this could offer an alternate explanation for the incident.

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Incident #33 -- Birmingham, Alabama -- 6 July 1947

This incident has no obvious astronomical explanation.

The photograph purported to be a part of the report of the incident is not documented. There is no proof in the evidence at hand that it shows the objects described. From the word description alone, which is quite limited, the objects could be explained simply as rockets: "vertical ascent," "travelled in arc." Data is too meager for a definite conclusion, however.

If the photograph is authentic, it would be extremely valuable to know the shutter speed at which it was taken, since from this the angular velocity could be determined.

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Incident #57 -- between Nova Scotia and Newfoundland -- 20 July 1947

This incident and #58, which occurred in the same vicinity just three days apart, do not fit into the usual description pattern. In both cases, information given is meager, and in both cases the meteoric hypothesis cannot be completely ruled out, but the objects could have been rockets or even freak auroral streamers or brush discharge from ionized dust clouds. In any event, it seems unlikely, although it is not impossible, that the objects seen in this incident were meteors. The even spacing of the flashes argues strongly against the meteoric hypothesis.

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Incident #68 — NW of Bethel, Alaska — 4 August 1947

There is no astronomical explanation for this incident. The time in sight (four minutes) and rate of speed (520 MPH) seem to preclude any such possibilities.

The similarity of this incident to #10, in which several objects were seen silhouetted against a sunset, is striking.

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Incident #59 -- beyond Becker Island -- 12 September 1947

From the evidence at hand, it appears quite likely that the object observed was a fireball. Fireballs have been known to change course abruptly when splitting. The reported change to reddish hue from the previous color of incandescent light, the length of time in sight, and the manner of disappearance all lend support to this hypothesis. At sunset one can expect relatively slow-moving, nearly horizontal fireballs.

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Incident #60, a, b -- Cordroy, Newfoundland -- 10 July 1947

The descriptions given by the three observers of this object answer quite closely to that of a typical bright, "slow-moving," bolide. It is extremely likely that the object sighted here was nothing more than a fireball.

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Incident #61, 61a -- Logan, Utah -- 8 September 1947

This incident, and incident #62, which clearly refer to the same objects (witnesses were together at the time of observation) do not have an astronomical explanation.

Since it was dark, any judgment of distance can be greatly misleading, and extremely fast motion might be ascribed to closeness rather than to true linear distance.

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Incident #62 -- Logan, Utah -- 8 September 1947

This incident does not have an astronomical explanation.

See report on incident #61.

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Incident #83 -- NE of Helena, Montana -- 29 July 1947

With the exception of the color ("like polished nickel") and the lack of statement concerning a trail, the object reported in this incident might very well have been a daylight meteor. Bright meteors have been observed to move in wavy paths. The manner of disappearance ("melted into thin air") further supports this view. Time in sight and speed also check. In short, it is more likely that this object was a bright meteor than that it was anything else.

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Incident #64 -- Twin Falls, Idaho -- 19 August 1947

There is nothing astronomical in this incident.

The reported overcast sky could have made it possible for signal or search lights to be reflected from the cloud background.

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Incident #do -- Rehoboth Beach, Delaware -- September 194[illegible]
October 194[illegible]
2 June 1947

This incident contains nothing astronomical.

It is entirely possible that the objects observed on these three separate dates were "Bumble Bees," ram-jet missiles, as fired from Fort Miles by the Applied Physics Laboratory of Johns Hopkins University. Since the hour of observation of the various sightings (and the exact day of the first two) is not given in material submitted to this investigator, positive identification cannot to made; but if these facts are known, inquiry at the above-mentioned laboratory (address: 8621 South Georgia Avenue, Silver Spring, Maryland) might bring forth definite identification.

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Incident #66 -- Silver Springs, Ohio -- 7 August 1947

From all evidence, it appears that the object seen here was a bright meteor. Slow-moving meteors occur before midnight, and, while their paths are almost never "absolutely horizontal," it is quite possible that the observer could have gained this impression, since the object was in sight for only three or four seconds. Furthermore, an observer, surprised by an unusual occurrence, often tends to overestimate the actual duration of time; thus, "three or four seconds" might mean not much more than a second.

There is nothing at all in the evidence that cannot be explained under the assumption that the object was a meteor.

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Incident #67 -- near Placerville, California -- 14 August 1947

If details of the observers' statement are accurate, it would be difficult to assign an astronomical origin to the object seen in this incident. There are a few statements which, taken alone, strongly suggest that a meteor was observed: high rate of speed, "seemed to be in a shallow dive," white smoke trail, "disappeared in a puff of dark gray smoke." However, unless the description of the object (4-6 feet long and 10-14 inches wide) and the estimated distance (less than 1000 feet) are illusory, the meteoric explanation will not hold.

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Incident #69, 69a -- Philadelphia, Pennsylvania -- 6 August 1947

The reports of this incident and those of #70 refer to the same object and are typical of descriptions of relatively slow moving meteors. The speed, trail, hissing sound (after passage -- although this could easily have been a subjective reaction) and color all check with the object's having been a fireball, bolide, or large meteor.

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Incident #68 -- Portland, Oregon -- 24 June 1947

There is no astronomical explanation for this incident, which should be considered together with the Kenneth Arnold case (#17), which occurred on the same day, and in which similar discoid objects were observed. (The present objects appeared to have tails, however; another major difference between this and the Arnold incident is the inferred size of the objects, as determined from the estimated distance.)

It is difficult to take seriously the peculiar action of the compass, for this would imply fantastically large magnetic fields.

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Incident #70, 70a -- Philadelphia, Pennsylvania -- 6 August 1947

The descriptions given of this object are typical of those of relatively slow moving meteors. See report on incident #69 for details.

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Incident #71 -- Las Vegas, Nevada -- 8 or 9 October 1947
(Supercedes interim report of 2/1./49)

In everything except the course flown, the description given here answers to that of a fireball. The course indicated in this incident, however, appears almost fatal to such a hypothesis. No fireball on record, to this investigator's knowledge, has been known to turn back on itself. Daytime fireballs have been observed, however, that were invisible save for a marked white cloudlike trail.

Most fireballs pursue essentially straight courses, and, in fact, apparent deviations are often caused by illusions of perspective and of a spherical sky. Real deviations are caused by effects of the meteor's encounter with the atmosphere. To execute a curved trajectory would require highly extraordinary circumstances indeed, and a meteoric explanation for this incident must be regarded as most improbable.

It is more likely that some sort of aircraft was under observation.

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Incident #72 -- Alaska -- 1947 (exact date not known)

From the scanty information available, it appears improbable that this object was astronomical, unless the report represents a highly garbled and subjective account of a daylight meteor. (The time of the sighting is not given, but it is assumed from the description of the incident that it occurred during daylight hours.)

It should be noted as a matter of general record that some of the reports received at observatories of recognized fireball falls are so highly colored and garbled that if the astronomers did not have independent evidence of the identity of the object, it would be impossible to determine from these reports.

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Incident #75 -- near Twin Falls, Idaho -- 13 August 1947

There is clearly nothing astronomical in this incident. Apparently it must be classed with the other bona fide disc sightings.

Two points stand out, however: the "sky blue" color, and the fact that the trees "spun around on top as if they were in a vacuum." Could this, then, have been a rapidly travelling atmospheric eddy?

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Incident #74 -- cancelled -- see #68

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Incident #76 -- Salmon Dam, Idaho -- 13 August 1947

There does not appear to be anything astronomical about this incident.

Although sighted on the same day as the sky-blue canyon saucer (incident #75), the objects described here seem to have little or no similarity to the former.

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Incident #75 -- Boston, Massachusetts -- 4 August 1947

There is nothing in the evidence given here to suggest that the object sighted was astronomical.

The description suggests rather that the object may have been a highly distorted reflection image of the sun on a balloon or aircraft. The "deep gold" color ascribed to the object tends to indicate this interpretation.

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Incident #77 -- South Brooksville, Maine -- 3 July 1947

There is nothing to suggest an astronomical origin of the objects cited in this unusually well-reported incident. Inasmuch as the sightings were made by an "astronomer" (although this investigator has never heard of him), one can presume that any astronomical implications would have been noted. The observer's question "Have any meteorites been reported?" is puzzling, because he should have been able to rule out that possibility himself. The estimated speed is all that would suggest meteors, and the absence of smoke trails and the general tenor of the description seems to rule out the objects' having been daylight meteors.

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Incident #78 -- Grand Canyon, Arizona -- 30 June 1947

While it seems more probable that the objects sighted in this incident were freely-falling, man-made instruments, perhaps from oursted instrument balloons, the possibility of their being freely-falling meteorites is not completely ruled out. When the mass of an in-coming meteorite is of the proper order of magnitude, the meteor can come in on a non-vertical path, become a bright bolide, or fireball, and have its horizontal speed component reduced essentially to zero. It then falls to earth as a non-luminous, freely-falling body.

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Incident #80 -- Arlington, Virginia -- 7 July 1947

There is nothing in the description of this incident that contradicts an explanation of the object as a slow-moving, bright meteor. Slow-moving meteors are generally observed before midnight.

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Incident #79 -- Richmond, Virginia -- April 1947

There is no astronomical explanation for this incident, which, nowever, deserves considerable attention, because of tne experience of the observers and tho fact that the observation was made through a theodolite and that comparison could be made with a pibal balloon. The observers had, therefore, a good estimate of altitude, of relative size, and of speed -- much more reliable than those given in most reports.

This investigator would like to recommend that these and other pibal observers be quizzed as to other possible, unreported sightings.

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Incident #82 -- Oklahoma City, Oklahoma -- between 17-21 May 1947

At first glance it does not appear that this incident has an astronomical explanation, but there are several portions of the description that can fit into such a picture, particularly if allowance is made for subjective reporting. The speed and manner of flight tally with that to be expected from an early-evening bolide. The observer states that the object was "round out disclike" and then again says that it was ten times longer than thick. It appears to this investigator that this sort of impression could be given by a bolide, the persistence of vision accounting for the reported elongated appearance.

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Incident #81 -- Hickam Field -- 7 July 1947

Clearly there is nothing astronomical in this incident.

It would appear that the object sighted was an instrument-carrying balloon.

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Incident #83 -- between Boise & Meridian, Idaho -- 9 July 1947

There appears to be a time discrepancy in this incident: the summary report states that the object was in view 10 to 30 seconds, yet indicates that the observer had time to call a weather station to inquire about balloon releases, and also to expose 10 seconds of 8 mm. film.

In any event, however, besides the fact that no smoke trail was indicated, tactics of the object preclude the possibility of its having been astronomical; meteors do not execute "slow rolls" or climb upward.

A better estimate of speed is needed. The possibility remains that the object may have been an unsymmetrically-painted balloon.

[redacted]

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[redacted]

Incident #84 -- near Lakeland, Florida -- 7 July 1947

There appears to be no astronomical explanation for this incident: upward trajectory and "plastic appearance," if accurately reported, do not lend themselves to such an explanation. No trail is mentioned.

[redacted]

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Incident #85 -- cancelled -- see #29

[redacted]

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[redacted]

Incident #86 — Hollywood, California — 6 July 1947

From the limited data available, there appears to be no astronomical explanation for this incident.

Rolling motion and saucer shape relate the incident to many others, which, however, did not exhibit the ray phenomenon.

[redacted]

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Incident #87 -- Germany -- date not given

As this incident is reported, it is very unlikely that any astronomical interpretation can be offered. The description is probably of a low order of reliability, however, and it is not beyond reason that a spiral smoke trail ("first thought it was a cloud") from a meteor was observed. Unfortunately, no definite conclusion can be drawn.

[redacted]

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Incident #33 -- Hackensack, New Jersey -- 3 August 1947

It seems clear that no astronomical interpretation can be given to this incident.

Information is so meager that little else can be said. If the object observed was only 200 yards away, it would seem that witnesses could have furnished much more detailed information.

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Incident #89 -- 100 mi. N of Kansas City, Missouri -- 6 July 1947

There is no direct astronomical explanation for this incident.

The striking feature of the incident is that the "very bright" object travelled in the same direction and at the same speed as the observer did, and that it appeared at 11 o'clock position at his left, or approximately opposite to the position of the sun at the time.

It cannot be proved, of course, but it is probable that the witness saw a direct reflection of the sun on some continuous object -- thin clouds, ice crystals, or the like. (Had the object appeared on his right, then this explanation would be untenable.) Its disappearance can be explained logically also, for turning altered the observer's angular relationship to the reflector.

It is further noted that an apparent inconsistency exists in the report. The observer first stated that the object appeared to be the top of a water tank "low and to his left"; after checking his position he stated that the object was at 11,000 feet. The inconsistency in altitude throws some suspicion on the observation. If the object was low, then a running reflection along a river or railroad track would be a promising explanation.

[redacted]

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Incident #90 -- between Las Cruces, New Mexico & White Sands V-2 firing grounds -- 29 June 1947

The information given here is insufficient for any definite conclusion to be drawn, but it is not impossible that the object observed was meteoric. The estimated time in sight is quite long, however, and, if a meteor, the object should have had a pronounced vapor trail. The "solar specular reflection which seemed to change in intensity" could, of course, have been light from the meteor itself, blended with daylight.

Once again, it is unfortunate that more detailed observations were not made.

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[redacted]

Incident #92 -- Manitou Springs, Colorado -- 19 May 1947

There is no astronomical explanation for this incident; the reversal of direction of flight and the manouvers executed by the object preclude this.

The speed is not stated with any exactness, but if it was not too great, the object might have been a balloon, or aircraft seen under unusual conditions. Otherwise, there appears to be no plausible explanation.

[redacted]

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Incident #91 -- Montgomery, Alabama -- 28 June 1947

No astronomical object could possibly behave in the manner described in this incident.

A small lighted balloon at the mercy of changeable winds aloft might offer a possible explanation.

(The stated position of the moon at the time has been checked and found to be correct.)

[redacted]

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Incident #93 -- Hartford, Connecticut -- 11 January 1943

Despite the absence of a trail and of sound, identification of this object as a fireball at the very end of its trajectory seems possible. It is described as "shooting toward earth at 45°," as resembling a "shooting star," and as having a very high velocity.

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Incident #94 -- 42° 9.3' N, 114° 22.2' W -- 30 December 1947

This incident and incidents #95, 96, and 97, which describe the same object, clearly refer to a thoroughly authenticated fireball. These sightings can be dismissed with finality by the following quotation from Popular Astronomy, October, 1948:

Fireball of 1947 -- Dec. 30
Nancy G. Weber

> On this date at 7:30 P. M. PST a brilliant fireball appeared travelling westward over southern Oregon. ... Prof. J. Hugh Pruett gathered numerous reports from observers in Oregon, California, and Nevada, and from these made an appropriate solution for the path. He sent both his solution and all the 47 reports to the Flower Observatory where another solution was independently made. Ours agreed closely in all respects with that of Pruett except for the heights.
>
> . . .
>
> The meteor was most generally reported to be bluish-green in color. It appeared to explode twice, lighting up the countryside to close observers.
>
> The sound phenomena were limited to 6 out of the 47 observers.
>
> . . .
>
> From the height at which the meteor exploded it is doubtful whether any fragments reached the ground.

It is clear from the general agreement with this of evidence given in incidents #94-97 inclusive that this fireball was the object being described.

[redacted]

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Incident #95 -- Rosedale, California -- 30 December 1947

The description given here refers to an authenticated fireball. See report on incident #94 for details.

It is likely that the fire observed on the ground by viewers of this incident had no connection with the fireball, but it is not out of the question that a fragment of the bolide did land and cause a brush fire.

[redacted]

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Incident #96 -- near Lovelock, Nevada -- 30 December 1947

The explosion seen in this incident was undoubtedly that of the fireball discussed in detail in the report on incident #94.

[redacted]
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[redacted]

Incident #97 -- between Medford, Ore., and Mt. Shasta, Calif. -- 30 Dec. 1947

The flash or explosion referred to here agrees also in time and location (no other details are given) with that of the fireball described in detail in the report on incident #94.

[redacted]

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Incident #98 -- Houston, Texas -- 2 November 1947

The information given here indicates strongly that the object observed was a fireball. There is nothing to suggest that it was not. As far as "falling into a nearby field" is concerned, that is perhaps the best-attested illusion with respect to these phenomena. Very frequently a fireball is reported to have fallen in a "nearby field" all along its track across two or three states.

[redacted]

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[redacted]

Incident #99 -- Finland -- 3 January 1948

Information given here is insufficient to establish even vague identification.

The object seen could have been a fireball, although the length of time of observation seems unduly long. Perhaps this is subject to considerable error?

[redacted]

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[redacted]

Incident #100 -- Finland -- 5 January 1948

Information given here is insufficient to establish any sort of identification. There is nothing in the scanty report of the incident, however, that could not be explained as a meteoric phenomenon.

[redacted]

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Incident #101 — Norcatur, Kansas — 18 February 1948

This now-celebrated case of an unusual fireball has been adequately reported in astronomical literature; (for details, see Sky and Telescope, April, 1948, page 164, and October, 1948, page 293). Positive identification has been made by the recovery of fragments. The origin of this object is, therefore, definitely astronomical, and the incident need not be considered further.

[redacted]

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Incident #102 -- air near Green River, Utah -- 18 February 1948

It seems entirely probable that the object observed in this incident and in #103 was the Moracatur meteorite seen at an earlier part of its trajectory.

The direction of flight is stated as "southeast of Limon, Colorado." If this means that the object was heading southeast from Limon, it could not have been the Moractur fireball, since the direction of flight of that object was northeast; but if the statement merely means that the object was seen in the vicinity southeast of Limon, the location is consistent with the trajectory of that famous meteorite.

The time stated is approximate, and need not be given too much concern. Actually, of course, the sightings here would have had to be made almost simultaneously with those in Kansas. If the time had been reported as 1600 EST instead of 1500 (a typographical error, by any possibility?), then, allowing for the difference of one hour in time zones, the sightings would have been appropriately simultaneous.

In any event, whether this was the same or another object is not important. The description given -- particularly the statement "huge, multicolored ball of fire and dense cloud of smoke" -- answers closely to that of a fireball.

[redacted]

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Incident #103 -- air near Green River, Utah -- 18 February 1948

It seems probable that the object observed here was the Moractur meteorite seen at an earlier part of its trajectory. See report on incident #102 for discussion.

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Incident #104 -- Smyrna, Tennessee -- 7 March 1948

The object sighted here was undoubtedly the planet Venus. The stated position checks exactly (within allowable observational error) with the computed position of Venus. Description of color, speed, and setting time also all check closely.

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Incident #105 -- Belmont, North Carolina -- 8 March 1948

The speed of 600 MPH, the lack of an exhaust trail, and the reported "exactly horizontal course" make it extremely improbable that the object seen in this incident was a meteor. The "steady reflection which did not flicker" also argues against that possibility. Since the observer was a technical man, it does not seem likely that his observations can be considered subjective enough to fit them into an astronomical hypothesis.

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Incident #106-- Bakersfield, California -- 5 March 1948

While this report taken alone, with allowances made for subjective reporting, could be considered as applying to a disintegrating meteorite, the occurrence of at least three very similar incidents (see # 107, 108, 109) at the same location, over a time interval of a few days, is sufficient to make this hypothesis completely untenable.

The description applies more closely to the "star shell" (a projectile which after disintegration emits a parachute to bring instruments safely to the ground), with which this investigator was familiar during the war, than to anything else.

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Incident #107 -- Bakersfield, California -- 8 March 1948

It is very unlikely that the objects observed here were of astronomical origin. See report on incident #106.

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Incident #109 -- Bakersfield, California -- 9 March 1948

It is extremely unlikely that the object cited in this incident was of astronomical origin. See report on incident #106.

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Incident #108-- Bakersfield, California -- 8 March 1948

It is extremely unlikely that this object was of astronomical origin. See report on incident #106.

Although the hour of observation is not stated in the witness's report of incident #107, it is possible, judging by the information which is given, that #107 and #108 refer to the same object or objects.

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Incident #110 -- Baltimore, Maryland -- 23 March 1948

There appears to be nothing whatever astronomical about this incident, and, in view of the limited nature of the information given, nothing further can be said.

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Incident #111 -- Philippine Islands -- 1 April 1948

There appears to be nothing astronomical in this incident.

At a distance of 3 miles an object 20 feet long would subtend an angle of slightly more than 4 minutes of arc, and hence would be very near to the limit of the resolution of the eye. The object must have been very much larger, if the distance is correct, for the observer to discern its shape and its turtle back.

Since the object was seen by only one person, and since the description is contradictory, it seems to this investigator that not much weight can be given to the incident.

[redacted]

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Incident #112,a-f -- Ashley and Delaware, Ohio -- 8 April 1948
(Supercedes interim report of 2/16/49)

From the descriptions given by the various observers -- notably that the object seen appeared like a clearly-outlined cloud, was fleecy white, moved slowly and maintained shape, was a long vertical cylinder -- one can surmise that there is a strong possibility that the object was nothing more than a short, vertical, daytime meteor trail. These trails are known to persist for half an hour or more, and to drift with prevailing winds aloft. The fact that one observer stated that at first the cylinder resembled sky writing is excellent corroboration for the above explanation.

[redacted]

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Incident #113 — Montgomery, Alabama — 9 April 1948

The object cited in this incident answers to the description of an instrument-carrying balloon. In any case, there is nothing whatever in the report which would allow for an astronomical interpretation.

Attention can be called to the similarity of the description given here to that of incident #81.

[redacted]

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Incident #114 -- Fairbanks, Alaska -- 18 April 1948

There is nothing astronomical in this incident.

The description answers that of a maneuvering plane reflecting sunlight. One inconsistency is noted: report states, "Weather clear and visibility unrestricted," whereas weather sequence shows partial cloud coverage. This would not, of course, necessarily have prevented sun reflection from aircraft.

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Incident #115 -- Greenville, South Carolina -- 19 April 1948

There is nothing astronomical in this incident.

The description suggests that the objects observed were balloons or aircraft reflecting sunlight.

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Incident #116 -- Moose Factory, Canada -- 11 March 1948

This incident can certainly be ascribed to the fall of a bright meteor, or fireball.

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Incident #117 -- Memphis, Tennessee -- 7 May 1948

It is unlikely that the objects viewed in this incident were meteors, but the possibility is not excluded.

It is unfortunate that some estimate of distance and of time in sight was not made. Objects might have been quite close, in which case large angular velocity would not imply great speed.

This investigator would like to emphasize again the need for better reporting of such incidents.

[redacted]

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Incident #118 -- Berlin, Germany -- 28 March 1948

The information given here is insufficient for a definite conclusion to be reached; the only possible astronomical explanation, which would be a slow-moving meteor, is very unlikely.

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Incident #119, 119a-b -- Asuncion, Paraguay -- 20 February 1948

While some of the reports of this incident are contradictory, the major portion support the hypothesis that the object observed was a slow-moving meteor or fireball. The speed and color concur in this. The fact that the object was seen over so wide an area implies that the observer who stated that it was only 1000 feet away was in error in his estimate.

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Incident #120 -- Vejle, Denmark -- c. 7 February 1948

Nothing is said here that militates against the object's having been a meteor. Information is very scanty.

[redacted]

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Incident #121 -- Cartersville, Georgia -- 9 January 1948

While the possibility of this object's being a meteor is not ruled out, it seems unlikely. Meteors are not known to be "light sky blue," nor to travel so slowly as indicated. However, report also states that color was an "intense blue," and, if speed were underestimated (or if object had a large radial velocity component -- coming largely "head-on"), it might possibly be interpreted as a fireball.

[redacted]

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Incident #122, a, b -- Holloman Air Force Base -- 6 April 1948 --

At the moment there appears to be no logical explanation for this incident.

There is nothing to indicate an astronomical origin of the object observed.

[redacted]

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Incident #123 -- Alton, Illinois -- 11 April 1948

There is nothing of astronomical character in this incident.

If one considers Colonel Siegmund's statements apart from the considerably less reliable ones of other observers, it would seem that the object may really have been a bird.

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Incident #124 -- North Atlantic -- 18 April 1948

On the basis of the information given about this radar sighting, no astronomical explanation of the incident is at all likely. Could the sighting possibly refer to a flock of migrating birds?

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Incident #125 -- St. Louis, Missouri -- 2 May 1948

Information given here is inadequate to establish any category. The object observed was apparently nothing of an astronomical character.

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Incident #126 -- Anacostia, Naval Air Station -- 30 April 1948

There is nothing in the description of this incident to indicate astronomical origin of the object observed. It appears to have been a balloon.

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Incident #126 -- Anacostia, Naval Air Station -- 30 April 1948

There is nothing in the description of this incident to indicate astronomical origin of the object observed. It appears to have been a balloon.

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[redacted]

Incident #127 -- Yugoslav-Greek Frontier -- 7 May 1948

Information given here is entirely too limited for any conclusions to be drawn. Possibly the object observed was a meteor.

[redacted]

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Incident #128 -- Hobson, Ohio -- 8 May 1948

Once again, the report given is entirely inadequate for a conclusion. However, astronomical origin of the object or objects observed seems very improbable.

The phenomenon described resembles the observation of an airplane beacon or search light reflecting against an overcast. This would certainly be periodic, appear phosphorescent, travel at great speed, and be oval in shape. Such interpretation would dismiss the occasional bursting and disintegrating as a subjective impression. -- However, weather conditions are not stated.

[redacted]

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[redacted]

Incident #129 -- Wilmington, North Carolina -- 31 May 1948

Evidence in this incident is contradictory, especially concerning tactics, but from the meager description and the fact that the object emitted smoke and travelled at a high speed, the possibility of its having been a meteor is not ruled out. Apparent oblong shape might have arisen from persistence of vision of a rapidly travelling bright object.

Is there a government testing field for guided missiles near by?

[redacted]

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Incident #130 -- Plevna, Montana -- 17 May 1948

If the report is to be taken at face value, then no astronomical explanation of this incident is possible.

However, in seeking even a remote logical explanation for the incident, the present investigator is impressed with the fact that on this very night, May 17, Venus was at its greatest brilliancy, with a magnitude of -4.2, or about 100 times brighter than a first magnitude star. It would have appeared that night as an intensely bright light in the northwest.

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Incident #131 -- Belleville, Illinois -- 20 June 1948

It appears improbable that this incident has an astronomical explanation. If the evidence is correct as given, the object could not have been a fireball. The zig zag course and the relatively slow speed do not fit in with the description of a large meteor. Lack of flare and train also tend to rule out this hypothesis.

The description answers that of a lighted balloon relatively close by.

[redacted]

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Incident #132 -- Oslo, Norway -- 12 December 1947

The object observed here answers the description of a fireball, and the probability that it actually was one is very great.

[redacted]

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Incident #133 -- Norway, Denmark, Sweden -- 20-26 February 1948

Information given here is too limited for any conclusions to be drawn. The stated heights, the occurrence at the same time each night, and their specific direction makes explanation of the objects as meteors unlikely. The green tails are also not characteristic of typical meteors, but would fit into a description of rockets or flares.

[redacted]

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Incident #134, 134a -- Monroe, Michigan -- 28 May 1948

There is no direct astronomical explanation for this incident.

This investigator wishes to call attention to the fact that the objects observed were seen at essentially the same level as the lower cloud stratum and that there was a high overcast. Could it be that these officers saw successive shafts of sunlight, through breaks in the high overcast, illuminating small portions of the lower cloud stratum? Apparent speed of the objects could then have been a combination of the relative velocity of the C-47 and the projected motion of the break in the overcast.

[redacted]

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Incident #135 -- Weaver, South Dakota -- between 15-20 August 1947

For the description of this incident as given, there is no astronomical explanation.

The statements of an apparently well-trained observer can scarcely be doubted, but no interpretation, either astronomical or otherwise, other than possible detached auroral streamers, suggests itself. The moon at the time was new and the night apparently very dark, the most favorable conditions for the observation of auroral phenomena.

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Incident #136, 136a -- S. Knoxville, Tennessee -- 30 June 1948

This incident answers well to the description of a typical fireball: color -- orange; apparent construction -- fire; exhaust -- "streamer of bluish color trailing"; manner of disappearance -- "over horizon"; and (in remarks) "streamer emitted sparks."

All of the above fit the typical phenomena associated with a night-time fireball.

One witness states that the object was in sight for three minutes and the other states for three seconds. The lower time estimate is clearly more in keeping with meteoric phenomena. It is also probably far more nearly accurate, since one is much more likely to grossly overestimate than underestimate intervals of time.

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Incident #137, 137a -- Chapel Hill, North Carolina -- 7 July 1948

This report refers solely to a sound phenomenon. Statements of the witnesses indicate specifically that no object was seen. The summary sheet given here seems to confuse the description of this incident with that of incident #138.

Fireballs and bright meteors are often known to emit sounds similar to the rolling of thunder. The information given in this report is so meager, however, that, while the sound referred to could have been meteoric, no decision can be made.

It seems more probable that actual aircraft were heard.

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Incident #138 -- Columbus, Ohio -- 8 July 1948

There is clearly nothing of astronomical character in this incident.

It is the present investigator's opinion that the objects were aircraft. The "bobbing up and down" can be explained as a "seeing" effect -- that is, distortion of the image by air currents.

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Incident #139 -- Osborn, Ohio -- 9 July 1943

There is no obvious astronomical explanation for this incident.

The present investigator was struck first by the fact that the description of the incident states, "... with about a quarter moon rising in the east-southeast." The quarter moon can never be seen in that position at 2147 hours (local time), for the quarter moon sets at approximately midnight. The moon at that date was not yet at the first quarter, and it set at Osborn at about 2300. The correct statement would be, "... with about a quarter moon setting in the west-northwest." This, oddly enough, is the quadrant of the sky in which the object was reported to be seen. In what direction, then, was the observer really looking?

Although the sky was reported as clear, could it possibly be that rapidly scudding clouds periodically obscured the setting moon -- a moon which, incidentally, does have a pale yellowish-white light?

Other possibilities that suggest themselves are detached auroral streamers or floodlights or searchlights playing on the sky.

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Incident #140, a -- Gahanna, Ohio -- 1 July 1948

The object sighted here was probably a bright, slow-moving meteor. It is described as a "bright yellow-white light," moving at a "terrific" rate of speed, and was in sight for two or three seconds.

This investigator is again struck by the reference to the ubiquitous moon. "Bright moonlight" was reported; at the stated hour of observation, the moon had not yet risen.

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Incident #141 — Hecla, South Dakota — 30 June 1948

The description given here obviously does not answer to that of a star, or of any other astronomical body.

In all probability the object was a cluster of balloons, carrying, perhaps, cosmic ray apparatus. This would account for the starlike appearance and the eventual breaking up into parts.

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Incident #141 -- Hecla, South Dakota -- 30 June 1948

The description given here obviously does not answer to that of a star, or of any other astronomical body.

In all probability the object was a cluster of balloons, carrying, perhaps, cosmic ray apparatus. This would account for the starlike appearance and the eventual breaking up into parts.

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Incident #142 -- Boise, Idaho

No details are given concerning this incident. Letter from investigator indicates that observer was not sufficiently reliable to warrant consideration of his report.

[redacted]

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Incident #143 -- Columbia, South Carolina

No details concerning this incident have b

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Incident #144 -- near Montgomery, Alabama -- 24 July 1948
144a, b -- near Blacksburg, Virginia -- 24 July 1948

The famous "space ship" sighting reported in Incident #144 should be compared with #108 and 109, and also with #144a and b, which together constitute a separate incident if facts are correct as given.

For #144, there is no astronomical explanation if we accept the report at face value. The sheer improbability of the facts as stated, particularly in the absence of any known aircraft in the vicinity, makes it necessary to see whether any other explanation, even though far fetched, can be considered. The two reliable pilots obviously saw something. If one extracts from their reports parts of the description -- "tremendous bursts of flame," "cigar-shaped," "disappeared into a cloud," "orange-red flame," "time in sight five to ten seconds" -- one sees that this much, at least, could be satisfied by a brilliant, slow-moving meteor. The orange-red flame is particularly suggestive. It is pertinent also, that the only passenger awake at the time the two pilots sighted the object gave a description that does not tally with that of a "space ship" but does agree with that of a meteor.

It will have to be left to the psychologists to tell us whether the immediate trail of a bright meteor could produce the subjective impression of a ship with lighted windows. Considering only the Chiles-Whitted sighting, the hypothesis seems very improbable. However, not included in the summary but mentioned in the

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voluminous collateral material is the report of a qualified Robins Air Base observer, who stated that he saw a cylindrical object trailing a red flash of fire, but did not discern any windows or a double deck; (admittedly, from the ground he would have had less opportunity to do so). The time of his observation is exactly one hour earlier, if both times are given in EST (as is stated). It is interesting to note, however, that Macon, Georgia, and Montgomery, Alabama, are within the line of flight as described by the Montgomery observers.

If these two sightings refer to the same object, there are two possible interpretations: One is that the object was some type of aircraft, regardless of its bizarre nature. The distance between Macon and Montgomery is approximately 200 miles. From all reports the object was travelling definitely faster than 200 MPH, so would have covered the distance between the two points in much less time than that noted. (The schedule is, of course, correct for an ordinary aircraft.)

The other possible explanation is that the object was a fireball, in which case it would have covered the distance from Macon to Montgomery in a matter of a minute or two. If the Montgomery observers had been using daylight savings time (do regular

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commercial airlines connecting cities using daylight savings time operate on it?), then there would be no discrepancy in the time.

The conclusion seems to be this: If the difference in time is real, the object was some form of aircraft travelling at 300 mph. If there is no time difference, the object must have been an extraordinary meteor. The observation from two such widely separated points is the focal point of the investigation -- if one assumes that the same object was observed in the two cases. That there were two separate objects can most likely be ruled out by the sheer improbability of more than one such extraordinary object being seen on the same night, travelling over the same course, exactly one hour apart.

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The object reported in incident #144a and 144b was very probably a meteor.

It should be noted that this object was travelling in the same direction as the one reported in #144, although separated by some 400 miles. It is not unusual for a fireball to be seen along a path several hundred miles long. There is a time discrepancy of 15 minutes between the observations, however; any connection between #144 and 144a-b (in considering the meteoric hypothesis) necessarily hinges on whether this time difference was real, or not.

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Incident #145 -- Redding Lake -- 9 July 1948

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The lack of any exhaust trail and luminosity eliminates an astronomical explanation for the objects reported here.

It seems more probable that they were distant aircraft flying in formation, or migrating birds.

[redacted]

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Incident #146 -- San Acacia Dam, New Mexico -- 17 July 1948

Lack of exhaust trails eliminates any possible astronomical explanation for this incident.

It seems more probable that the objects observed were a) balloons at a much lesser distance than that estimated, b) aircraft in formation, or c) birds.

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[redacted]

Incident #147 — Springfield, Ohio — 27 July 1948

The description of this incident, although meager, is in agreement with the hypothesis that the object observed was a fireball. Thus, "bright red tail of fire," "travelled in straight line," "great height," and the short time in sight all increase the probability that it was a bright meteor. The fact that it was travelling north, at this time of night, implies that the meteor was crossing the orbit of the earth on its way toward the sun when the collision occurred.

[redacted]

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[redacted]

Incident #148 -- Springfield, Ohio -- 28 July 1948

The planet Venus seems to be the culprit in this incident. Venus attained its greatest brilliancy in the morning sky on July 31, and at approximately 0400 in the morning on July 28, it was a very brilliant object slightly to the north of east. The magnitude was -4.2, which makes it about 100 times brighter than a first magnitude star. Intermittent cloud coverage could easily explain the appearance and disappearance of the object, and as to the stated size, this can be dismissed as a purely subjective estimate. The evidence appears convincing to this investigator that the object observed was Venus.

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Incident #149 -- North Jutland -- 15 January 1948

There is nothing in the major description of this incident that precludes the possibility of the objects' being meteors. The description would also allow for their being rockets. However, the explosion of the objects favors the meteoric hypothesis.

It might be well to note the similarity of this and other Scandanavian reports to the "green flash" objects reported from New Mexico.

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Incident #150 -- Swedish coast -- 1 March 1943

The description given here is entirely too fragmentary for any conclusions to be drawn. The object sighted could have been a meteor, a rocket, or a guided missile. The fact that it left no trail in the sky argues against its having been a meteor.

Note the similarity of this incident to #149 and #133.

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Incident #151 -- Indianapolis, Indiana -- 29 July 1948

This incident and #152 are being considered together by this investigator, because they both occurred in Indianapolis, were separated by just two days, were observed at approximately the same time of day, and include certain similarities of description.

Both incidents are clearly non-astronomical.

Drawings are available for both objects observed, and, although they are considerably different, they might conceivably represent the same object viewed on edge and in plan. Both have approximately the same shape, although the scale given by one observer is about three times that given by the other. Both have 3:1 ratios of length to width. If these objects were real, it seems to be straining coincidence too far to assume that they were entirely independent of each other.

Were there by any chance some special glider experiments going on in the vicinity of Indianapolis at that time?

Barring hallucinations, these two incidents and incidents #17, 40, 75, and 84 seem to be the most tangible, from the standpoint of description, of all those reported, and the most difficult to explain away as sheer nonsense.

It should be noted that both incidents #151 and 152 had two observers.

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Incident #152 -- Indianapolis, Indiana -- 31 July 1948

There is no astronomical explanation for the object observed in this incident.

See report on incident #151 for discussion.

[redacted]

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Incident #103 -- Georgia -- 5 August 1948

The limited description which is offered here is consistent with that of a disintegrating fireball, in spite of the observer's statement that the object was not a meteor or falling star. Actually, fireballs bear little resemblance to the ordinary, frequently-seen meteors. The trail of sparks at the end is sometimes associated with a fireball.

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Incident #164, 164a -- Columbus, Ohio -- 2 August 1948

This incident is in two respects unique among all those investigated: 1) it is the only object that is defined solely by an outline, appearing vacant inside, so that the sky was visible through it; and 2) it is similar to an object that this investigator viewed as a toy.

The writer's recollection has remained vivid throughout these many years. The object he saw could best be described as a floating ellipse, like a wire hoop travelling slowly across the sky. The motion was uniform, and the form of the object changed slowly, as though the hoop were being distorted. The object was observed for at least ten minutes, with several witnesses, until it finally disappeared in the distance. The writer had dismissed the object as some sort of unusual atmospheric phenomenon, perhaps a travelling air pocket.

Because of the similarity between this observation and that reported in incident #164, the latter has a special interest to this investigator. In the recent incident, however, the tail of smoke is an added feature.

There is obviously no astronomical explanation for these incidents -- the most plausible explanation probably lies in the field of meteorology.

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Incident #156 -- Columbus, Ohio -- 31 July 1948

There is no astronomical explanation for this incident.

If the information offered is to be given any weight at all, the most likely explanation is that a cluster of balloons, or a balloon with several fire-pots hanging below it, was observed. Corroboration for this interpretation is probably furnished by incidents #155 and 157, which occurred a few hours later near this location. The object reported in #157 proved to be a "county-fair" type balloon.

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Incident #155 -- Columbus, Ohio -- 31 July 1948

This incident and incident #157, which obviously refer to the same object, must be considered together. The object fell to earth and was retrieved; it proved to be a "county fair balloon," once quite common in this part of the country. Usually they are lighted in mid-afternoon, having one or more fire-pots to provide the hot air. They then rise and stay aloft for several hours before finally falling to earth.

It is highly probable that the object described in incident #155, which was observed a few hours earlier on the same day and near the same location, was this object, seen while it was still high in the sky.

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Incident #157 -- Columbus, Ohio -- 31 July 1943

The object described in this incident can be easily identified as a "county fair balloon."

See report on incident #156 for discussion.

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Incident #157 -- Columbus, Ohio -- 31 July 1948

The object described in this incident can be easily identified as a "county fair balloon."

See report on incident #156 for discussion.

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Incident #188 -- Groveport, Ohio -- 1 August 1943

With two essential items missing (speed with which the trail was formed and length of time involved in the formation), it is difficult to come to a definite conclusion concerning the origin of the object observed, but it is entirely possible that it was parts of the smoke trail of a fireball. Fireball trails have been known to act in the manner described. The witness states that the streak was not like an anti-aircraft shell burst or a vapor trail from a plane. He implies that the motion of the object forming the trail was very rapid, and that the distance was considerable. At least, nothing is said which is contrary to the meteoric hypothesis.

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Incident #169 -- Worthington, Ohio -- 30 July 1948

No astronomical explanation is suggested by the description of this incident.

This investigator wonders whether an advertising "blimp" might not have been in the neighborhood. The time of observation was just after sunset, and a blimp would probably have given the appearance described.

It should be noted that the size of the object and distance are not stated.

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Incident #160 -- Bravoscurg, Pennsylvania -- 4 July 1948

There is no astronomical explanation for this incident.

The date of occurrence, July 4, suggests that the object seen might have been a part of some celebration -- for instance, a lighted balloon, or even a "county fair" type of balloon.

Or there may be a much simpler explanation for the incident: the observer was very close to the Allegheny County airport. Does the airport have record of either pilot balloon or small aircraft in the air at the time of the sighting? Since when the object seemed to stop it also changed direction, the stopping may have been merely the effect of perspective.

This incident does not appear to have any relation to incident #161.

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Incident #101 -- McKeesport, Pennsylvania -- c. 8 July 1948

Information offered by these two untrained, uncritical, and excitable observers can be given little weight. There does not appear to be anything astronomical about this incident; chances are that the two women saw ordinary aircraft with sunlight reflected from fuselage but not from wings.

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Incident #152 -- Mamel, Minnesota -- 11 August 1948

No astronomical explanation is possible for this incident. A meteorite would not have descended so gently, nor would it have risen again.

It seems incredible that this could have been an actual physical occurrence, but if it was, it is doubly unfortunate that no mature observers were at hand. If the object did land just a few feet away, one would think that even children would have given a more detailed description. Is it known whether the children have normal vision? To one with myopic vision, even a buzzard or hawk gliding to a landing might appear as a strange object.

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Incident #163 — VanNuys, California -- 21 July 1948

Since a complete description of this incident is given in numerous reports from Mt. Wilson Observatory and Griffith Planetarium, since the observations there were made with telescopes by experienced observers, and since their descriptions agree that the object was in all respects balloon-like, there is nothing that this investigator can add. The object was evidently an unidentified balloon.

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Incident #134, a, b -- Uniontown, Pennsylvania -- 29 June 1948

There is no astronomical explanation for this incident.

Its occurrence at the time of a thunderstorm suggests that the report might be referred to an expert on ball lightning to see whether this might be a possible explanation.

Another possibility is that the observers saw a beacon searchlight projected against clouds, although if this were the case, it should have continued visible at regular intervals.

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Incident #138, a -- Chamblee, Georgia -- 23 July 1948

The object reported in incident #138 and 138a (which presumably refer to the same thing) can be easily explained as having been a very bright meteor. The majority of observers agree that the object did not maneuver, was on a steady course, and lost altitude slowly.

Numerous other reports (included with incident #144), from the vicinity of Augusta, which are widely divergent as to time, direction of motion, and color of the object, all appear to refer to a bright meteor. It may be that these scattered reports all describe the object of incident #138, a. It could be, of course, that the state of Georgia was treated to several fireballs in one evening, but it seems more likely that we have here an example of serious dispersion in the description of one object.

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Incident #166 -- Los Angeles, California -- 30 August 1948

The observer of this incident states that the object looked like a rocket and was larger than a B-29. He does not give the distance, but estimates the altitude as well over 20,000 feet. At this implied distance, it appears to this investigator that resemblance to a rocket must have been largely subjective.

Although a rocket cannot be ruled out, it is also possible that the object seen was a bright meteor. If the hour of observation given is correct, it was late twilight. It seems that a bright meteor appearing at this time could give the general impression of a rocket leaving a trail.

The report states that the object was observed through field glasses taken from a German 88 mm. artillery piece and that each lens was 6" in diameter. (This is an improbably large size for a field glass.) If the object completely filled the lens at that given altitude, either it was of a truly tremendous size or the glass was out of focus. Furthermore, the telegram and summary state that the object was travelling from west to east (another report says from north to south); if it had been a rocket heading east, the landing would probably have been reported.

All in all, the evidence supports the conclusion that the object was more likely a bright meteor than a huge rocket.

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Incident #137 -- Pacific Ocean: 13° 09' N, 164° 05' E -- 8 May 1943

The object observed here was probably an exploding fireball seen head-on and seen only at the time of actual explosion. This, with partial cloud coverage, could easily explain the absence of a trail.

It is not likely that lights sighted on the water surface or aircraft sighted later had any relation to the original object.

If the object had been a shell fired from the USS Boxer, it appears improbable that only one shell would have been observed.

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Incident w128 -- The Hague -- 20 July 1948

The information given here is too limited even for guesswork. It is extremely difficult to take at face value the report of an aircraft with two decks and no wings travelling with supersonic speed, even if "seen four times through clouds" by the chief of the Court of Damage and his daughter. It seems much more probable that the observers had a subjective impression of ordinary aircraft or a fireball. Even though these two items are at opposite ends of the scale, there is nothing in the evidence to favor one or the other.

In passing, it is interesting to note that this incident occurred just four days before the famous "Alabama space ship." Maybe our visitors from Mars were cruising around!

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Incident #109 -- Maplewood, Ohio -- 29 August 1948

There does not appear to be any astronomical explanation for this incident.

There is some chance that the object could have been a weather balloon in the process of disintegration.

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Incident #170 -- Adapazari, Turkey -- c. 5 May 1948

It is extremely unlikely that there is any astronomical explanation for this incident. The information given is very limited, but it points definitely to the probability that the object or objects sighted were rockets. The report indicates that one rocket-like object was recovered.

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Incident #171 -- Moscow, Russia -- 3 August 1943

There is no astronomical explanation for this incident.

Perhaps the Russians were experimenting with their own or a captured German dirigible.

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Incident #172, a, b, c -- Fargo, North Dakota -- 1 October 1948

There is no conceivable astronomical explanation for this much-examined and much-discussed incident.

Analyses by a psychologist and a meteorological expert would be of importance here.

It seems significant to this investigator that other witnesses of the incident did not observe the complex tactics reported by Lieutenant Forman, although they were presumably seeing the same thing. Is it possible, then, that the pilot "took on" a lighted weather balloon? (See report on incident #207 for further discussion.)

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Incident #173 -- Shreveport, Iowa -- 13 September 1943

There is no astronomical explanation for this incident.

It appears probable that a balloon was under observation.

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Incident #174 -- near New Orleans, Louisiana -- 1 October 1948

There is a strong possibility that the object sighted here was nothing other than a fireball. The description of the object itself particularly suggests this: white hot, with red flames trailing. The course and size also fit in with the fireball hypothesis. It is an unusual time of day to see a slow-moving meteor, since in the early morning they strike nearly head-on; however, this one could have been seen after the earth's atmosphere had slowed it down very appreciably.

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Incident #175 -- Santa Fe, New Mexico -- 23 September 1948

The evidence here is so contradictory that it is very difficult even to attempt any identification. For example, one observer states that the object was stationary; the other that it was moving at a speed of 700-800 MPH. One says the elevation was 45°; the other says 70°. It is hard to believe that they were looking at the same object, even though it is so stated.

Considering #175 (Mr. Angier's statement) alone, it is possible that the object observed was the planet Venus. The location is is given as southwest and the elevation as 70°, which correspond approximately with the position of Venus at the time. The magnitude of the planet was -3.3; it could have been visible in the daylight sky. It would have appeared, however, more like a pinpoint of bright light than like a "dime in the sky." It seems unlikely that it would have been noticed at all, but since the observer was looking closely at the sky ("watching government plane come in"), he might have chanced upon it.

Considering the vast discrepancies in the two reports, it may not be amiss to suggest another, far fetched, interpretation for one or both. The moon at the time was in gibbous phase, and was a little off the horizon north of west. Most people are so unused to thinking of the moon in that position in the daytime that they fail

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to identify it. This is particularly true if one's eyesight is not on the test. While this hypothesis has little correspondence to either report, as the evidence is stated, it is worth mentioning, especially since it may be met in future sitings of incidents.

It seems far more probable that some type of balloon was the object in this case.

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Incident #176, a -- Castro's Ranch, California -- 28 September 1948

The two observers of this incident make, in several respects, directly contradictory statements: diffuse object versus definite box-shaped object, easterly line of flight versus northwesterly, etc. They agree on speed (very fast).

It does not seem likely that the incident can be explained astronomically. The only possible astronomical hypothesis would be that the object observed was the smoke mass from an exploded fireball, which would probably have an amoeba-like shape, agreeing with the description of one witness. At noon a meteor outward-bound from the region of the sun could approach the earth head-on, explode, and not leave any long trail.

However, in view of the conflicting descriptions, very little weight can be given to the whole incident. Perhaps the observers were looking at different things. There was a west-bound United Airlines plane in the vicinity at approximately that time; one observer may have seen that. The description of one observer suggests a box kite, such as those once used by weather observers.

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Incident #177 -- Kentwood, Louisiana -- 5 September 1948

Contradictory opinions concerning the existence of the alleged unusual noise and the dubious personality of the reporter of this incident make serious attention to the incident impossible.

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Incident #178 -- Honolulu, T. H. -- 18 October 1948

There does not appear to be any astronomical explanation for this incident. The moon had not yet risen at the time the object was sighted, although it was about to rise in the northeast.

The object may have been a balloon reflecting the light of the setting sun.

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Incident #179 -- San Francisco, California -- October 1947

There is no astronomical explanation for this incident. The extremely incoherent and unreliable nature of the report of the incident makes serious consideration futile.

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Incident #130a, b -- South Bend, Indiana -- 13 October 1948

There is no astronomical explanation for this incident. Reflection of the sun from a balloon or aircraft appearing in foreshortened position might possibly account for the description given here.

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Incident #181 -- near Layton, Ohio -- 14 October 1948

There is no astronomical explanation for this incident.

Since the speed of the plane was 180 MPH, if it had passed through a cluster of small balloons, a flock of migrating birds, or any other group of relatively stationary objects, they would undoubtedly have appeared to observers within as objects whizzing by, much as telephone poles appear from a window of a speeding train. Little credence can be given to the pilot's statement that the objects could not have been migrating birds; there would have been no time for identification.

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Incident #182 -- Japan -- 15 October 1949

There does not appear to be anything astronomical about this incident.

Radar experts should determine the reliability of the data, particularly concerning acceleration rates.

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Incident 2132 -- at sea: 74° 40' W, 38° 42' N -- 15 October 1948

The bearings and motion given in this report by the Master of the SS Gulfport do not correspond to those of any celestial object.

From the reported size and shape and the statement that the object had a bright center, one can surmise that it was spherical -- probably a balloon.

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Incident #104 -- Winona, Minnesota -- 20 October 1948

This incident and #105 appear to be a clear-cut case of a fireball. Strongest evidence is the fact that the object was seen in several communities at the same time. While the reports given in the Minneapolis Morning Tribune article conflict in minor details, the general sense of the description of all observers fits that of a fireball.

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Incident #184, a, b -- Minneapolis, Minnesota -- 20 October 1948

The object reported in this incident is the same as that in #184, seen from a different locality. The description of the incident leaves no question but that the object observed was a fireball.

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Incident #186 -- near Sterling, Utah -- 13 October 1948

There is nothing astronomical in this incident.

It should be pointed out that, since the object was in sight just a few seconds, even a conventional aircraft under peculiar lighting conditions might have given the reported appearance. The estimated distance of 500 feet, if correct, should have allowed much more detailed observation. Probably the distance is grossly underestimated.

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Incident #137 -- Godman Air Force Base, Kentucky -- 19 August 1943

There can be no question but that the object sighted in this incident was Venus. It was just three weeks past its period of greatest brilliancy, and was separating from the sun. The close agreement between the observed position of the object and the actual position of Venus, determined by others concerned with the incident and rechecked by this investigator, is convincing.

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Incident #138 — Goose Bay, Labrador — 20 October 1948

There appears to be nothing astronomical in this incident.

Judging from the speed and apparent size of the object, it seems that a balloon may have been picked up by the radar.

Radar experts should evaluate these sightings.

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Incident #130 -- Albany, Georgia -- 22 September 1948

There is nothing astronomical in this incident.

Since the object looked like a drone, perhaps it was one.

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Incident #100, a, b -- Neubiberg AF Base, Germany -- 11 October 1948

The position of this object in the sky (northeast at an altitude of 70°) rules out any possible astronomical explanation. The moon had not yet risen at the time.

The description appears to fit that of a high-altitude balloon.

Question: If there had been "no release of airborne weather equipment prior to or during sighting," where did the information concerning winds aloft come from?

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Incident #191 -- near Junction City, Kansas -- 24 October 1948

There is no astronomical explanation for this incident.

The description given is sketchy and would be entitled to no weight whatever if it had not been reported by a responsible USAF officer. With size, shape, time in sight, tactics, and sound not stated, it is impossible to say anything further than that this seems to be a typical example of the "garden variety" of flying saucer.

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Incident #192 -- near Moorhead, Minnesota -- 24 October 1948

Despite the observer's statement that the object seen could not have been a meteor, the possibility is not ruled out. Early evening is the most propitious time for the observation of slow, bright meteors. This is the time of day when a meteor inbound to the sun and caught by the earth's gravitational field would appear to travel from east to west, and could appear to rise slightly. Most people identify meteors with sharp, fast flashes of light, which are not at all characteristic of slow fireballs. The observed turn is difficult but not impossible to explain; this investigator would prefer, however, to think that it was an illusion caused by perspective.

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Incident #193 -- near Neudorf, Germany -- 24 October 1943

It is very unlikely that this incident has any astronomical explanation. No trail nor luminescence was observed, and the object flew a straight and level course. Time in sight (two minutes) also effectively rules out any possible astronomical hypothesis.

Could the object reported here have been a conventional aircraft viewed in foreshortened aspect?

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Incident #134 -- near Andrews Field -- 5 November 1948

No astronomical explanation is possible for this incident.

The object reported has been independently identified as an MIT cosmic ray balloon cluster.

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Incident #194 -- near Andrews Field -- 3 November 1948

No astronomical explanation is possible for this incident.

The object reported has been independently identified as an MIT cosmic ray balloon cluster.

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Incident #136 -- Goose Bay, Labrador -- 31 October 1948

The object reported in this incident has no astronomical explanation: speed was too slow and time in sight too long.

The object, observed on a radarscope, was probably a balloon or unidentified aircraft.

Question: Is the speed indicated the radial velocity of the object or true space velocity? If the latter, it is obviously too slow for conventional aircraft.

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Incident #196 -- Goose Bay, Labrador -- 1 November 1943

There is no astronomical explanation for this incident.

The object could have been balloon radiosonde.

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Incident #137 -- Richmond, Indiana -- 5 November 1948

This incident very likely has an astronomical explanation; the object sighted was probably Venus. Venus rose on November 5 at about 3:30 A. M. and an hour later would have been a little south of east at an altitude of about 10°. Its magnitude was -3.4, or about six times brighter than the brightest star in the sky. The photograph taken of the object sighted does not contradict this hypothesis.

It is unlikely that the object observed was the bright comet (1948L) discovered one day earlier in the southern hemisphere, for this comet at that time was very far to the south and east, almost on the horizon, and was very much fainter than Venus. If the object seen here had been the comet, the persons observing it could lay claim to the first discovery. It was discovered one day later in Australia because of much more favorable location.

Venus, of course was visible all during the autumn of 1948 in approximately the same position as that in which it was seen on the morning of November 5.

It is also of interest to note that Mercury had its greatest western elongation on November 5, but it rose just at the beginning of the morning twilight and would therefore have been just rising at the time of this incident. Furthermore, Mercury was much less brilliant than Venus.

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Incident #198 -- Hakkanai, Japan -- 3 November 1948

This incident has no astronomical explanation.

The object has been independently identified from radar information as a Soviet aircraft.

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Incident #199 -- near Grays Harbor, Washington -- 30 October 1948

From the meager information given by Lieutenant Munzman, presumably a responsible and well-trained observer, positive identification of the object is impossible, but it appears likely that it was a bursting fireball.

The bits of evidence that tend toward this interpretation are the following: one object bursting into ten or twenty pieces, color white and yellow, and the short time in sight. Manner of disappearance, simply fading from view "like fumes from an airplane," is also similar to that of a disintegrating fireball; in bright daylight the otherwise bright, flare-like quality is sometimes not observed.

Against this interpretation are the following: no lights or outstanding reflection, and no trail. The former might be the result of bright daylight; obviously the objects were observed, and if they were yellow and white, they must have had some luminosity. Lack of trail is, however, unusual.

Unfortunately, without more detailed information, little more can be said.

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Incident #200, a, b, c -- Crescent City, California -- 17 October 1948

This incident has no astronomical explanation.

Although the four observers had no technical training, their reports are remarkably consistent. The object was in sight several minutes, too long to be a meteor; it made a banking turn of 45° and appeared to reflect sunlight very strongly. The speed was great but not excessive.

The object seen could have been an advertising blimp, a balloon, or an aircraft. The banking turn appears to rule out the balloon, unless this was a subjective impression caused by the turning of the balloon in the wind.

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Incident #201, a, b -- Army Air Base, Azores -- 31 October 1948

There appears to be no astronomical explanation for this incident.

The observers agree in the general description, but not in the speed of the object: speeds are given from 30 to 800 MPH.

The most likely explanation on the basis of the meager information offered is that the object was a balloon carrying a swinging light.

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Incident #262 -- Newark AF Base, New Jersey -- 8 November 1948

In everything but the luminosity, the object reported here answers to the description of a slow-moving fireball. Since it was in sight "one second or less," the first quarter moon and, presumably, the lights of the city and the airport, providing background and foreground illumination, may have tended to diminish the brilliance of the object. The time of day was most propitious for a slow-moving meteor. Unless a more likely explanation is forthcoming, this incident can be tentatively ascribed to the flight of a fireball.

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Incident #203 -- Alberta Province, Canada -- 17 November 1948

The object reported in this incident was certainly a fireball. The description fits very closely.

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Incident #204 -- Panama -- 8 November 1948

It seems entirely probable that the object sighted in this incident was the comet 1948L, which had been discovered two days earlier in Australia. The comet was suitably placed for observation near the equator and in the southern hemisphere. The time of observation also checks closely with the time of visibility. There is no single statement in the limited report that contradicts the comet hypothesis. If the observer had given the actual bearings of the object, these would have clinched the matter.

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Incident #205 -- Carthage, Missouri -- 31 October (?) 1948

The vague nature of the information reported in this incident and the inferred unreliability of the observer makes it difficult to take the incident seriously, especially since the observer has obviously jumped to conclusions on the basis of insufficient evidence.

However, if credence is given to the observations, either they must be placed with the group of "aluminum-colored objects," or, if liberal allowance is made for subjective impressions, one could stretch a point to say that a slow-moving fireball was seen. This hypothesis is far fetched, but the speed of the object and the time of day favor it. The fact that the observer stated that the object was aluminum colored actually means little, since he immediately identified it as a flying saucer, which he knew from newspaper reports to be such a color.

It is very difficult to deal with reports of untrained and unreliable observers, because they invariably see in an incident what they wish to be there.

From a purely physical basis, this investigator would prefer the meteoric hypothesis, even though the evidence is entirely insufficient to establish it.

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Incident #208 -- Clark AF Base, Philippine Islands -- 12 November 1942

Two things enter heavily into any possible interpretation of this incident: the reported maneuverability of the object, and the character evaluation of the witness.

If the facts are as stated, then there is no astronomical explanation for the object observed. A few points favor its having been a daylight meteor: the snow-white color, speed faster than that of a jet plane, roaring noise, similarity to "sky writing," and the time of day of the observation. The tactics, however, if really performed, oppose it strenuously.

The question is, did this object actually maneuver in and out of a cloud bank -- i.e., did it make turns of 180° or more? It is possible that such impressions were merely illusions. The witness saw the object intermittently through clouds. It is not clear whether he ever saw it against a cloud background or only in the sky background between clouds, a fact which is highly important. If he saw it only in breaks between clouds, this fact, coupled with its great speed, makes it clear that only momentary impressions could be obtained. Such observations, by an untrained observer, may bring forth a description that is extremely unlike the facts.

The impression of a fuselage with windows could even more easily have been a figment of the imagination.

Unless more specific information concerning this incident becomes available, the present investigator cannot say whether an astronomical explanation is possible, or not.

[redacted]

UNCLASSIFIED

Incident #207, a, b, c -- Andrews AF Base, Camp Springs, Maryland -- 18 November 1943

There is no astronomical explanation for the object observed in this incident.

The similarity of the incident to #172 is striking, and it suggests a common origin for the objects. The two incidents were separated by a month and a half and by half a continent. The hours of observation were about the same. It may be significant that ground observers in each incident did not report the evasive tactics described by air observers, and it is tempting to hazard the guess that such tactics were largely the result of relative motion. It should be investigated whether a lighted balloon caught in the prop wash could give the appearance of a rapidly-maneuvering aircraft. In fact, this investigator believes that it would be an interesting experiment to have a typical lighted balloon engaged by aircraft at night, with a competent observer along to record apparent relative tactics of the balloon.

(It is not clear whether the two observers in this incident who reported evasive tactics were in the same plane, or not, but it is presumed that they were.)

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident #208 -- Clark Air Base, Philippine Islands -- 17 November 1948

The limited information in the description of this incident can be explained as referring to the trail and explosion smoke left by a fireball. The white exhaust trail extending some one to ten miles, the "flak-like" terminal burst, the estimated altitude, and the color and time in sight all concur in ascribing this sighting to a fireball. The time of day of the observation is also in agreement.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident #209 -- South Korea -- 4 November 1948

There is no astronomical explanation for this incident.

The object has been independently identified as a Soviet aircraft.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident #210 -- Boston, Massachusetts -- 10 November 1949

There is no astronomical explanation for this incident.

The objects seen were apparently conventional aircraft. It is rather surprising that, in the dim light, the observer could identify them as single-engine planes, and yet could hear no sound from them.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident #211 -- Bellefontaine, Ohio -- 4 December 1948

There is no astronomical explanation for this incident, in view of identification of recovered materials as man-made. Apparently there has been independent identification of the object as a pistol flare fired from the ground.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident #213 -- Dayton, Ohio -- December 1941

Little can be determined from the brief guidance concerning this incident. Two half-round pulses of light was apparently all that was seen. It is unlikely that any determined origin can be found for the object or objects observed, and certainly on the basis of so little information not even a guess can be hazarded.

See report on Incident #218, which apparently refers to the same phenomenon.

UNCLASSIFIED

[redacted]

Incident #13 -- Dayton, Ohio -- 5 November 1948

This incident may represent the same phenomenon indicated in #11. The description here is more detailed.

The object could not have been a meteor, since observers state that it was in view several minutes and that it was rapidly ascending, and disappeared overhead.

The moon was at crescent phase, and this investigator has often seen it at this phase appearing through small breaks in overcast, at which time it gave the appearance of a bright light flashing on and off. At the time of this incident, however, the moon was in the southwest, whereas the observers state that their object was in the northwest. The altitude given does approximately with that of the moon.

[redacted]

Incident #14 -- West Windsor, Hampshire -- 7 July 1945

Inasmuch as the metallic particles concerned in this incident have been independently identified at MIT as parts of a cast-iron cylinder, an astronomical explanation of the incident is precluded. However, as a matter of general interest, it should be noted that iron meteorites could have produced the same effect. It is assumed, of course, that the MIT examination excluded the possibility of these particular particles' being meteoritic.

[redacted]

[redacted]

UNCLASSIFIED

[redacted] -- Fairfield Suisun, California -- 3 minutes [illegible]

If the observations were actually as stated by witnesses, this "tail effect" would not have been a fireball. However, astronomers receive such [illegible] and fireballs that they are regarded for almost any kind of a story.

Even trained observers are known to be greatly fooled by the illusion of closeness; cases on record of fireballs which were reported to have fallen in adjacent fields, but actually came to earth some 200 miles away.

A fireball would not come into view at 1000' and rise to 20,000'. If this observation is correct, an astronomical interpretation for the incident can be ruled out. Under atypical conditions a fireball might, however, appear to rise somewhat, as a result of perspective as it slants into the earth's atmosphere.

Absence of trail and sound definitely does not favor the meteoric hypothesis, but, as in other cases, does not rule it out with finality.

It does not seem likely that any known meteorological or auroral phenomenon would have been as bright as this object was reported to be.

In the almost hopeless absence of any other natural explanation, one must consider the possibility of the object's having been a meteor, even though the description does not fit very well.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident [illegible] -- Champaign-Urbana, Illinois -- 1 September 1965

... fairly bright, slow-moving object. Police efforts at explanation for the object reported in it is [illegible]. The apparent rise can be explained as an effect of perspective. There is nothing in the description given that is contradictory to the orbital hypothesis.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Enclosure (217) -- [illegible] Sylvania -- 8 October 1947

There is no astronomical explanation for this incident.

The object seen could easily have been a balloon, for apparent speed could have been a result of the observers' own motion. Even if an object were standing still, observers in an airplane would not see it for much longer than the time reported here (7 minutes).

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[redacted]

[redacted]

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Incident #213 -- near Martinsburg, West Virginia -- 11 December 1948

As described, the object seen in this instance could have been a parachute flare. Under circumstances of a head-on approach, a meteor can appear stationary; however, the time in sight, (one minute), if accurate, argues against the object's being a meteor. Therefore, while it is possible that the incident has an astronomical explanation, it is more probable that a flare was seen, observed.

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[redacted]

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E

Incident #21 -- October 1, New York -- to November 1st.

The object reported in this incident is clearly a slow-moving fireball. Time of day, length of time observed, and all other data check with the bolide hypothesis.

B

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[redacted]

[redacted]

Institute [illegible] -- Sunnyslope, California -- 12 November 1[illegible].

There is good reason to believe that the object observed in this instance was a bolide. The fact that the observer, although a science teacher, confused the term comet with meteor is strong evidence that he is unfamiliar with these phenomena: a comet appears stationary in the sky over a relatively long period of time. While the evidence is insufficient to establish with any certainty that the object was a bolide, it appears to this investigator, none the less, to be the most probable explanation.

[redacted]

[redacted]

UNCLASSIFIED

Incident #241 -- Midland, Michigan -- 5 July 1947

From the chemical analysis (see portion in this document) of the material turned in to the laboratory, it is evident that there is no astronomical explanation for the object. Meteorites do not include in their contents silver pellets or magnesium hydroxide.

This incident was evidently a prank or a private experiment. (Observer may or may not have been the instigator.) Since the event occurred on July 5, it is possible that chemicals left over from a Fourth of July celebration were used; the magnesium content might imply this.

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[redacted]

[redacted]

F

Incident #22 -- Furstenfeldbruck, Germany -- 24 November 1943

The tactics described by this object, if correct, and the implied time in sight (long enough to call others to see it, are strongly against an astronomical interpretation for the incident.

The object might have been a balloon with a light on it.

[redacted]

[redacted]

UNCLASSIFIED

Incident #218, a-c -- New Mexico -- 8 December 1948

Since several separate sightings are encompassed by Incident #223 to 226c, it must be regarded as a composite incident, occurring during one night and referring to several distinct phenomena. The reports in #226 appear in turn to be a part of a larger series of incidents, all concerned with the "green meteors" or "green flashes" which have appeared in and near New Mexico, and the present statement applies to some degree to all of them.

In his letter of December 20, 1948, to Lieutenant Colonel Hoes of the CSI, my colleague Dr. Lincoln LaPaz has summarized thoroughly the nature of these incidents and, particularly, has noted the reasons why the objects concerned cannot be dismissed as ordinary meteoric phenomena. Dr. LaPaz is an extremely able man in the field of meteoritics and an enthusiastic, almost to the point of extravagance, investigator and worker. On the basis of the description at hand, I concur in his conclusions. Dr. LaPaz, who is "on location" and has observed at least one of these objects at first-hand, should be fully supported in a continued investigation. Apart from the unusual appearance of the objects, the pattern of incidents is particularly striking. It would be exceedingly unlikely that so many meteors would appear in that small sector of the Southwest and nowhere else; if they did, they would not have consistently horizontal paths and

- more -

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[redacted]

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head in a consistent direction. These points alone are sufficient to dismiss the meteoric hypothesis. It is entirely possible that, of the many incidents reported, one or two of the objects may have been fireballs, thus serving to confuse the issue, but a blanket explanation of that sort is improbable.

I would suggest that Dr. Buck Weaver, Director of the New Mexico School of Mines, be contacted. He is conducting highly classified experiments in very high velocity projectiles and may be in a position to offer a worthwhile opinion. High velocity experiments, probably in connection with preliminary trials in the production of artificial meteors or artificial satellites, may prove to be the explanation of these incidents. Such experiments would not be conducted at any of the recognized air bases so far contacted.

Note: It has come to my attention since the writing of the above that Dr. Lucas, in the March issue of Popular Astronomy (Vol. 2, p. 130) refers to "the spectacular meteoric display of [illegible] December 6" in northeastern New Mexico. It would seem an unusual coincidence that the sightings reported in this incident occurred on the same evening and yet were entirely apart from it. The apparent contradiction is puzzling.

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[redacted]

[redacted]

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Incident 221 -- near Los Alamos, New Mexico -- a daytime lum-

Los Alamos report on Incident 221 for detailed statement.

The present incident, if it were an isolated case, would be suggestive of a fireball, but, in view of significant differences and the general pattern of other related incidents, that explanation is improbable.

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[redacted]

[redacted]

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Incident #28 -- near Vaughn, New Mexico -- latter part of 1947
3 or 4 November 1947
24 November 1947

It is difficult to ascertain whether the objects described in this incident belong to the general group of "New Mexico rocket flashes," or not. The description here is sufficiently different from the majority to indicate that they do not: the characteristic green color is not mentioned.

It is improbable, however, that the three separate sightings, all occurring at approximately 2200 hours and in the same locality, can be explained as astronomical phenomena. Furthermore, the stated altitude and distance are entirely out of keeping; this fact might be discounted as an illusion, common in the observation of fireballs, if the instance were isolated. The weight of the evidence, however, inclines to the conclusion that the objects were man-made devices and part of some scientific experiments, so common in that section of the country.

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[redacted]

[redacted]

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Incident #22[illegible] -- Sandia Base, New Mexico -- 8 December 1947

See report on incident #223 for detailed statements.

Again, it is more probable that the object seen is related to the "New Mexico green flashes" than that it was a fireball.

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[redacted]

[redacted]

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Incident #227 -- near Hermel, New Mexico -- 12 November 1948

There is nothing that the present investigator can add to the detailed analysis given by the observer of this incident, Mr. Lincoln Lamaz.

See report on incident #223 for discussion.

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[redacted]

[redacted]

UNCLASSIFIED

Incident #266, 1951

No information (other than the names of observers) concerning this incident has been received by the present investigator.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident #220 -- Boca Raton, Florida -- 10 [illegible] 1947
220a -- Riviera Beach, Florida -- 14 [illegible] 1947

There seem to be two separate occurrences to detail in this incident, and the information given for each is entirely insufficient for adequate analysis.

In #220, the location of the object in the sky is not given, nor is the hour of observation. The moon and Jupiter were visible in the early evening, the moon quite high, and Jupiter setting in the west. One might hazard a guess that Jupiter seen through a variable mist or high, thin cloud coverage appeared to blaze up and die out. The larger planets often become momentarily spectacular when they are very near the horizon and the weather conditions are right.

#220a occurred at dusk, with the observers looking out over the ocean. The nearly-full moon was fairly high in the southeastern sky at that time; there might possibly be some connection between it and the object observed, if weather conditions were unusual.

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[redacted]

UNCLASSIFIED

Incident #250 -- near Fort Rock, Oregon -- 4 August 1947

If it were not for the intense green color of this object, it would answer the description of a fireball. In view, however, of many similar occurrences in the New Mexico area, this interpretation is open to question. It should be noted that this incident occurred very much farther north than did the majority of the "green fireballs," but that the observer was facing south. Nevertheless, considering the geographical difference, and the difference in season and in time of night of the observation, this object could very well have been a fireball. Insufficient evidence is offered to decide whether it belongs among the New Mexico objects or among the fireballs.

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Incident #201 -- Abilene, Texas -- 1 January 1943

This incident was no astronomical or lunation.

The fan-shaped glow that extended momentarily from the horizon to the zenith suggests a man-made disturbance -- electrical or explosive. The green color is the only characteristic that might connect this incident with the "New Mexico green fireballs"; the rest of the description does not.

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[redacted]

[redacted]

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1

Incident #234 — Somerset, New Jersey — 11 November 1948

The information available concerning this incident is entirely insufficient to serve as a basis for analysis.

1

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[redacted]

[redacted]

UNCLASSIFIED

Incident #238 -- near Madison, Mississippi -- 1 January 1948

There is nothing in this incident that can be said to have an astronomical origin.

The object sighted is described as resembling a tow target, but with no towing plane seen. No one else reported seeing the object after this one sighting by several persons.

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[redacted]

[redacted]

UNCLASSIFIED

Incident #284 -- [illegible], Tennessee -- July 1947

Inasmuch as independent analysis has determined the object on the photographs to be a plane, there is no need for further investigation. Object was never seen visually.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident #23. -- Indiana County, Pennsylvania -- probably early December 1952

There appears to be no astronomical explanation for this incident.

The object seen was most likely a balloon.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident #23) -- Hickam Field, Hawaii -- 4 January 1948

There is clearly no astronomical explanation for this incident.

The account given seems trustworthy, even though only one person saw the circular disc. This report differs from many others in that the description of maneuvers executed by the object is definite, rather than hazy.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident #867 -- Bourbon County, Kentucky -- 17 January 1952

There is some confusion as to whether the object or the smoke trail reported in this incident was visible for fifteen minutes. If the object itself was, it could not have been a meteor, but the gist of the report seems to indicate that only the trail was visible for any length of time. In that case, it could have been either the trail from a meteor or the vapor trail from an aircraft: the description is not sufficient to distinguish the two. Other observers (not those reporting the incident) indicated that the object was a high flying plane with a vapor trail, but this does not necessarily exclude the meteoric hypothesis, because of the general unfamiliarity of the public with such phenomena.

UNCLASSIFIED

[redacted]

[redacted]

UNCLASSIFIED

Incident #233 -- Indian House Lake, [redacted] -- 21 January 1948

From the limited information [redacted] this report on this incident, the object observed [redacted] believed to have been a fireball.

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[redacted]

[redacted]

UNCLASSIFIED

Incident #280 -- Phoenix, Arizona -- 24 October 1948

This incident as described is not amenable to any astronomical explanation. The object took 75 minutes to cross the sky.

The witness apparently is not a very critical observer (i.e., there could be no possible physical connection between the object's brightness and its apparent distance from a star).

The object could have been a lighted balloon; speed and maneuvers check.

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[redacted]

[redacted]

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Incident #248 -- near Reed River, Oregon -- 11 December 1948

The gist of this incident is that a flash of light was seen and a continuing sound of explosion heard at about 7:30 on a rainy evening. Clearly this description could apply to any large explosion, such as that of an ammunition dump or factory; however, it is true that when a bolide explodes a blinding flash of light is seen, and thundrous sounds are sometimes heard for many seconds. Since the sky was overcast at the time of this incident, and a light rain was falling, the earlier part of the trail of the fireball (if that is what it was) was, of course, not visible; only the flash from the final explosion, which would have appeared essentially stationary, was seen.

In the absence of positive evidence of any other type of explosion occurring in that vicinity at the time, it is the opinion of this investigator that a bolide explosion was observed.

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[redacted]

[redacted]

UNCLASSIFIED

Incident #561, a, b -- Los Alamos, New Mexico -- 31 December 1948

Mr. Lucas, who has interviewed the various observers of this incident, has stated that the object seen was not a falling meteorite. He had access to more detailed information than is contained in the typed reports offered here, and he is an expert in these matters.

It should be noted, however, that the reports available to this investigator show many contradictions concerning the color and trajectory of the object. One observer gives the angle of fall as 45°; another states that the trajectory was horizontal. Most observers indicate a bluish-white light; only one mentions the color green, which is so predominant in the New Mexico "green flashes."

It is not at all certain that the object observed here belongs to the "green flash" family of incidents.

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[redacted]

[redacted]

Incident #248 -- Los Alamos, New Mexico -- 8 January 1949

The information offered concerning this incident is meager, and there was only one observer. According to the description, a brilliant green incandescent light was seen low on the horizon for about two seconds. Speed was "slow" -- slower than that of a meteor. In view of this scanty evidence, no definite conclusion can be drawn.

If it were not for the fact that the incident appears to belong in the family of New Mexico "green flashes," the object could be considered to have been a slow meteor, even though the time of night of the sighting does not favor that hypothesis. It is much more probable, however, that this incident falls into the pattern of those dealt with in detail in the report on incident #223. See that report for further discussion.

[redacted]

[redacted]

UNCLASSIFIED

Incident #248 -- Los Alamos, New Mexico -- 22 December 1947

The object described here seems to belong to the mysterious family of "New Mexico green flashes." See report on incident #220 for detailed discussion.

It can be said, however, that if this is regarded as an isolated incident, the description is not very different from that of a fireball. It is the occurrence of these incidents in a seemingly definite pattern that argues very strongly against the meteoric hypothesis.

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[redacted]

[redacted]

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Incident #241 -- Kirtland Field, Albuquerque, New Mexico -- 12 October 194[illegible]

The evidence given concerning this incident does not vary to any appreciable degree. If the object was a bright white light, diminished and two feet long, and only a third of a mile away, then it seems incredible that it could have been observed over only a 300' trajectory. And a bright light, that close, in a populated area, surely would have attracted the attention of more than one person.

The whole report suggests a physiological optical illusion rather than a real object in the sky. The evidence is incomplete: the angle is not stated, nor is the elevation or bearing of the object even implied. The manner of disappearance is not told: did the light simply go out abruptly, or did it fade out gradually, or what?

There is a remote possibility that the observer saw a daylight meteor over a very short part of its trajectory, but if this had been the case, there should have been some sort of a trail.

The method of reporting and interrogation in this incident is very poor. It would seem that if the observer was aware enough to note a length of 2' and a trajectory of 300', he would also have known the bearing and elevation of the object and its manner of disappearance.

The whole incident lacks a sense of physical reality.

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[redacted]

[redacted]

UNCLASSIFIED

The preceding pages complete the analyses required to fulfill the terms of Contract No. W33-038-1118 (Ohio State University Research Foundation Project No. 364)

Note: In submitting this report it is understood that all provisions of the contract between The Foundation and the Cooperator and pertaining to publicity of subject matter will be rigidly observed.

Investigator Dr. Allen Henick Date May 1, 1949

Laboratory Supervisor George W. Harding Date May 1-1949

For the Ohio State University Research Foundation

Executive Director James L. Owens Date 5/9/49
J.W.K.H.

[redacted]

UNCLASSIFIED

APPENDIX C-1

Headquarters Air Weather Service

Analysis of Incidents Nos. 1-172

B/Ltr from AMC
dtd 5 Jan 1949
Subj: Project
"SIGN"

AWS DSS 1st Ind 24 Jan 1949

HEADQUARTERS, AIR WEATHER SERVICE Andrews Air Force Base, Washington 25, D. C.

TO: Commanding General, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio
ATTN: MCIAXO

Investigations by this headquarters reveal that a synoptic weather balloon could have been at the location where sightings were reported in the following incidents. In compiling this list consideration was given to the wind direction and speed at the surface and aloft at the scheduled time of balloon release, and the location of the nearest weather station making balloon observations.

2	52	91	126
3	72	93	146
4	73	94	155
25	78	105	166
28	81	113	169
36	87	115	172

FOR THE CHIEF AIR WEATHER SERVICE

/s/ W. A. West
W. A. WEST
Lt. Col., USAF
Adjutant General

2 Incls:
n/c

HEADQUARTERS
AIR MATERIEL COMMAND
Wright-Patterson Air Force Base
Dayton, Ohio

MCIAXC-3/HWS/ra
Jan 5 1949

MCIAXO

SUBJECT: Project "SIGN"

TO: Chief, Air Weather Service,
Andrews Air Force Base,
Washington 25, D. C.
ATTN: DSS

1. Project "SIGN" is responsible for the collection, investigation and interpretation of data relative to sighting of unidentified flying objects. Attached Incident Summaries 1 thru 172 from the files of Project "SIGN" are forwarded for study and recommendations as to which of the incidents may be eliminated as balloons released on routine synoptic ascents by the Air Weather Service, the Navy Aerological Service or the United States Weather Bureau. The summaries attached may be retained in your headquarters for working and reference purposes.

2. The Air Weather Service is the only agency of its type that has been asked to assist in the accomplishment of Project "SIGN" except that the United States Weather Bureau has provided information on ball lightning. Research projects in which balloons are used and which are conducted or sponsored by the Army, Navy or United States Air Force are checked by the Intelligence Department of this Command. These checks areusually made direct from the Project "SIGN" Office, MCIAXC-3. These checks are distinct from the check of synoptic balloon flights made by weather service stations of the Air Force, the Navy and the Department of Commerce. (U. S. Weather Bureau) requested of Air Weather Service.

3. It is the opinion of this office that the below listed incidents are those having the greatest possibility of being balloons. This list does not eliminate the possibility that many of the remaining incidents are balloons.

2	24	50	91	113	155
3	25	52	92	115	156
4	28	72	96	126	157
11	30	73	104	141	159
14	31	81	105	148	163
16	32	87	107,8,9	151	167
22	33	89	112(See122)	154	169
23	48				

T-84461-A

Hq AMC, Chief, Air Weather Service, Washington 25, D. C.
Subj: Project "SIGN"

4. The form used in interrogating witnesses to sightings is inclosed as a matter of interest. Comment as to possible improvement of the "Essential Elements of Information" in regard to routine synoptic balloon flights is invited.

5. It is requested that correspondence be forwarded to the Commanding General, Headquarters, Air Materiel Command, attention MCIAXO-3.

FOR THE COMMANDING GENERAL:

/s/ W. R. Clingerman, Col, USAF
for H. A. McCOY
Colonel, USAF
Chief, Intelligence Dept

2 Incls:
Summaries 1-172 incl
"SEI"

Copies furnished:

APOIR, Hq. USAF
Capt Trakowski, Geophysics Lab
Major Kodis, MCREEP
Colonel Neal, MCLAWS

T-61,451-A

APPENDIX C-2

Headquarters Air Weather Service

Analysis of Incidents Nos. 172-233

HEADQUARTERS
AIR WEATHER SERVICE
Andrews Air Force Base
Washington 25, D. C.

In Reply
Refer To: AWS DSS

11 May 1949

SUBJECT: Unidentified Flying Objects

TO : Commanding General
Air Materiel Command
Wright-Patterson Air Force Base
Dayton, Ohio
ATTN: MCIAXO-3

1. Reference is made to letter from your headquarters, MCIAXS, dated 9 March 1949, subject "Unidentified Flying Objects," and first indorsement thereto by this headquarters, dated 31 March 1949.

2. The incident summaries 173 through 233 have been checked against routine weather-balloon ascents made by the Air Force, Navy and Weather Bureau. Comments based on this review are inclosed.

3. It is recommended that the "Guide To Investigation Of Unidentified Aerial Objects" be changed as follows: Item 13, "Direction of Flight of Object," should be clarified so that vertical and horizontal motions are distinguished if possible, and so that motion is specified as the direction towards which the object appears to move. "Relative to Radar Settings" should include a statement of the type of radar set used.

FOR THE CHIEF, AIR WEATHER SERVICE

/s/ W. A. West
W. A. WEST
Lt. Col., USAF
Adjutant General

2 Incls:
1 - Incident Summaries
2 - Comments 173 thru 233

No. 173: Rawinsonde released from Barksdale AFB at 1500 CST. Shreveport under influence of very tight low of a local nature which extended through the 500 mb. level. In all probability, rawinsonde balloon path was circular following isobar curvature around Shreveport, hence balloon was seen approximately two hours later in the same area. Assuming a balloon leak, not altogether uncommon, the rawinsonde could have remained low enough to be seen. Winds reported as high as 70K account for speed. Conclusion: Rawinsonde balloon.

No. 174: Nearest pilot balloon sounding release was at Lake Charles at 0300 CST. Wind flow WNW in lower levels, changing to SSW with altitude. No winds of high enough velocity to carry pilot balloon sounding from Lake Charles to New Orleans in time interval were reported. Only other release in the area was at Biloxi, North of New Orleans. Winds aloft were WSW. Speed stated by observer of 300 M.P.H. is approximately 15 times greater than any wind reported for that area. Conclusion: Not a balloon.

No. 175: Pilot balloon sounding released from Albuquerque at same time as observation. Upper winds show WNW flow hence could not have been the AB balloon. Great differences of opinion exist as to speed and shape of the object. One observer states that the object was not a weather balloon. All evidence indicates that this is true. Conclusion: Not a balloon.

No. 176: Navy rawinsonde and Weather Bureau pilot balloon sounding were released approximately one hour prior to sighting. Wind flow, however, was WNW at all levels from the surface to 15,000 feet which would seem to preclude the possibility of either balloon drifting North to the San Pablo area. Both witnesses also agree that the object was travelling at high speed. Winds for that region did not exceed 25 K. Conclusion: No balloon.

No. 177: Crack-pot report; insufficient information to evaluate.

No. 178: No weather balloons were released in the vicinity on the date mentioned.

No. 179: Crack-pot report; insufficient information to evaluate.

No. 180: No date given hence no analysis possible.

No. 181: This obviously inaccurate report says in effect that the object was seen about 30 minutes after pilot balloon sounding and rawinsonde release time. From the known releast points, wind direction and speed at the level mentioned, this object or objects could not possibly have been a weather balloon.

No. 182: No balloons released within 120 miles of this position, but if wind were from west it could have been a leaking balloon from Norfolk or Hatteras which was not rising as it should. However, the date of incident cannot be read from the questionnaire, hence no definite conclusion can be drawn.

No. 183: Purely a radar report. If this report is accurate, couldn't possibly be a balloon.

No. 184 - 185: Very controversial accounts of speed (0 - 3 times that of a Jet); description sounds like burning pilot balloon sounding with lantern. However, nearest release was two hours earlier at St. Cloud. Could have been this pilot balloon sounding assuming a leaky balloon to keep it at a low altitude. Not at all probable, but possibly a balloon.

No. 186: Object reported moving directly into headwind of 20K. Only possible weather balloon would have been moving SE from Salt Lake City. If speed is any criterion, this was definitely not a balloon.

No. 187: A heavenly body, Venus.

No. 188: No actual sighting; a radar report, if accurate, definitely no weather balloon.

No. 189: Rawinsondes released at Montgomery and Atlanta 1 1/2 hours earlier and would have been blown into sighted area by upper winds. Only a faulty balloon, however, could have descended to that low altitude. From description, balloon is most unlikely.

No. 190: Every indication seems to point to this object being a rawinsonde balloon. Rawinsonde scheduled to be released from Munich approximately one hour previous to sighting. Very light winds in Munich area. Definitely a balloon.

No. 191: Only balloon released in wind pattern that would carry it over Junction City was released at Dodge City approximately one hour before sighting time. If reported direction and speed of object were at all accurate, balloon not possible.

No. 192: Balloons released from St. Cloud and Duluth just prior to sighting. Wind perfect for carrying balloon ~~it~~ into observer's path. Wind

reported at 30K at about 80° to 110°. Steadily rising is also indicative of weather balloon.

No. 193: No date given; very little information; cannot determine object.

No. 194: Definite identity established by M.I.T.

No. 195: Very little information, only radar pipe; cannot determine if weather balloon or not.

No. 196: Radar scope observation only; object travelling directly into wind. Cannot determine if balloon, but unlikely.

No. 197: Almost certainly the comet discovered by the Sydney astronomer. No balloon could have reached Richmond at the time the object was sighted inasmuch as the sighting time and release time were almost simultaneous.

No. 198: No visual observation; radar blip moving at high speed and constantly changing direction. If radar report is accurate, couldn't possibly be a balloon.

No. 199: Wind, time and number of objects sighted rule out possibility of weather balloons.

No. 200: Definitely not weather balloon. Course southerly, wind almost due North at all levels. Only station releasing balloon in this area is North of Crescent City.

No. 201: Pilot balloon sounding released from Azores station at 0300 Z. Time of sight "about" that time. Description sounds very much like lighted pilot balloon sounding. Only discrepancy is speed which is reported from 25 M.P.H. to 800 M.P.H. If the lower speed is correct, object may be almost certainly assumed to be a weather balloon.

No. 202: Time of sighting was five hours after last scheduled release time for any rawin or pilot balloon sounding, thus discounting a balloon leak, would put it far too high for easy sighting. Definitely not a weather balloon.

No. 203: Again last scheduled release was over five hours prior to sighting. Only possibility, and a definitely unlikely one, is a lighted balloon falling in flames from an extremely high altitude.

No. 204: Venus.

No. 205: No date given on this, therefore, impossible to check wind flow pattern. Time, two hours after scheduled release time for Kansas City, Columbia, and St. Louis, Mo. balloons.

No. 206: If description is accurate, i.e., wings on fuselage, roar of engine, circling object, possibility of weather balloon is remote. Also, latest time of release for Clark Field was four hours prior to sighting. Also, note F.B.I. note on character of observer.

No. 207: Definitely not a weather balloon.

No. 208: Object sighted about four hours after last scheduled release time. Upper air flow pattern gives no indication of possibility of weather balloon drifting in from another station. Also balloon would have to have leaked to remain at 30,000 feet.

No. 209: Determined to have been twin-engined bomber.

No. 210: Summary sheet missing; no altitude given; time incompatible with scheduled balloon release times. If direction is correct, objects were flying into the wind. Cannot be determined conclusively. Inclined to believe objects were Jet aircraft.

No. 211: Very Pistol.

No. 212: Object sighted three hours after release time of Indianapolis and Ft. Wayne balloons. Defective balloon could have remained low enough to be seen and upper winds indicate that such a balloon would have been in the Dayton area at the time sighted. All other statements of observers seem to indicate that the object was a weather balloon.

No. 213: Evidently refers to the same object as in Incident No. 212, but with entirely different description which, if accurate, makes conclusion on No. 212 obviously incorrect. If not same object, certainly not a weather balloon, as definite pattern of motion, as described, not possible under existing wind flow conditions.

No. 214: No information whatsoever.

No. 215: Very high winds 60-70 M.P.H. from SW at all levels, definitely would have prohibited any balloon from making any southerly motion. Also, last scheduled released time was three hours prior to sighting at 1,000 feet. No time in sight given so cannot compute rate of climb to 20,000 feet. Fairly conclusive, not a balloon of any kind.

No. 216: Object reported moving directly into 70 M.P.H. head winds at an estimated 350 M.P.H. Observer is a professional weather observer and should know a weather balloon. Also, reported sighting was four hours after scheduled release time.

No. 217: Object reported moving into winds of 20-30K velocity and going faster than C-47 doing 150 M.P.H. The speed and direction are apparently very accurate since the C-47 was paralleling the object's course and several readings were made of the compass and air speed indicator. If report is true, definitely no balloon.

No. 218: No date given, consequently no check could be made of surface or upper-air data. As stated by observer, a flare is probable answer.

No. 219: Time of sighting coincides within a few minutes of the release time of the USAF rawinsonde at Newburgh and a pilot balloon sounding at New York. Very little description given that can be interpreted as either being a burning balloon or a meteor. One negative remark was that the object moved from East to West, an impossible situation for a balloon since winds at all levels were westerly.

No. 220: Wind at all levels W. to WNW; object reported flying directly into these winds. Also made definite turn from flying due North to North Northwest. Sighting time 4 1/4 hours after scheduled release times at Alameda, Sacramento and McClellan AFB.

No. 221: No information.

No. 222: Winds aloft charts not available on this one. Object sighted 2 1/2 hours after scheduled release time at which time it was plotted by a radar DF station to be at 27,000. A short time later the same station reported the object circling at 40,000; speed estimated at between 200-500 M.P.H. Most likely not a balloon.

No. 223: Definitely not a scheduled release balloon since it was seen to rise from the ground one hour before release time at Albuquerque and was seen by various persons as late as four hours after its original sighting. Seventeen individuals saw and reported this object as definitely a green flare. All commercial and governmental airfields were questioned concerning balloon releases with no success.

No. 224: Described exactly as that in No. 223, only at an altitude of 13,500 feet Mean Sea Level, 7,000 feet above the earth. Seen 2 1/2 hours after scheduled balloon release time. Wind at levels from 10,000 to 15,000 was WNW while flare was reported as travelling at very high speed in a NNW direction. Very accurate observation made by two F.B.I. agents. Definitely not a weather balloon.

No. 225: No date given. Object sighted within 15 minutes of release time of pilot balloon soundings at Albuquerque at low altitude, 500 feet. Exploded in red spray at 200 feet. This exact phenomena occurred on three different occasions at the same time which would seem to eliminate possibility of burning weather balloon.

No. 226: Sighted one hour after release at Albuquerque; same green flare appearance as in previous five or six cases, and moving into the wind from East to West. No balloon.

No. 227: Read report of incident; definitely not a weather balloon. Serves also as guide to interpreting Incidents 223, 224, 225, and 226.

No. 228: Case under investigation, no information.

No. 229: Case dropped.

No. 230: Exactly as described in 223, etc. Definitely no weather balloon.

No. 231: Another glowing green flare just as described above.

No. 232: Investigation dropped.

No. 233: Definitely no balloon; made turns, definite fuselage, accelerated from 200 M.P.H. to 400 M.P.H.

APPENDIX D

Dr. G. E. Valley

Some Considerations Affecting the Interpretation of Reports of Unidentified Flying Objects

SOME CONSIDERATIONS AFFECTING THE INTERPRETATION OF REPORTS OF UNIDENTIFIED FLYING OBJECTS.

By
G. E. Valley, Member Scientific Advisory Board,
Office of the Chief of Staff, United States Air Force.

The writer has studied summary abstracts and comments pertaining to unidentified flying objects, which were forwarded by Air Force Intelligence. These remarks are divided into three main parts: The first part is a short summary of the reports; the second part consists of a general survey of various possibilities of accounting for the reports; the third part contains certain recommendations for future action.

PART 1 SHORT SUMMARY OF OBSERVATIONS.

The reports can be grouped as follows:

Group 1. The most numerous reports indicate the daytime observation of metallic disk-like objects, roughly in diameter ten times their thickness. There is some suggestion that the cross section is assymetrical and rather like a turtle shell. Reports agree that these objects are capable of high acceleration and velocity; they often are sighted in groups, sometimes in formation. Sometimes they flutter.

Group 2. The second group consists of reports of lights observed at night. These are also capable of high speed and acceleration. They are less commonly seen in groups. They usually appear to be sharply defined luminous objects.

Group 3. The third group consists of reports of various kinds of rockets, in general appearing somewhat like V-2 rockets.

Group 4. The fourth group contains reports of various devices which, in the writer's opinion, are sounding balloons of unusual shape such as are made by the General Mills Company to Navy Contract.

Group 5. The fifth group includes reports of objects in which little credence can be placed.

General Remarks.

In general it is noted that few if any reports indicate that the observed objects make any noise or radio interference. Nor are there many indications of any material affects or physical damage attributable to the observed objects.

SUMMARY, PART 1.

This report will consider mainly the reports of Groups 1 and 2.

PART 2. ON POSSIBLE EXPLANATIONS OF THE REPORTS.

Section A. What can be deduced concerning the nature of an unknown aerial object from a single sighting.

Here there are two problems: first, how much can be deduced concerning the nature of the objects from geometrical calculations alone; second, how much more can be deduced if, in addition, it is assumed that the objects obey the laws of nature as we know them.

Concerning the first problem it can be stated that only ratios of lengths, and rates of change of such ratios can be accurately determined. Thus the range and size of such objects cannot be determined; and it is noticeable that reports of size of the observed objects are widely at variance. However, angles, such as the angle subtended by the object, can be observed. Likewise there is fair agreement among several observers that the diameter of the objects of Group 1 is about ten times their thickness. Although velocity cannot be determined, angular velocity can be, and in particular the flutter frequency could, in principle, be determined.

All that can be concluded about the range and size of the objects, from geometrical considerations alone, is: 1) from the fact that estimated

sizes vary so widely, the objects were actually either of different sizes, or more likely, that they were far enough from the observers so that binocular vision produced no stereoscopic effect; this only means that they were farther off than about thirty feet; 2) since objects were seen to disappear behind trees, buildings, clouds etc, they are large enough to be visible at the ranges of those recognizable objects.

Now it is obviously of prime importance to estimate the size and mass of the observed objects. This may be possible to some extent if it is permissable to assume that they obey the laws of physics. Since the objects have not been observed to produce any physical effects, other than the one case in which a cloud was evaporated along the trajectory, it is not certain that the laws of mechanics, for instance, would be sufficient.

But suppose that mechanical laws alone are sufficient. Then the following example is sufficient proof that at least a length could, in principle, be determined: suppose a simple pendulum were observed suspended in the sky; then after observing its frequency of oscillation, we could deduce from the laws of mechanics its precise length.

This suggests that something could be deduced from the observed fluttering motion of some of the objects of Group 1. Assume that we know the angular frequency and angular amplitude of this fluttering motion (they can be measured in principle from a motion picture). Then for purposes of calculation assume the object to be thirty feet in diameter, to be as rigid as a normal aircraft wing of 30 foot span, to be constructed of material of the optimum weight-strength ratio and to be a structure of most efficient design. It is now possible to calculate how heavy the object must be merely to remain rigid under the observed angular motion. Let the caluclation be made for a plurality of assumed sizes 1, 2, 4, 8, 16, 32, 64 ----- up to say

200 feet, and let calculated mass be plotted versus assured size. The non-linear character of the curve should indicate an approximate upper limit to the size of the object.

If in addition, it is assumed that the flutter is due to aerodynamic forces, it is possible that more precise information could be obtained.

The required angular data can probably be extracted from witnesses most reliably by the use of a demonstration model which can be made to oscillate or flutter in a known way.

SUMMARY, PART 2, SECTION A.

Geometrical calculations alone cannot yield the size of objects observed from a single station; such observation, together with the assumption that the objects are essentially aircraft, can be used to set reasonable limits of size.

PART II, SECTION B. THE POSSIBILITY OF SUPPORTING AND PROPELLING A SOLID OBJECT BY UNUSUAL MEANS.

Since some observers have obviously colored their reports with talk of rays, jets, beams, space-ships, and the like, it is well to examine what possibilities exist along these lines. This is also important in view of the conclusions of Part II, Section A. of this report.

METHOD I. Propulsion and support by means of "rays" or "beams".

By "rays" or "beams" are meant either purely electromagnetic radiation or else radiation which is largely corpuscular like cathode-rays or cosmic-rays or cyclotron-beams.

Now it is obvious that any device propelled or supported by such means is fundamentally a reaction device. It is fundamental in the theory of such devices that a given amount of energy is most efficiently spent if the momentum thrown back or down is large. This means that a large mass should

be given a small acceleration - a theorem well understood by helicopter designers.

The beams or rays mentioned do the contrary - a small mass is given a very high velocity - consequently enormous powers - greater than the total world's power capacity - would be needed to support even the smallest object by such means.

METHOD II. Direct use of Earth's Magnetic Field.

One observer (incident 68) noticed a violent motion of a hand-held compass. If we assume from this that the objects produced a magnetic field, comparable with the Earth's field, namely 0.1 gauss, and that the observer found that the object subtended an angle θ at his position, then the ampereturns of the required electromagnet is given by

$ni = \frac{30\ R}{\theta^2}$ where R is the range of the object.

For instance, if R is one kilometer and the object is 10 meters in diameter, then ni = 1 billion ampere-turns.

Now if the object were actually only 10 meters away and were correspondingly smaller, namely 10 cm in diameter, it would still require 10 million ampere-turns.

These figures are a little in excess of what can be conveniently done on the ground. They make it seem unlikely that the effect was actually observed.

Now the Earth's magnetic field would react on such a magnet to produce not only a torque but also a force. This force depends not directly on the Earth's field intensity but on its irregularity or gradient. This force is obviously minute since the change in field over a distance of 10 meters (assumed diameter of the object) is scarcely measurable - moreover the gradient is not predictable but changes due to local ore deposits.

Thus even if the effect were large enough to use it would still be unreliable and unpredictable.

METHOD III. Support of an Electrically Charged Object by Causing It to Move Transverse to the Earth's Magnetic Field.

A positively charged body moving from West to East, or a negatively charged body moving from East to West will experience an upward force due to the Earth's magnetic field.

A sphere 10 meters diameter moving at a speed of one kilometer/second would experience an upward force of one pound at the equator if charged to a potential of 5×10^{12} volts. This is obviously ridiculous.

SECTION D. THE ANTI GRAVITY SHIELD.

It has been proposed, by various writers, perhaps first by H. G. Wells, that it might be possible to construct a means of shielding a massive body from the influence of gravity. Such an object would then float. Recently there appeared in the press a notice that a prominent economist has offered to support research on such an enterprise.

Obviously, conservation of energy demands that considerable energy be given the supported object in order to place it on the shield. However this amount of energy is in no way prohibitive, and furthermore it can be gotten back when the object lands.

Aside from the fact that we have no suggestions as to how such a device is to be made, the various theories of general relativity all agree in assuming that gravitational force and force due to acceleration are indistinguishable, and from this assumption the theories predict certain effects which are in fact observed. The assumption therefore is probably correct, and a corollary of it is essentially that only by means of an acceleration can gravity be counteracted. This we can successfully do

for instance by making an artificial satelite - but this presumably is not what has been observed.

SUMMARY, PART II, SECTION B.

Several unorthodox means of supporting or propelling a solid object have been considered - all are impracticable. This finding lends credence to the tentative proposed assumption of Part II, that the objects are supported and propelled by some normal means, or else that they are not solids. No discussion of the type of Part II, Section B can, in principle, of course, be complete.

PART II, SECTION C. POSSIBLE CAUSES FOR THE REPORTS.

CLASSIFICATION I. NATURAL TERRESTRIAL PHENOMENA.

1) The observations may be due to some effect such as ball lightning. The writer has no suggestions on this essentially meteorological subject.

2) The objects may be some kind of animal.

Even in the celebrated case of incident 172 where the light was chased by a P51 for half an hour and which was reported by the pilot to be intelligently directed, we can make this remark. For consider that an intelligence capable of making so remarkable device would not be likely to play around in so idle a manner as described by the pilot.

In this connection it would be well to examine if some of the lights observed at night were not fire-flies.

3) The observed objects may be hallucinatory or psychological in origin.

It is of prime importance to study this possibility because we can learn from it something of the character of the population; its response under attack; and also something about the reliability of visual observation.

One would like to assume that the positions held by many of the re-

ported observers guarantee their observations. Unfortunately there were many reports of curious phenomena by pilots during the war - the incident of the fire-ball fighters comes to mind. Further, mariners have been reporting sea-serpents for hundreds of years yet no one has yet produced a photograph.

It would be interesting to tabulate the responses to see how reliable were the reports on the Japanese balloons during the war. There we had a phenomenon proven to be real.

It is interesting that the reports swiftly reach a maximum frequency during the end of June 1947 and then slowly taper off. We can assume that this is actually an indication of how many objects were actually about, or, quite differently, we can take this frequency curve as indicating something about mass psychology.

This point can be tested. Suppose the population is momentarily excited; how does the frequency of reports vary with time? A study of crank letters received after the recent publicity given to the satelite program should give the required frequency distribution.

It is probably necessary but certainly not sufficient that the unidentified object curve and the crank-letter curve should be similar in order for the flying disks to be classed as hallucinations.

A large scale experiment was made at the time of Orson Welles's "Martian" broadcast. Some records of this must persist in newspaper files.

CLASSIFICATION II. MAN-MADE TERRESTRIAL PHENOMENA.

1) The objects may be Russian aircraft. If this were so, then the considerations of Sections A and B indicate that we would have plenty to worry about. It is the author's opinion that only an accidental discovery

of a degree of novelty never before achieved could suffice to explain such devices. It is doubtful whether a potential enemy would arouse our curiosity in so idle a fashion.

CLASSIFICATION III. EXTRA TERRESTRIAL OBJECTS.

1) Meteors: It is noteworthy that the British physicist Lovell writing in "Physics Today" mentions the radar discovery of a new daytime meteorite stream which reached its maximum during June 1947. The reported objects lose little of their interest however if they are of meteoritic origin.

2) Animals. Although the objects as described act more like animals than anything else, there are few reliable reports on extra-terrestrial animals.

3) Space Ships. The following considerations pertain:

a) If there is an extra terrestrial civilization which can make such objects as are reported then it is most probable that its development is far in advance of ours. This argument can be supported on probability arguments alone without recourse to astronomical hypotheses.

b) Such a civilization might observe that on Earth we now have atomic bombs and are fast developing rockets. In view of the past history of mankind they should be alarmed. We should therefore expect at this time above all to behold such visitations.

Since the acts of mankind most easily observed from a distance are A-bomb explosions we should expect some relation to obtain between the time of A-bomb explosions, the time at which the space ships are seen, and the time required for such ships to arrive from and return to home-base.

PART III. RECOMMENDATIONS.

1) The file should be continued.

2) A meteorologist should compute the approximate energy required to

evaporate as much cloud as shown in the incident 26 photographs. Together with an aerodynamicist he should examine whether a meteorite of unusual shape could move as observed.

3) The calculations suggested in Part II, Section A, should be estimated by an aerodynamicist with such changes as his more-detailed knowledge may suggest.

4) The mass-psychology studies outlined in Part II, Section C, Classification I 3 should be carried out by a competent staff of statisticians and mass-psychologists.

5) Interviewing agents should carry objects or moving pictures for comparison with reporter's memories. These devices should be properly designed by a psychologist experienced in problems pertaining to aircraft and design of aircraft control equipment so that he shall have some grasp of what it is that is to be found out. If the Air Force has reason to be seriously interested in these reports it should take immediate steps to interrogate the reporters more precisely.

6) A person skilled in the optics of the eye and of the atmosphere should investigate the particular point that several reports agree in describing the objects as being about ten times as wide as they are thick; the point being to see if there is a plurality of actual shapes which appear so under conditions approaching limiting resolution or detectable contrast.

APPENDIX E-1

Bard Corporation

Letter, dated 29 March 1947

The RAND Corporation

1500 Fourth St - Santa Monica - California

29 March 1949 L-2563

Lieutenant Colonel H. J. Demstreet
Technical Intelligence Division
Air Material Command
Wright-Patterson Field
Dayton, Ohio

Dear Colonel Demstreet:

In reply to your inquiry of March 24th, we had not planned to issue a formal report on Project Grudge until or unless our study leads to some unusual or unexpected finding which would throw new light on Grudge.

We are now working through the data in search of significant consistencies or other indirect bits of evidence. It is expected that we shall have explored all our various avenues of attack in about two months. To date we have found nothing which would seriously controvert simple rational explanations of the various phenomena in terms of balloons, conventional aircraft, planets, meteors, bits of paper, optical illusions, practical jokers, psychopathological reporters, and the like.

We should like to take this opportunity to raise a few questions: (1) The file on Incident 50 contains a photograph which apparently belongs with incident 40. Is this surmise correct? (2) The file on incident 162 was omitted from the data. Why? (3) We have heard from a reliable source of an incident in which fishermen observed flying objects which dropped hot material which they collected and subsequently gave to official investigators. The investigators' plane crashed but there was a survivor. We do not seem to have a file or this incident - certainly not a complete file. May we have one?

Sincerely yours,

/s/ A. M. Mood
A. M. Mood

AMM:rb

APPENDIX B-2

Wood Corporation (J. E. Lipp)

Space Ship Considerations

13 December 1948 AI-1009

Brigadier General Putt
United States Air Force
Director of Research and Development
Office, Deputy Chief of Staff, Materiel
Washington 25, D. C.

Dear General Putt:

Please refer to your letter of 18 November 1948 relative to the "flying object" problem and to Mr. Collbohm's reply dated 24 November 1948. In paragraph (b) of the reply, Mr. Collbohm promised (among other things) to send a discussion of the "special design and performance characteristics that are believed to distinguish space ships."

This present letter gives, in very general terms, a description of the likelihood of a visit from other worlds as an engineering problem and some points regarding the use of space vehicles as compared with descriptions of the flying objects. Mr. Collbohm will deliver copies to Colonel McCoy at Wright-Patterson Air Base during the RAND briefing there within the next few days.

A good beginning is to discuss some possible places of origin of visiting space ships. Astronomers are largely in agreement that only one member of the Solar system (besides Earth) can support higher forms of life. It is the planet Mars. Even Mars appears quite desolate and inhospitable so that a race would be more occupied with survival than we are on Earth. Reference 1 gives adequate descriptions of conditions on the various planets and satellites. A quotation from Ref. 1 (p. 229) can well be included here.

> "Whether intelligent beings exist to appreciate these splendors of the Martian landscape is pure speculation. If we have correctly reconstructed the history of Mars, there is little reason to believe that the life processes may not have followed a course similar to terrestrial evolution. With this assumption, three general possibilities emerge. Intelligent beings may have protected themselves against the excessively slow loss of atmosphere, oxygen and water, by constructing homes and cities* with the physical conditions scientifically con-

*"Not too large or they might be visible. Perhaps underground, where the atmospheric pressure would be greater and where the temperature extremes would be reduced."

trolled. As a second possibility, evolution may have developed a being who can withstand the rigors of the Martian climate. Or the race may have perished.

"These possibilities have been sufficiently expanded in the pseudo-scientific literature to make further amplification superfluous. However, there may exist some interesting restrictions to the anatomy and physiology of a Martian. Rarity of the atmosphere, for example, may require a completely altered respiratory system for warm-blooded creatures. If the atmospheric pressure is much below the vapor pressure of water at the body temperature of the individual, the process of breathing with our type of lungs becomes impossible. On Mars the critical pressure for a body temperature of 98.6°F. occurs when a column of the atmosphere contains one sixth the mass of a similar column on the Earth. For a body temperature of 77°F. the critical mass ratio is reduced to about one twelfth, and at 60°F. to about one twenty-fourth. These critical values are of the same order as the values estimated for the Martian atmosphere. Accordingly the anatomy and physiology of a Martian may be radically different from ours - but this is all conjecture.

"We do not know the origin of life, even on the Earth. We are unable to observe any signs of intelligent life on Mars. The reader may form his own opinion. If he believes that the life force is universal and that intelligent beings may have once developed on Mars, he has only to imagine that they persisted for countless generations in a rare atmosphere which is nearly devoid of oxygen and water, and on a planet where the nights are much colder than our arctic winters. The existence of intelligent life on Mars is not impossible but it is completely unproven."

It is not too unreasonable to go a step further and consider Venus as a possible home for intelligent life. The atmosphere, to be sure, apparently consists mostly of carbon dioxide with deep clouds of formaldehyde droplets, and there seems to be little or no water. Yet living organisms might develop in chemical environments that are strange to us: the vegetable kingdom, for example, operates on a fundamentally different energy cycle from Man. Bodies might be constructed and operated with different chemicals and other physical principles than any of the creatures we know. One thing is evident: fishes, insects, and mammals all manufacture within their own bodies complex chemical compounds that do not exist as minerals. To this extent, life is self-sufficient and might well adapt itself to any environment within certain limits of temperature (and size of creature).

Venus has two handicaps relative to Mars. Her mass, and gravity, are nearly as large as for the Earth (Mars is smaller) and her

cloudy atmosphere would obscure astronomy, hence space travel. The remaining Solar planets are such poor prospects that they can be ignored.

In the next few paragraphs, we shall speak of Mars. It should be understood that most of the remarks apply equally well to Venus.

Various people have suggested that an advanced race may have been visiting Earth from Mars or Venus at intervals from decades to eons. Reports of objects in the sky seem to have been handed down through the generations. If this were true, a race of such knowledge and power would have established some form of direct contact. They could see that Earth's inhabitants would be helpless to do interplanetary harm. If afraid of carrying diseases home, they would at least try to communicate. It is hard to believe that any technically accomplished race would come here, flaunt its ability in mysterious ways and then simply go away. To this writer, long-time practice of space travel implies advanced engineering and science, weapons and ways of thinking. It is not plausible (as many fiction writers do) to mix space ships with broadswords. Furthermore, a race which had enough initiative to explore among the planets would hardly be too timid to follow through when the job was accomplished.

One other hypothesis needs to be discussed. It is that the Martians have kept a long-term routine watch on Earth and have been alarmed by the sight of our A-bomb shots as evidence that we are warlike and on the threshold of space travel. (Venus is eliminated here because her cloudy atmosphere would make such a survey impractical). The first flying objects were sighted in the Spring of 1947, after a total 5 atomic bomb explosions, i.e., Alamogordo, Hiroshima, Nagasaki, Crossroads A and Crossroads B. Of these, the first two were in positions to be seen from Mars, the third was very doubtful (at the edge of Earth's disc in daylight) and the last two were on the wrong side of Earth. It is likely that Martian astronomers, with their thin atmosphere, could build telescopes big enough to see A-bomb explosions on Earth, even though we were 165 and 153 million miles away, respectively, on the Alamogordo and Hiroshima dates. The weakest point in the hypothesis is that a continual, defensive watch of Earth for long periods of time (perhaps thousands of years) would be dull sport, and no race that even remotely resembled Man would undertake it. We haven't even considered the idea for Venus or Mars, for example.

The sum and substance of this discussion is that if Martians are now visiting us without contact, it can be assumed that they have just recently succeeded in space travel and that their civilization would be practically abreast of ours.

The chance that Martians, under such widely divergent conditions, would have a civilization resembling our own is extremely remote. It is particularly unlikely that their civilization would be within a half century of our own state of advancement. Yet in the last 50 years we have just started to use aircraft and in the next 50 years we will almost certainly start exploring space.

Thus it appears that space travel from another point within the Solar system is possible but very unlikely. Odds are at least a thousand-to-one against it.

This leaves the totality of planets of other stars in the Galaxy as possible sources. Many modern astronomers believe that planets are fairly normal and logical affairs in the life history of a star (rather than cataclysmic oddities) so that many planets can be expected to exist in space.

To narrow the field a little, some loose specifications can be written for the star about which the home base planet would revolve. Let us say that the star should bear a family resemblance to the Sun, which is a member of the so-called "main-sequence" of stars, i.e., we eliminate white dwarfs, red giants and supergiants. For a description of these types, see reference 2, chapter 5. There is no specific reason for making this assumption except to simplify discussion: we are still considering the majority of stars.

Next, true variable stars can be eliminated, since conditions on a planet attached to a variable star would fluctuate too wildly to permit life. The number of stars deleted here is negligibly small. Reference 3, pages 76 and 85 indicate that the most common types are too bright to be in nearby space unnoticed. Lastly, we shall omit binary or multiple stars, since the conditions for stable planet orbits are obscure in such cases. About a third of the stars are eliminated by this restriction.

As our best known sample of space we can take a volume with the Sun at the center and a radius of 16 light years. A compilation of the 47 known stars, including the Sun, within this volume is given in reference 4, pages 52 to 57. Eliminating according to the above discussion: Three are white dwarfs, eight binaries account for 16 stars and two trinaries account for 6 more. The remainder, 22 stars, can be considered as eligible for habitable planets.

Assuming the above volume to be typical, the contents of any other reasonable volume can be found by varying the number of stars proportionately with the volume, or with the radius cubed, $S_e = 22 \times (\frac{r}{16})^3$, where S_e is number of eligible stars and r is the radius of the volume in light years. (This formula should only be used for radii greater than 16 light years. For smaller samples we call for a recount. For example, only one known eligible star other than the Sun lies within eight light years).

Having an estimate of the number of useable stars, it is now necessary to make a guess as to the number of habitable planets. We have only one observed sample, the Solar System, and the guess must be made with low confidence, since intelligent life may not be randomly distributed at all.

The Sun has nine planets, arranged in a fairly regular progression of orbits (see reference 1, Appendix I) that lends credence to theories that many stars have planets. Of the nine planets, (one, the Earth) is completely suitable for life. Two more (in adjacent orbits) are near misses: Mars has extremely rigorous living conditions and Venus has an unsuitable atmosphere. Viewed very broadly indeed, this could mean that each star would have a series of planets so spaced that one, or possibly two, would have correct temperatures, correct moisture content and atmosphere to support civilized life. Let us assume that there is, on the average, one habitable planet per eligible star.

There is no line of reasoning or evidence which can indicate whether life will actually develop on a planet where the conditions are suitable. Here again, the Earth may be unique rather than a random sample. This writer can only inject some personal intuition into the discussion with the view that life is not unique on Earth, or even the random result of a low probability, but is practically inevitable in the right conditions. This is to say, the number of inhabited planets is equal to those that are suitable!

One more item needs to be considered. Knowing nothing at all about other races, we must assume that Man is average as to technical advancement, environmental difficulties, etc. That is, one half of the other planets are behind us and have no space travel and the other half are ahead and have various levels of space travel. We can thus imagine that in our sample volume there are 11 races of beings who have begun space explorations. The formula on page 3 above now becomes

$$R = 11 \times (\frac{r}{16})^3$$

where R is the number of races exploring space in a spherical volume of radius $r \geq 16$ light years.

Arguments like those applied to Martians on page 2 need not apply to races from other star systems. Instead of being a first port of call, Earth would possibly be reached only after many centuries of development and exploration with space ships, so that a visiting race would be expected to be far in advance of Man.

To summarize the discussion thus far: the chance of space travelers existing at planets attached to neighboring stars is very much greater than the chance of space-traveling Martians. The one can be viewed almost as a certainty (if the assumptions are accepted), whereas the other is very slight indeed.

In order to estimate the relative chances that visitors from Mars or star X could come to the Earth and act like "flying objects", some discussion of characteristics of space ships is necessary.

To handle the simple case first, a trip from Mars to Earth should be feasible using a rocket-powered vehicle. Once here, the rocket would probably use more fuel in slowing down for a landing than it did in initial takeoff, due to Earth's higher gravitational force.

A rough estimate of one-way performance can be found by adding the so-called "escape velocity" of Mars to that of the Earth plus the total energy change (kinetic and potential) used in changing from one planetary orbit to the other. These are 3.1, 7.0, and 10.7 miles per second, respectively, giving a total required performance of 20.8 miles per second for a one-way flight. Barring a suicide mission, the vehicle would have to land and replenish or else carry a 100% reserve for the trip home.

Let us assume the Martians have developed a nuclear, hydrogen-propelled vehicle (the most efficient basic arrangement that has been conceived here on Earth) which uses half its stages to get here and the remaining stages to return to Mars, thus completing a round trip without refueling, but slowing down enough in our atmosphere to be easily visible (i.e., practically making a landing). Since it is nuclear powered, gas temperatures will be limited to the maximum operating temperatures that materials can withstand (heat must transfer from the pile to the gas, so cooling can't be used in the pile). The highest melting point compound of uranium which we can find is uranium carbide. It has a melting point of 4560°R. Assume the Martians are capable of realizing a gas temperature of 4500°R (= 2500°K), and that they also have alloys which make high motor pressures (3000 psi) economical. Then the specific impulse will be I = 1035 seconds and the exhaust velocity will be c = 33,400 ft/sec (reference 5). Calculation shows that using a single stage for each leg of the journey would require a fuel/gross weight ratio of 0.96 (for each stage) too high to be practical. Using two stages each way (four altogether) brings the required fuel ratio down to .81, a value that can be realized.

If, by the development of strong alloys, the basic weight could be kept to 10% of the total weight for each stage, a residue of 9% could be used for payload. A four stage vehicle would then have a gross weight $\frac{(100)^4}{9}$ = 15,000 times as great as the payload: thus, if the payload were 2,000 pounds, the gross weight would be 30 million pounds at initial takeoff (Earth pounds).

Of course, if we allow the Martians to refuel, the vehicle could have only two stages* and the gross weight would be only $(\frac{100}{9})^2 = 123$ times the payload, i.e., 250,000 pounds. This would require bringing electrolytic and refrigerating equipment and sitting at the South Pole long enough to extract fuel for the hourney home, since they have not asked us for supplies. Our oceans (electrolysis to make H_2) would be obvious to Martian telescopes and they might conceivably follow such a plan, particularly if they came here without foreknowledge that Earth has a civilization.

Requirements for a trip from a planet attached to some star other than the Sun can be calculated in a similar manner. Here the energy (or velocity) required has more parts: (a) escape from the planet (b) escape from the star (c) enough velocity to traverse a few light years of space in reasonable time (d) deceleration toward the Sun (e) deceleration toward the Earth. The nearest "eligible" star is an object called Wolf 359 (see reference 4, p 52), at a distance of 8.0 light years. It is small, having an absolute magnitude of 16.6 and is typical of "red dwarfs" which make up more than half of the eligible populations. By comparison with similar stars of known mass, this star is estimated to have a mass roughly 0.03 as great as the sun. Since the star has a low luminosity (being much cooler and smaller than the Sun) a habitable planet would need to be in a small orbit for warmth.

Of the changes of energy required as listed in the preceding paragraph, item (c), velocity to traverse intervening space, is so large as to make the others completely negligible. If the visitors were long lived and could "hibernate" for 90 years both coming and going, then 1/10 the speed of light would be required, i.e., the enormous velocity of 18,000 miles per second. This is completely beyond the reach of any predicted level of rocket propulsion.

If a race were far enough advanced to make really efficient use of nuclear energy, then a large part of the mass of the nuclear material might be converted into jet energy. We have no idea how to do this, in fact reference 6 indicates that the materials required to withstand the temperatures, etc., may be fundamentally unattainable. Let us start from a jet-propellant-to-gross-weight ratio of .75. If the total amount of expended material (nuclear plus propellent) can be .85 of the gross weight, then the nuclear material expended can be 0.10 of the gross. Using an efficiency of 0.5 for converting nuclear energy to jet energy and neglecting relativistic mass corrections, then a rocket velocity of half the velocity of light could be attained. This would mean a transit time of 16 years each way from the star Wolf 359, or longer times from other eligible stars. To try to go much faster would mean spending much energy on relativistic change in mass and therefore operating at lowered efficiency.

---

* Actually three stages. On the trip to Earth, the first stage would be filled with fuel, the second stage would contain partial fuel, the third would be empty. The first stage would be thrown away during flight. On the trip back to Mars, the second and third stages would be filled with fuel. The gross weight of the initial vehicle would be of the order of magnitude of a two-stage rocket.

To summarize this section of the discussion, it can be said that a trip from Mars is a logical engineering advance over our own present technical status, but that a trip from another star system requires improvements of propulsion that we have not yet conceived.

Combining the efforts of all the science-fiction-writers, we could conjure up a large number of hypothetical methods of transportation like gravity shields, space overdrives, teleports, simulators, energy beams and so on. Conceivably, among the myriads of stellar systems in the Galaxy, one or more races have discovered methods of travel that would be fantastic by our standards. Yet the larger the volume of space that must be included in order to strengthen this possibility, the lower will be the chance that the race involved would ever find the earth. The Galaxy has a diameter of roughly 100,000 light years and a total mass about two hundred billion times that of the Sun (reference 4). Other galaxies have been photographed and estimated in numbers of several hundred million (reference 2, p. 4) at distances up to billions of light years (reference 7, p 158). The number of stars in the known universe is enormous, yet so are the distances involved. A super-race (unless they occur frequently) would not be likely to stumble upon Planet III of Sol, a fifth-magnitude star in the rarefied outskirts of the Galaxy.

A description of the probable operating characteristics of space ships must be based on the assumption that they will be rockets, since this is the only form of propulsion that we know will function in outer space. Below are listed a few of the significant factors of rocketry in relation to the "flying objects".

(a) Maneuverability. A special-purpose rocket can be made as maneuverable as we like, with very high accelerations either along or normal to the flight path. However, a high-performance space ship will certainly be large and unwieldy and could hardly be designed to maneuver frivolously around in the Earth's atmosphere. The only economical maneuver would be to come down and go up more or less vertically.

(b) Fuel reserves. It is hard to see how a single rocket ship could carry enough extra fuel to make repeated descents into the Earth's atmosphere. The large number of flying objects reported in quick succession could only mean a large number of visiting craft.

Two possibilities thus are presented. First, a number of space ships could have come as a group. This would only be done if full-dress contact were to be established. Second, numerous small craft might descend from a mother ship which coasts around the Earth in a satellite orbit. But this could mean that the smaller craft would have to be rockets of satellite performance, and to contain them the mother ship would have to be truly enormous.

(c) Appearance. A vertically descending rocket might well appear as a luminous disk to a person directly below. Observers at a distance, however, would surely identify the rocket for what it really is. There would probably be more reports of oblique views than of end-on views. Of course, the shape need not be typical of our rockets; yet the exhaust should be easy to see.

One or two additional general remarks may be relevant to space ships as "flying objects". The distribution of flying objects is peculiar, to say the least. As far as this writer knows, all incidents have occurred within the United States, whereas visiting spacemen could be expected to scatter their visits more or less uniformly over the globe. The small area covered indicates strongly that the flying objects are of Earthly origin, whether physical or psychological.

The lack of purpose apparent in the various episodes is also puzzling. Only one motive can be assigned; that the space-men are "feeling out" our defenses without wanting to be belligerent. If so, they must have been satisfied long ago that we can't catch them. It seems fruitless for them to keep repeating the same experiment.

Conclusions:

Although visits from outer space are believed to be possible, they are believed to be very improbable. In particular, the actions attributed to the "flying objects" reported during 1947 and 1948 seem inconsistent with the requirements for space travel.

Very truly yours,

J. E. Lipp
Missiles Division

JEL:sp

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APPENDIX F

3610th Electronics Station

Analysis of Project Bridge Reports

AIR MATERIEL COMMAND
3160 Electronics Station
Cambridge Field Station
230 Albany Street
Cambridge 39, Mass.

ACT/Be

000.92
In reply address both communication and envelope to the Commanding Officer and attention of following office symbol. ERH

April 18, 1949

SUBJECT: Analysis of Project "Grudge" Reported Incidents

TO: Commanding General
Air Materiel Command
Wright-Patterson Air Force Base
Dayton, Ohio
ATTN: MCIAXO

1. Reference is made to the letters from your Headquarters to this station of 22 November 1948, 6 December 1948, and 14 January 1949, Subjects: "Project 'Sign' ", requesting that reported incidents 1 through 172 be analysed to determine whether or not these might have been caused by balloons launched by these laboratories.

2. A listing has been compiled of all balloons launched by these laboratories and its contractors for special atmospheric research purposes, from the first such launching to No. 101 on 17 November 1948. Each of these launchings has been compared with the reported incidents 1 through 172. Factors of comparison were date of launching and date of recovery with respect to date of reported incidents; place of launching and place of recovery with respect to the place of reported incidents, and possible deviations from the known flight path with respect to the place of reported incidents. So that your office may make an independent analysis, three copies of the launching list are inclosed.

a. Incidents No. 5 through No. 16 reported on 4 July 1947 throughout Oregon, Idaho and Washington gave, in general, descriptions of clusters or groups of objects. The 3 July 1947 balloon launching No. 8 at Alamogordo was a cluster of balloons and was not recovered, and so might be suspected of being the cause of these reports. However, although not recovered, this flight was terminated in the New Mexico Tularosa Valley only a few miles northwest of Alamogordo. That the balloons were downed was determined both by airplane spotting and by radio direction finding upon the balloon telemetering instruments. Recovery of the balloons and instruments was prevented by the impassability of the terrain.

b. Balloon release No. 11 of 7 July 1947 could compare with respect to date with incident No. 1 through No. 4, and again with incident No. 40. This balloon flight was again a cluster.

[redacted]

The description of incident No. 40 is inconsistent with the appearance of balloon flight No. 11. Also, in consideration of the prevailing upper winds, it is very unlikely that the balloons would have gone more than a few miles westward of Alamogordo, although it must be admitted that a long flight west of the launching point could not be ruled out as impossible.

c. Incident No. 47 compares somewhat in time with balloon Launching No. 10 of 5 July 1947. However, balloon No. 10 although not recovered was known to have been downed northeast of Albuquerque, New Mexico. It was not recovered due to impassability of terrain. Incident No. 113 is a reasonable description of the 20 ft. plastic balloon and instruments used by these Laboratories. This incident was on the date of balloon release No. 46 of 9 April 1948 at Alamogordo. However, the time of the reported incident (1506 CST) is about 1/2 hour before the time of balloon release (1432 MST), thus the incident could not have been that balloon.

d. It is of interest to note that incident No. 122 was reported by an employee of these Laboratories who had considerable experience in the use of balloons of all kinds, and could have been depended upon to know the appearance and behavior of a balloon if it was this he saw.

e. Incident No. 163 bears a fair description of the appearance of a large plastic balloon in sunset light. The object's disappearance could be accounted for either by its movement into the earth's sunset shadow or by natural defocusing of the observer's eyes. This incident could possibly have been balloon release No. 75 or No. 76 or 20 and 21 July 48 from Alamogordo. Balloon No. 75 was recovered at Hollister, California, which is in the Monterey Bay area, on 22 July 1948 and could have easily had a trajectory which would have been within sight of the Los Angeles area. Balloon No. 76 was never recovered. It is possible that it had a trajectory similar to No. 75.

f. All other reported incidents from 1 to 172 do not seem to have reasonable comparison with balloons launched by these Laboratories.

3. The balloons used by these Laboratories are now somewhat standardized. They are 20 feet long, plastic, white in color, and hemisphere-on-cone in shape. Nearly all launchings are made at the Holloman AFB at Alamogordo, New Mexico. Two photograph prints are inclosed showing the appearance and size of these balloons. The larger photograph shows the typical flight appearance at any altitudes where it would be visible. It is hoped that this information may be of some use to you in identifying future reports of incidents.

4. It is believed that certain of the items in the questionnaire "Checklist-Unidentified Flying Objects" produce insignificant and unreliable data from an observer. These are: 9. Distance of object from observer; 11. Altitude; 12. Speed; and 16. Size. For any unfamiliar object beyond the focal range of the human eyes (about 60 ft.), these four factors are mutually inter-dependent and therefore indeterminant unless at least one of them (and some observed angles) are known. Directly asking an observer about these indeterminants not only gets unreliable data but induces wild answers because the observer is led into making a statement about quantities for which he has no basis in fact. He will unconsciously assume knowledge of some one of these factors and so give incorrect information on all. That people (many of whom should know better) will arbitrarily give answers to two significant figures on these questions, which really cannot be answered at all, is proof of the unreliability of their information.

5. It is suggested that these four items on the questionnaire be replaced by questions which will yield answers possible of being independent facts in terms of the observer's best estimates of angles and time. From such data given by observers of the same object at two different places, a reliable calculated estimate could be made of the object's size, altitude, speed and path. These data should include:

a. An estimate of the angular size of the object. A quick but reasonable estimate can be made by comparing the angle subtended by the index finger held at arms length. The finger (7/8" wide) of an average man held at 26" to 30" (arms length) will subtend an angle of approximately two degrees. In this way angular size from about 1/2° to about 8° can be estimated.

b. The range of the object's flight in terms of the angle subtended by the observed path. If the object moves in a reasonably straight course it is important to observe the position at the beginning and the end of its course. After the flight has been completed a person can extend his arms toward the two points and also at 90° or 180° and by comparison estimate the angular extent of the flight. It is also important that information which will determine those directions relative to a compass point be given. If the angular course is associated with objects on the horizon, with roads, with the sun (if the time of day is also noted) or by the north star, the orientation can be rechecked at any later time.

c. The time required for the object to traverse the observed course. This is probably the most difficult estimate to make. Timing with a watch is the most satisfactory, but an observer is seldom prepared to do so. Seconds can be counted with good accuracy by saying,

"one flying saucer; two flying saucers, three flying saucers" ---etc. At a normal speaking speed. On the other hand it is not easy to count seconds and at the same time make all the other desirable observations. It must be remembered that when a person is excited his estimates of time are apt to be rather inaccurate.

d. Estimation of the elevation angle of the object. Almost all persons will overestimate elevation angles. This tendency can be reduced by the observer extending one arm vertically and the other horizontally to observe a 90° angle. The vertical arm can then be lowered to point to the observed object. In this way the observed angle can be compared with a 90° angle and a more accurate estimate obtained.

6. It is realised that it might not be possible for an observer to perform the opeations suggested in the preceding paragraph, during the period the object is sighted. If he would immediately reconsider what he saw and then estimate such measurements, he should be able to give quantitative answers accurate to at least 25%. In interrogating observers, they should also be asked to reconstruct their observations and then estimate these same factors. It is suggested that instructions for making such quick and estimated observations be given to weather observers, control tower operators, civil police, forest and fire rangers, and other such people who might have good chance of seeing unidentified flying objects. If any information concerning unidentified flying objects is given to the public, instructions for reliable observation should be included.

7. This organization will be pleased to be of any further assistance required in connection with this matter.

FOR THE COMMANDING OFFICER:

/s/ A. C. Trakowski, Jr.
A. C. TRAKOWSKI, JR.
Captain, USAF
Director, Base Directorate
for Geophysical Research

3 Incls
1. List of balloons launched (in trip)
2. 8" X 10" photo print of plastic balloon
3. 4" X 5" photo print of plastic balloon

[redacted]

APPENDIX G

Dr. Paul M. Fitts

Psychological Analysis of Reports of Unidentified Aerial Objects

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[redacted]

UNCLASSIFIED [redacted]

U. S. AIR FORCE
HEADQUARTERS, AIR MATERIEL COMMAND
ENGINEERING DIVISION

No. of pages - 5

MCREXD9/PMF/maf

MEMORANDUM REPORT ON

26 April 1949

SUBJECT: Psychological Analysis of Reports of Unidentified Aerial Objects

SECTION: Aero Medical Laboratory

SERIAL NO.: MCREXD-694-16D

Expenditure Order No. 694-38

A. PURPOSE:

1. At the request of the Technical Intelligence Division, Intelligence Department, AMC, an analysis has been made, from a psychological point of view, of 212 investigations of persons reporting sightings of unidentified aerial objects.

B. FACTUAL DATA:

2. A report of this analysis is attached as Appendix A.

C. CONCLUSIONS:

3. It is concluded by the writer that there are sufficient psychological explanations for the reports of unidentified flying objects to provide plausible explanations for reports not otherwise explainable. These errors in identifying real stimuli result chiefly from inability to estimate speed, distance and size.

D. RECOMMENDATIONS:

4. Test the ability of pilots to estimate the course of a small lighted balloon while doing acrobatics with it at night. It is suggested that several pilots try to fly pursuit curves and collision courses on such targets at night and report accurately their sensations. It would be desirable, but probably impossible, to keep them from knowing the nature of the light source.

5. In all future reports of unidentified objects specify the location of object with reference to polar coordinates (direction and degrees above the horizon) rather than asking individuals to estimate distance. If possible, obtain an estimate of size in terms of the visual angle subtended by the object.

6. In all future investigations determine the angular position of the sun with respect to the unidentified object and the observer.

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Also determine the approximate time during which the object was in sight (this information was not available for more than half the reports).

Prepared by: Paul M. Fitts
PAUL M. FITTS, Ph.D.
Chief, Psychology Branch

Prepared by: Shirley C. Connell
SHIRLEY C. CONNELL
Psychology Branch

Approved by: A. P. Gagge
A. P. GAGGE, Lt. Col., MSC (USAF)
Chief, Aero Medical Operations

Approved by: A. P. Gagge for Edward J. Hendricks
EDWARD J. HENDRICKS, Col., MC (USAF)
Chief, Aero Medical Laboratory

Distribution:

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APPENDIX A

PSYCHOLOGICAL ANALYSIS OF REPORTS OF UNIDENTIFIED AERIAL OBJECTS

The Inaccuracy of Human Observation

Psychologists have long know that human perception is fallible. In fact, part of the science of psychology is concerned with the measurement of errors of observation, and with the discovery of the conditions and laws that govern such phenomena.

Errors of observation may be classified as variable or constant. Variable errors are those in which a number of separate observations are found to differ from one another. The distribution of such errors often follows the normal probability curve. Constant errors are those in which observations are consistently biased in one or another direction. For example, individuals often are guilty of a constant error, in the direction of underestimation, in reporting their ages.

Errors of observation may be classified further as precision errors and identification errors. Inaccuracy in estimating the speed of an aircraft is an example of the former. Mistaking an aircraft for a "flying saucer" is an example of the latter.

It is the purpose of the present report to analyse 212 reports of observations of unidentified flying objects in order to see to what extent these reports can be explained in terms of known psychological facts and principles.

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Scientific Method and a Posteriori Data

A word of caution must be injected at the outset of this report. Certain conditions are necessary for drawing valid scientific conclusions.

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These conditions are largely lacking in the case of the data available on unidentified flying objects. It is impossible to say with any assurance what any particular individual in this series of 212 reports was actually observing at any particular time. It is only possible to examine the accumulation of available evidence or the accumulation of all reports of a given class (e.g., all reports from supposedly competent observers) and to consider them in a statistical sense. If certain characteristics appear repeatedly in reports from different people it may be possible to infer causal factors.

It will never be possible, on the other hand, to say with certainty that any given observer could not have seen a space ship or an enemy missile, or some other object. It will only be possible to estimate the probability that he could have seen such things.

The principal hypothesis to be examined in the following discussion is that reports of unidentified flying objects have the characteristics that would be expected if they were cases of failure, on the part of typical normal individuals, to identify common or familiar phenomena.

Possible Sources of Inaccurate Reports of Flying Objects

There are three broad classes of mistakes in human observations. These are the following: 1. Misinterpreting the nature of real stimuli, 2. Mistaking unreal (imaginary) stimuli for real ones, and 3. Deliberate falsifications. Each of these are considered briefly below.

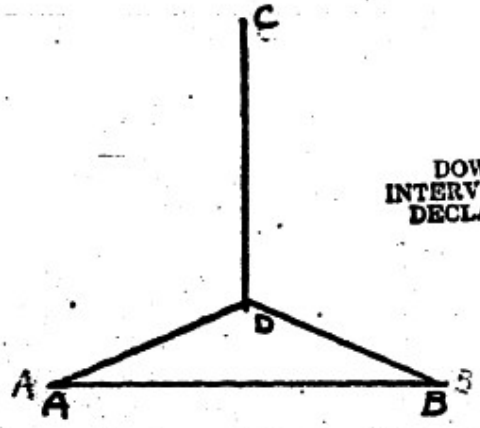
(1) Errors in Identifying Real Stimuli. All normal, intelligene people experience certain errors of observation. The moon appears much larger on the horison than when it is high in the sky. A stick looks bent when one end is in water. Distant objects appear relatively close in clear, desert atmosphere. A small point-source of light, if viewed in a dark room, will appear to move about in strange [illegible], even [illegible]. This is called

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the autokinetic illusion (see Guilford, J. P., 1928). In the accompanying figure the line AB looks approximately as long as the line CD, but when you measure them the two will be found to be of quite different lengths.



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Visual stimuli originating within the eye itself also give rise to mistaken observations. Muscae volitantes or "flying gnats" are small solid particles that float about in the fluids of the eye and cast shadows on the retina. They often can be seen when you look up at the clear sky, or when you are reading. They move as your eyes move. It is sometimes possible also to see corpuscles or other objects that are circulating within the fluids in the retina of the eye.

Then, of course, everyone from time to time mistakes some more or less familiar object for another object. A probable explanation for many reports of unidentified aerial phenomena is that the object is really something quite familiar, such as an aircraft, a light, or a bird. The observer simply fails to identify it correctly. These errors arise chiefly as a result of inability to estimate speed and distance.

(2) Mistaking Imaginary for Real Events. This error of observation is usually made by children, by individuals of low intelligence (people who are very suggestible), by people who see visions, or by the mentally ill. It usually is not difficult for an

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expert to spot this type of person. Reports will be received by such persons especially at times when the radio and newspapers carry accounts of strange phenomena. Relatively few of the 212 investigations considered in this report are of this nature, probably because investigators interviewed only the more reliable type of witness.

(3) Deliberate Falsifications. It is always possible that some persons will give false reports. Circulation of false reports has been a standard psychological warfare technique from earliest times. This procedure might have some utility in wartime, but it hardly seems likely that it would be resorted to at this time. Probably, however, some individuals start false reports of "flying saucers" for the same reason that they turn in false fire alarms.

Some Consistent Points in the Reports of Unidentified Objects.

The following section summarizes some significant facts that come out of a tabulation of 212 reports of interrogations, by USAF Intelligence Officer, of some of the individuals who reported seeing unidentified flying objects. It is understood that these interrogations covered primarily persons that were judged to be reliable. Most of the 212 reports were made by pilots, non-flying officers, professional men, government employees, housewives and other supposedly dependable people.

1. Number of objects. About 75% of the people who reported on the number of objects seen said that they saw only one object.

2. Time the object remained in sight. About half of the persons specifying time in sight saw the object for 60 seconds or less.

3. Altitude and distance of the object. Of those who estimated the distance of the object, two-thirds judged it to be more than a mile away. Ninety percent also thought that it was more than 1,000 feet high.

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4. Speed. About half judged that the speed was less than 500 miles an hour. The other half of the judgments varied from 500 miles an hour all the way to "terrific", "tremendous", "inconceivable" and "blue blazes".

5. Background against which viewed. The great majority of observers saw the object against a clear day or night sky.

6. Time of day sighted. About two-thirds as many observations were reported at night as in the day. There are, of course, many more opportunities for observing things during the day. The most popular hours were from 12 noon to 5:00 P.M. and from 7:00 P.M. to 11:00 P.M. at night. Very few (6 only) observations were made from 5:00 to 7:00 P.M., the usual hours of sunset.

7. Color. Observers almost universally reported seeing a light-colored object. Thirty observers reported "white" and twenty-five said "silver". Over 70 percent described glittering, shiny, luminescent, mirror-like/flame-like or other very bright objects. Only six individuals said black or dark.

8. Shape. Over half described the object as either "round", "disc-shaped", "spherical" or "circular". Other descriptions were similar. Very few observers saw any distinctive shape.

9. Size. The majority of observers did not specify the objects' size. Of those who did over half said it was less than 10 feet in its largest dimension. Many compared it with a dime, a lamp, a dot, a weather ballon, a baseball, etc.

Interpretation of the Common Points of All Reports

The words used by observers to describe the appearances of the unidentified objects fall into a surprisingly uniform pattern. The objects were usually reported as being far away, small, bright and without a distinctive shape. They were usually seen against a clear sky

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and were frequently seen for less than a minute.

First of all, it is obvious that it would usually be impossible for observers to make reliable estimates of the speed, distance, or size of such stimulus objects. It is not possible to estimate accurately the distance of small bright objects viewed against a clear sky, unless the object is identified first. If you know beforehand that an object is a weather balloon, an F-80, or a dirigible you can estimate its speed and distance with some degree of accuracy. In such situations distance is judged on the basis of known size, and speed on the basis of an estimate of distance plus the angular change in position. It must be concluded, therefore, that most of the statements of speed, distance, altitude and size are entirely unreliable and should be disregarded. This is doubly true of observations made at night. The objects seen may actually have been at very great distances, or they may have been relatively close by. In the latter case, of course, they could also have been quite small.

Secondly, it is probable that individuals who saw objects in daylight were in many cases observing either the reflection of the sun on a shiny surface or else looking directly at a light source of high intensity. Aircraft themselves, when viewed against a clear sky, are seen as dark objects against a lighter background unless they are reflecting the sun's rays directly. This fact was recognized during the recent war by camouflage experts who placed bright lights on the leading edges of the wings of aircraft on anti-submarine patrol in order to conceal them from the eyes of submarine lookouts. If observers, during daylight hours, were actually seeing lights, or reflections of the sun, this would account in large measure for their inability to identify the objects. On the other hand, if they were actually seeing enemy missiles, for example, the majority of reports

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of daylight sightings should have been of dark objects... It is possible, of course, that they may have thought the objects were bright because they expected all aerial objects to be bright.

On the basis of the evidence thus far considered, the best guess as to the nature of a visual stimulus that would elicit reports of unidentified flying objects is that in the daytime it would be the reflection of the sun from an aircraft, a wind-blown object, etc., and at night some direct light source, such as an engine exhaust, the light on a weather balloon, a running light on an aircraft, a meteor, etc., or lights from the ground or the moon reflected back by birds or other objects in the air.

Discussion of Several Specific Reports

Discussion of a few specific reports will serve to illustrate some of the points brought up earlier, particularly some of the factors that make observations of aerial phenomena inaccurate.

Incidents No. 81 and 163.

In one case (Investigation No. 81) a civilian employee at Hickam Field at 0900 observed what looked like a balloon with a bright object suspended below it. It was estimated to be at about 6,000 ft. The bright object appeared to reflect the sun's rays at times. After a few minutes he looked away and then could not find the object again.

In another case (No. 163) a reserve officer at Van Nuys, California, about an hour before dark saw an object that looked somewhat like a weather balloon at about 2000 ft. He kept it in sight for about an hour. He later concluded that it was at a great height. At first it had the color of a fluorescent electric light but became orange as the sun went down and then rather suddenly became invisible.

Both of these objects could well have been just what they appeared to resemble most—balloons. The sun was low in the sky in both cases.

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Reflection of the sun's rays may have given an unusual appearance to the object. The second case illustrates the uncertainty of judgments of height or distance. The object looked clear, but when it remained in view for an hour the observer decided that it must be very far away. Actually he probably had nothing on which to base an accurate estimate. [illegible]

Incidents 61 and 61a.

Two couples saw approximately 12 objects flying in formation at what they judged to be 2000 or 3000 feet altitude over Logan, Utah at 22:30. They were judged to be about the size of pigeons and looked white. All four observers agreed that these objects looked and acted somewhat like birds but all thought they were not birds because they appeared to travel much faster than birds.

As we have seen, it is not possible to judge speed accurately under the conditions of these observations, i.e., when looking at objects of unknown size and distance against a night sky. The objects may actually have been a flock of white birds, flying at a relatively low altitude and reflecting the lights of the city.

Incidents 30, 30b, 30c, and 46, 46a, 46b, 46c, 46d.

During the same space of time (about half an hour) on the night of 7 January 1948 observers at Lockbourne Air Force Base, observers at Clinton County AFB and the pilot of an aircraft flying from Dayton to Washington reported an unidentified object in the sky. All reports agreed as to the color and general appearance of the object, and as to the fact that its light at times was visible through a light overcast. All agreed also that it was seen to the southwest. However, persons at all three locations judged the object to be only a few miles away. To all of them it looked motionless at times, then appeared to gain and lose elevation. A very similar object was seen by numerous

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persons at Fort Knox and other towns in Kentucky a few hours earlier. All saw it in the southwest and many thought it was only a few miles away. The Commanding Officer at Goodman Field observed it for 1 1/2 hours, (beginning at 1445). During this time it seemingly remained stationary. It was "chased" by four National Guard pilots, one of whom crashed after having been up to 20,000 feet. It was also reported by persons in Lexington, Madisonville, and Elizabethtown.

The significant fact that emerges from these reports again is the inability to estimate distance. It appears possible that persons over parts of Kentucky and Ohio may have been seeing the same astronomical phenomena which was a great many miles away. Nevertheless each believed it to be relatively near his own location.

Incident No. 172.

A National Guard Pilot returning to Fargo, North Dakota, in a P-51 at approximately 2100 hours saw a small light in the air below him. He was then in the traffic pattern. He dived on the light. The light gained altitude. The pilot "chased" it up to 14,000 feet, making various passes at it and attempts to ram it as he climbed. He finally stalled out.

Several inferences can be drawn from the several reports about this incident. In the first place, when it is night, and a pilot is turning so steeply, and going such violent acrobatics, that he sometimes blacks out, as was the case here, it would be very difficult if not impossible to judge at the same time what another object was doing. In the second place, if the pilot kept his eyes intently on the object, as also was the case here, he would have great difficulty in knowing and reporting later what he himself was doing. The situation is very conducive to loss of orientation. In other words, it is impossible to infer from the pilot's re[redacted] pursuit by him as

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maneuvering or not maneuvering. It is quite possible that it was simply climbing steeply on a relatively straight course, such as would be taken by a lighted weather balloon.

As a matter of fact, a lighted weather balloon was released by the Fargo Weather Station within 10 minutes of the time the light was first sighted by the F-51 pilot. It is the opinion of the writer that this lighted balloon easily could have accounted for all of the pilot's observations. (It should be noted that the standard 30 inch and 65 inch weather balloons have a vertical speed of about 600 and 1100 ft./min. respectively.)

General Discussion and Summary

In the preceding section the hypothesis has been advanced that most reports of unidentified flying objects have been the result of persons failing to identify familiar phenomena, such as reflections from bright surfaces in the day or lights in a night sky. It is believed that this explanation will account for many of the reports. However, some reports undoubtedly have other explanation.

Vertigo. The term vertigo covers a large group of miscellaneous phenomena including air sickness, disbelief in one's instruments, and partial loss of orientation. The conditions under which some of the observations of flying objects were made were such that they could have produced loss of orientation on the part of an observer. This is especially true for those experiences occurring at night and those in which attempts were made to "chase" the object. Movement is always relative. If the only outside reference is a point of light, and both the observer and the object observed are moving, it would be practically impossible under certain conditions to tell which was moving and which was not, or to separate out the two motions. It is hard enough

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to fly a good pursuit curve on another aircraft in good daylight, for example, much less to close on a solitary light at night. The difficulty is due chiefly to the inability to judge distance or speed of a point source of light.

Suggestion. Suggestion works in various ways. Sensational radio and newspaper reports lead a few people to imagine they are seeing things they are not seeing. The effect on most people is to dampen their critical judgment. Under such conditions we are more likely to overlook certain factors, and find it easier to accept the suggested explanation uncritically. The expected result would be to make the reports of most observers slightly less accurate than if they had never heard reports of others seeing "flying saucers". Particularly when the stimulus object is fuzzy or ill-defined, persons tend to see it as resembling whatever is suggested to them. Carmichael et. al., for example (1932) showed individuals simple designs and gave them the name of an object. When the individuals drew the design from memory, they drew it to resemble whatever the object was that had been suggested to them.

Precedent. An historical precedent can be found for most errors of human observation. Although the writer has not tried to make an historical survey of reports of earlier unidentified aerial objects, he feels sure that there have been many such reports in years past, particularly during and after World War I.

Small Wind-borne Objects. It is possible that some observers may have seen small objects carried aloft by strong winds, or objects dropped from aircraft. Bits of paper, small cartons, etc., may occasionally be carried to a considerable height by strong winds. Aircraft may sometimes jettison small articles. It would be impossible to

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estimate the distance, size or speed of such objects, and it would be easy to fail to recognize them.

Conclusions

It is concluded by the writer that there are sufficient psychological explanations for the reports of unidentified flying objects to provide plausible explanations for reports not otherwise explainable. These errors in identifying real stimuli result chiefly from inability to estimate speed, distance and size.

Recommendations

The following recommendations are offered:

1. Test the ability of pilots to estimate the course of a small lighted balloon while doing aerobatics with it at night. It is suggested that several pilots try to fly pursuit curves and collision courses on such targets at night and report accurately their sensations. It would be desirable, but probably impossible, to keep them from knowing the nature of the light source.

2. In all future reports of unidentified objects specify the location of the object with reference to polar coordinates (direction and degrees above the horizon) rather than asking individuals to estimate distance. If possible, obtain an estimate of size in terms of the visual angle subtended by the object.

3. In all future investigations determine the angular position of the sun with respect to the unidentified object and the observer. Also determine the approximate time during which the object was in sight (this information was not available for more than half the reports).

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Guilford, J. P. Autokinesis and the streaming phenomena. American Journal of Psychology, 1929, 40, 401-417.

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APPENDIX H

U. S. Department of Commerce-Weather Bureau

Information on Ball Lightning

COPY

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU
Washington 25

In Reply Please Address
CHIEF OF BUREAU
and Refer to
0-4.3

Dec. 16, 1948

Commanding General
Air Materiel Command
Attention: MCIAXO
Wright-Patterson Air Force Base
Dayton, Ohio

Dear Sir:

Your letter of October 20, 1948, addressed to the National Bureau of Standards and requesting information on the subject of "Ball Lightning" has been referred to this Bureau for reply.

Attached is a tabulation filling in as well as practicable the information called for by the outline presented in your letter. We shall be glad to be of further assistance in connection with this matter.

Very truly yours,

/s/ P. W. Reichelderfer
P. W. Reichelderfer
Chief of Bureau

Attachment

COPY

COPY

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU

Report

Information on "Ball Lightning"

I. Origin

Various theories and suggestions have been proposed to explain ball lightning, most of them being without well-established physical foundation. There is still doubt in scientific circles regarding the origin of a number of reported cases of ball lightning.

Briefly, the explanations of the origin of ball lightning may be broken down as follows:

(1) Brush discharge (St. Elmo's fire).

(May be stationary over sharp-pointed objects, or moving along or near the surface of wires, roofs, rocks, etc., especially on mountains. Conditions most favorable for brush discharge occur during thunderstorms, but the phenomenon may occur even during clear, dry, dusty weather. When a lightning stroke is approaching an object, the brush discharge becomes especially intense.)

(2) Intensely ionized, incandescent volume of air forming end of lightning stroke and lasting for short interval of time.
(This would occur mainly during thunderstorms following the passage of a lightning stroke. At the ground end, the terminal flash is intense, and vapors, smoke or molten material from objects fused at points struck may enhance and extend the duration of incandescence. After-image formed on the retinas of the eyes of a person looking at the brilliant flash at the point of discharge may give spurious effects.)

(3) Brush discharge in air containing high concentration of dust or other aerosols, during thunderstorms.
(If this occurs, it probably is associated with the path taken by a real lightning stroke, and presumably involves corona discharges from suspended particles and possibly combustion in some cases.)

(4) Jumping of gap by lightning indoors.
(When lightning strikes a house, lightning streamers may jump gaps such as between pipes within the house, thus causing a bright flash of limited extent. After-image is generally formed on the retina and movements of eye produce apparent movements of the illuminated region.)

(5) A cloud-to-ground lightning stroke with an associate, horizontally-directed, moving potential wave may possibly produce a transient horizontal potential gradient sufficiently intense to initiate electrical discharges.
(Such discharges would involve luminous darts moving at high speed and may move over irregular trajectories, producing, in some cases at least, more-or-less horizontally directed, sinuous, ribbon-like or tubular paths. If there is a heavy concentration of electrical charges near the earth beneath the thunderstorm the triggering of a discharge by the transient potential gradient may yield horizontal lightning streamers having a relatively slow propagation rate and long duration.)

(6) A lightning discharge that strikes and runs along a conductor such as power or telephone lines and flashes-over or jumps the gaps at breaks produces a brilliant illumination at the gaps that may be mistaken for ball lightning.

(7) A piece of wire with attached light object that is carried aloft by the gusty winds and turbulence attending a thunderstorm or tornado may serve to facilitate conduction of lightning currents and yield streamers at its ends during discharges.

(8) Spurious cases.

(a) After-image (persistence of vision)

(b) Will-o'-the Wisp

(c) Meteorites

(d) Reflections of lightning observed on highly polished objects, such as door knobs.

(e) Falling molten metal

(f) Lightning channel seen on end.

II. Appearance

(a) Forms

Spherical, roughly globular, egg-shaped, or pear-shaped; many times with projecting streamers; or flame-like irregular "masses of light." Appearance of outer boundary is generally hazy or ill-defined. Photographs of the phenomenon may show one or several sinuous, tubular propagation paths (trajectories taken by luminous darts), which may have associated with them broader luminous spaces of irregular configuration. (These latter spaces probably are regions where the sinuosities of path became involved and tortuous or are areas of major discharge where darts originated or terminated). Some paths show a beaded structure (alternate luminous and dark spaces).

(b) Color

Luminous in appearance, described in individual cases by different colors but mostly reported as deep red and often as glaring white. One scientist described the color in a certain case as similar to that he has noted in the laboratory on observing active nitrogen, or possibly slightly darker. Another observed one of yellow and still another of lavender or rose color. Others have reported some of blue appearance. The luminous mass is occasionally stated to be surrounded by a border, weakly but differently-colored than the main body.

(c) Degrees of Brilliance

Brilliance at most glaring white and incandescent. Minimum brilliance equal to that of feeble St. Elmo's Fire.

(d) Movement through Space

1. Possible directions.

Generally downward, inclined or horizontal, in straight, curved, or tortuous paths. Mostly observed near the surface, but may originate in thunderclouds, and so take a trajectory from cloud to earth.

2. Maneuverability

May appear stationary, or moving. Range of speed is zero to values of the order of 10^7 cm./sec. In the

latter, extreme case, the luminous darts observed are probably of the same general nature as the lightning streamer, although the path taken may be very irregular and even show reversals in direction. In some cases, long sections of paths of such luminous darts may show slight curvature. Near the ground or in closed spaces a much smaller speed is often said to be observed, mostly about 1 - 2 meters/sec. The "ball of fire" may seem to move or float along in a room, or to roll along the floor. In a thunderstorm, as may be experienced on a mountain top, an observer has reported "seeing balls of fire roll along the rocks and drop from one to another." Intense St. Elmo's Fire on sharp objects beneath thunderstorms may fluctuate rapidly in size, intensity, and orientation, or show displacements from one point to another, hence the flame may appear to whirl and dance, or move. When a lightning flashover at a point produces an after-image on the observer's retina, movements of the eyes cause corresponding movements of the image which the untrained observer attributes to the movement of a luminous "ball of fire" or flame. Ball lightning observed by Jensen[1] in the wake of a lightning flash through dust-laden air during a thunderstorm "appeared as a shapeless mass of lavender color which seemed to float slowly downward." Jensen states: "The rose-colored mass seemed most brilliant near the ground and gave the impression of a gigantic pyrotechnic display. Two or three of the globular structures seemed to roll along a pair of 2300 volt power lines for 100 feet or more, then bounded down on the ground and disappeared with a loud report."

When a lightning streamer from a thundercloud terminates in the air, the leader stroke is sometimes so faintly luminous in portions that only a segment of the path is observed. This may conceivably give the impression of elongated "ball lightning," but is a natural cloud-air lightning stroke.

3. Nearby Air or other Craft

There have been numerous cases of aircraft struck by lightning. When the aircraft is all-metallic, it serves as a Faraday cage, and provides electrical protection

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1. Jensen, J. C. Physics, vol. 4, p. 372 (1933).

to the crew and passengers. Just preceding the onset of a lightning stroke to an aircraft, pilots have reported observing a streamer of corona discharge build up on the nose, propellers or other extremity of the craft[1]. The movement of the streamer accompanies that of the aircraft and depends on the passage of a lightning stroke nearly or through the aircraft. Corona discharges on sharply convex surfaces of aircraft have also been observed during flight between masses of clouds strongly charged with electrical charges of opposite sign (positive and negative). Autogenous charging of the aircraft by tribo-electric and other effects during flight through snow or other precipitation particles intensifies the corona discharges. These are of the same nature as St. Elmo's Fire.

St. Elmo's Fire has been observed numerous times on the mastheads of ships and generally moves with them during passage beneath thunderclouds or other meteorological conditions where intense electrical potential gradients exist.

(e) Effect on Surrounding Atmosphere

1. Clouds

Lightning of any kind can occur in clouds only if the dielectric properties of the air are broken down when the sparking potential gradient is reached. In clear air this amounts to about 30,000 volts per cm. at sea level and about 21,000 volts per cm. at 10,000 ft. altitude. In clouds, or in the presence of precipitation particles the sparking potential gradient is less, depending on the size of the particles. For example, in the presence of raindrops 1/8 inch in diameter it is about 10,000 volts/cm.

As shown by Macky[2], droplets of water suspended in an electrical field sufficiently intense to induce breakdown will display sparking-over phenomena and will

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1. Harrison, L. P., "Lightning Discharges to Aircraft and Associated Meteorological Conditions," N.A.C.A. Technical Note 1001, (1946).
2. Macky, W. A., Proc. Roy. Soc. London, Ser. A, vol. 133, pp. 565-587, (1931).

become deformed. Under very strong fields, the droplets become drawn out into filaments and disrupt with attendant electrical discharges along their surfaces or through them.

It is probable that these phenomena occur along the channel of a lightning stroke through a cloud, and that some evaporation and disruptive breakdown of droplets occur in consequence of the intense heat and flow of electrical charges. These major effects on cloud or precipitation particles are believed to be confined to the lightning channel, although minor effects such as glow or brush discharges from particles in other portions of the cloud possibly occur in connection with the development of lightning strokes. These discharges from countless particles may yield a general illumination within the cloud under strong electrical field conditions, especially during propagation of lightning strokes.

Effects of "ball lightning" on clouds are unknown. Since "ball lightning," if real, is presumably less severe than an ordinary lightning stroke or at most is probably a dart streamer of such a stroke, we may assume that the effects of "ball lightning" on clouds are not more severe than those outlined above in connection with lightning.

2. Increased Ionization

The formation of corona discharge at any point leads to a considerable increase in ionization of the surrounding air. Any case of so-called "ball lightning" which is actually a corona discharge will have a similar effect.

Ordinary lightning strokes distribute heavy concentrations of electrons and ions or charged nuclei along and near their channels during the passage of the stepped leader or dart leader. These particles form a space charge surrounding the channel. After the leader reaches the earth, the return stroke occurs from earth to cloud. When this develops, the space charge tends to migrate rapidly to the channel, producing a rush of charges within it. The flow of these charges in the channel yields the brilliant, return lightning stroke. Within the channel ionization is exceeding heavy.

"Ball lightning" associated with a true lightning stroke will probably involve a flow of space charges to its

channel and so leads to a diminution of space charge from the environment of the path but an immediate increase of ionization along its path. Following the passage of the phenomenon, ionization will decay by recombination.

3. Nearby Air or Other Craft

All metallic aircraft which are struck by true lightning generally have scorch marks, pits, or holes burned through the skin. The holes rarely exceed one inch in diameter. (See N.A.C.A. Technical Note 1001). Portions of non-metallic material in contact with the area struck may be burnt or explosively separated from the metal to which the material is attached. When radio antennae are struck or the lightning arrester does not function as desired, damage to radio equipment often occurs.

Temporary blinding of pilots looking directly at the flash due to the stroke to some exterior portion of the aircraft such as the nose of the fuselage may introduce some hazard. As a rule the temporary blinding is effective from about 10 seconds to a larger fraction of a minute, but in one extreme case a copilot was reported to have been temporarily blinded for about 8 minutes. Several cases of temporary blinding of about 3 minutes have been reported.

The Weather Bureau has not received any reports of accidents in which an airplane was said to have suffered contact with "ball lightning." Judging by the phenomenon called by that name and experienced at the surface, the aircraft damage to be expected by such contact would probably be less severe than that caused by a typical genuine lightning stroke. That type of so-called "ball lightning" which is actually an intense corona discharge would not cause any mechanical damage to non-inflammable exposed materials, but would hamper radio communications by producing static similar to the kind termed "precipitation static."

A real lightning stroke to a non-metallic object on the ground often causes an explosive disruptive effect on the object and will cause burning of inflammable materials.

Contact of so-called "ball lightning" may have physical effects on exposed persons varying from negligible to

fatal. In the cases of fatalities resulting from this cause, it is believed that genuine lightning was involved. Physical effects of electrical origin on persons enclosed in all-metallic aircraft are negligible, owing to the Faraday cage protection afforded by the conducting skin. However, a slight electrical shock may be experienced by a crew member aboard an aircraft if he is making good contact at two well separated points during passage of the steep wavefront of potential through the area of contact at the time of a real lightning stroke.

(f) Accompanying Phenomena

1. Sound

The origination and dissipation of "ball lightning" at the surface are often attended by a sharp report, but not invariably. Very frequently the beginning or end, respectively, of "ball lightning" is accompanied by a positively identified stroke of streak lightning to or very nearly to the point of observation. The thunder produced by such a stroke will naturally be considered by many observers to have been associated with the "ball lightning." "Ball lightning" which is in the form of a corona discharge makes very little sound, since the current carried is very low and the explosive heating effects on the air negligible. Lightning of the continuing-current type, with low-wavefront, will not produce intense sounds, and this is to be more or less expected, also, of isolated luminous dart streamers traversing the channels of preceding or succeeding lightning strokes. Such streamers have been included in the category of "ball lightning."

2. Chemical Effects

The odor of ozone in connection with "ball lightning" has been reported by some observers. This is to be expected in cases where the phenomenon is a brush discharge which produces ozone in air. When actual streak lightning is involved, the formation of oxides of nitrogen and ozone is a normal occurrence.

3. Thermal Effects

Fires have been caused in combustible material, such as straw, by discharges reported to have been "ball lightning."

4. Electrical Effects

"Ball lightning" will certainly be accompanied by radio static in some form. Electrical shock to persons is possible when the phenomenon stems from streak lightning. Disruptive mechanical effects on non-conductors especially if containing moisture, or crushing effects on hollow conducting tubes may occur in cases where actual steep wave-front, lightning currents pass through the objects.

5. Optical Appearances

Some of the cases of "ball lightning" observed have displayed excrescences of the appearance of little flames emanating from the main body of the luminous mass, or luminous streamers have developed from it and propagated slant-wise toward the ground. In rare instances, it has been reported that the luminous body may break up into a number of smaller balls which may appear to fall towards the earth like a rain of sparks. It has even been reported that the ball has suddenly ejected a whole bundle of many luminous, radiating streamers toward the earth, and then disappeared.

Jensen[1] has quoted the following report of electrical discharges appearing in a violent storm: "A tornado which occurred on the evening of July 9, 1932, near Rock Rapids, Iowa, gave evidence of a closely related type of luminous display according to the report of Mr. George Raveling, U. S. Weather Bureau observer. From the sides of the boiling, dust-laden cloud a fiery stream poured out like water through a sieve, breaking into spheres of irregular shape as they descended. No streak lightning of the usual type was observed and no noise attended the fire-balls other than the usual roar of the storm."

(6) Possible Objects to Which Attracted

Lightning strokes are more likely to hit at or near the top of high, pointed objects, than on the surfaces of low objects with flat or concave exteriors. If the tips of the high objects are grounded via conductors such as wires or metal pipes, they will tend to show a higher frequency to strokes than ungrounded objects. This is especially true if, in the former case, the

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1. Jensen, J. C., Physics, vol. 4, p. 374 (1933).

ground is well moistened or possesses an extensive network of conducting elements (water pipes, telephone and electric cables, etc.)

It follows that the lightning flash will be observed more frequently at these relatively high points than elsewhere, and hence probably that "ball lightning" will appear to develop quite commonly at such points.

Brush discharges tend to form at sharply convex extremities of objects, and align themselves in the direction of the potential gradient. Well-grounded and conducting objects would generally receive preference. These considerations apply to cases which were classified by the layman as "ball lightning" but actually were cases of St. Elmo's Fire (bright glow or brush discharges).

There have been reports by observers of "ball lightning" to the effect that the phenomenon appeared to float through a room or other space for a brief interval of time without making contact with or being attracted by objects. Holzer and Workman[1] have published a reproduction of moving film camera photographs of unusual discharges during thunderstorms. In the case of the phenomenon observed at Santa Fe, New Mexico (elevation 7000 feet) on the night of September 3, 1936, these authors state: "The cameras were mounted rigidly on a bench in a portable laboratory. The discharge was probably about 100 feet from the cameras, although the exact distance is not known since no thunder addociated with this flash could be distinguished from the general background of thunder. The discharge occurred within less than one-thousandth of a second after an intense cloud ground stroke not shown on this portion of the film. Analysis of the photographs indicates that the discharge consisted of at least four luminous darts moving with a projected velocity of the order of 10^7 cm/sec. The most notable features of this discharge are: (1) its irregularity of path and rapid reversals in direction, (2) its proximity to ground objects with no apparent contact with the ground, (3) the beaded nature of the path, and (4) the progress of the discharge in two directions from a single point."

Note should be made of the fact that the luminous darts did not appear to be attracted to available ground objects even though they were in the vicinity of the ground. On this basis it cannot be stated whether there are any definite objects to which all cases of "ball lightning" would be attracted. We should think that sharp-pointed, grounded objects are most likely to attract "ball lightning."

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1. Holzer, R. E., and Workman, E. J., Jour. of Applied Physics, vol. 10, p. 659 (1939).

(h) Methods of Terminal Dissipation

As a rule so-called "ball lightning" of the variety which we judge to be intense brush discharge dissipates when the potential gradient diminishes to a value below the critical one for maintenance of the discharge. This generally occurs following lightning strokes which largely discharge the heavy concentrations of electric charges of opposite sign in the overlying thundercloud.

"Ball lightning" which appears to form at sharp-pointed objects as a lightning stroke approaches disappears when (a) the main lightning currents cease flowing just after contact of the stroke or (b) the space charge around the lightning channel is largely collected into the channel and transported to earth or cloud.

"Ball lightning" which appears to be a luminous dart like a meteorite rapidly falling (or rising) along the path of an immediately preceding or succeeding lightning stroke disappears into the earth (or cloud).

"Ball lightning" in the form of a luminous ball apparently moving through a space or rolling along the ground dissipates eventually, perhaps on making contact with some object. Some observers have stated that the ball collapses with a noise resembling that of a big firecracker, leaving an odor of ozone. It seems probable that in these cases also the dissipation takes place when the potential gradient has diminished below the critical value for maintenance of the discharge, simultaneously with the occurrence of a genuine lightning stroke to the area involved.

As indicated previously, reports have also been given that the main body of the "ball lightning" has appeared to have broken up into a number of smaller "balls" which have fallen to earth, or to have emitted small streaks, like lightning, projected towards the earth, and thus dissipated.

A sound of thunder, of greater or lesser intensity, may accompany the dissipation. It is not possible to be certain that the sound is always intimately connected with the phenomenon, for it may have been the thunder associated with a nearby lightning stroke.

III, Recommended Material for Questionnaire

1. Name and address of person who observed phenomenon
2. Age, education and employment of person
   (Specify especially training, if any, in scientific fields such as physics, engineering, etc.)
3. Name, address and educational qualifications of person who prepared questionnaire
4. Date and time of occurrence
5. Geographic location
6. Elevation
7. Character of observation point and surroundings
   (State whether inside or outside; kind of structure, if any; neighboring structures or ground objects; and terrain)
8. Illumination available (natural and artificial)
9. Weather conditions (as thunderstorm, rain, overcast)
10. State whether genuine streak lightning was observed (a) before, (b) after, the "ball lightning"; and indicate time interval between phenomena
11. Indicate direction and apparent distance of such streak lightning; also objects believed to have been struck by it
12. State whether glow or brush discharges were observed (a) before, (b) after, the "ball lightning"; and indicate time interval between phenomena
13. Indicate locations at which glow or brush discharges were observed, and objects on which they appeared
14. Indicate brightness of discharge at points of occurrence referred to in (11) and (13)
15. Shape of ball lightning observed
16. Transparency of "ball" and general appearance of its exterior and periphery
17. Changes in its form

18. Indicate whether flames or streamers emerged from it, and describe them

19. Location, distance, and height of phenomenon when first observed

20. Apparent size of phenomenon

21. Rotation, if any, observed

22. Colors

23. Brightness

24. Smoke or vapors emitted (color, odor, form, etc.)

25. Odor (during and after occurrence of phenomenon)

26. Heating effects, if any

27. Physiological effects

28. Mechanical effects

29. Electrical or magnetic effects

30. Sounds accompanying original appearance and life-span of phenomenon

31. Path taken by "ball lightning," including height and location during its life span

32. Movements of observer during phenomenon (including movements of head and eyes, if possible)

33. Speed of motion of "ball lightning"

34. Duration of phenomenon and duration of period of observation

35. Indicate any special conditions observed to attend beginning of phenomenon

36. Indicate conditions observed at time of ending of phenomenon

37. Traces, if any, left after dissipation

38. Psychological effect on observers

39. Was sould like that of thunder heard at time of its disappearance? Describe its intensity and character

APPENDIX F

U. S. Department of Commerce Weather Bureau

Information on Ball Lightning

COPY

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU
Washington 25

In Reply Please Address
CHIEF OF BUREAU
and Refer to
0-4.3

Dec. 16, 1948

Commanding General
Air Materiel Command
Attention: MCIAXO
Wright-Patterson Air Force Base
Dayton, Ohio

Dear Sir:

Your letter of October 20, 1948, addressed to the National Bureau of Standards and requesting information on the subject of "Ball Lightning" has been referred to this Bureau for reply.

Attached is a tabulation filling in as well as practicable the information called for by the outline presented in your letter. We shall be glad to be of further assistance in connection with this matter.

Very truly yours,

/s/ F. W. Reichelderfer
F. W. Reichelderfer
Chief of Bureau

Attachment

COPY

APPENDIX I

Project Grudge

Summary of AHC Evaluation of Remaining Reports

APPENDIX I

In the following section of this report, each remaining unexplained incident is considered separately. It is not the intent to generally discredit the character of observers, but each case has undesirable elements, and these cannot be disregarded. The numerical designation is merely the categorical order of the incident in the project files.

Incident No. 1 — 8 July 1947, 0930 hours local, Muroc Air Force Base. Four witnesses, all observed two silver disc like or spherical objects against a clear bright sky. All witnesses estimated the altitude at about 8000 feet, and the speed between 300 and 400 MPH. It is possible to estimate distance and speed of an object with a fair degree of accuracy if the size is known. The distance is judged on the known size and speed on an estimate of distance, plus angular change in position (see page 8, app. G). In this incident the size could not be known, owing to the fact that the object was not identified. The time in sight and angular distance traveled were not given. However, the first witness stated he sighted the objects at 0930, and the last witness said he was called to view the objects at 1000. Time in sight is therefore assumed to be at least one-half hour. The objects reportedly traveled in a straight line. Taking the mean reported speed (350 MPH), the objects must then have traveled 175 MPH while in sight. If the objects were of such proportions as to be seen at that distance, it is believed that more details could have been observed at the first sighting. Two additional remarkable aspects of this case are:

1. A few moments previous to the sighting, the first witness was engaged in conversation. Quoting the witness, "My part in this conversation was as follows: 'Someone will have to show me one of those discs before I will believe it.'"

2. The statements of the three other witnesses were made to the first witness. All three agree almost identically with the first. It is probable, therefore, that their evidence was influenced by suggestion.

ANC Opinion: This report is a result of misinterpretation of the nature of real stimuli, probably research balloons.

Incident No. 10 — 4 July 1947, 2004 hours, Boise, Idaho. An airline pilot and crew watched from the air two groups, (5 and 4 in number) of objects described as thin and smooth on the bottom and rough on top, silhouetted against sunset and flying "loose formation." They followed them for forty-five miles; therefore, had them in sight for approximately ten minutes. No further information was submitted.

AAF Opinion: Since the sighting occurred at sunset, when light conditions change rapidly and illusory effects are most likely, the objects could have been ordinary aircraft, balloons, birds, or pure illusion. Insufficient information.

Incident No. 17 — 24 June 1947, afternoon, Mt. Rainier, Washington. One witness viewed nine "saucer-like discs" from the air calculated to be 20 to 25 miles distant, and 45-50 feet in length, (about 20 times as long as wide) which traveled 47 miles in 102 seconds (1700 MPH). Dr. Hynek calculated mathematically (see Appendix B) that assuming the estimate of distance to be accurate, in order to see such detail, the objects would need to have been at least 100 feet thick, therefore, 2000 feet long. If the estimated size is more nearly correct, then to have been seen as described, the objects would have been roughly six miles distant. At this distance they would have traveled only 11 miles in 102 seconds, or approximately 400 MPH. The entire report of this incident is replete with inconsistencies. It is to be noted that the observer has profited from this story by selling it to Fate magazine.

AMC Opinion: The report cannot bear even superficial examination, therefore, must be disregarded. There are strong indications that this report and its attendant publicity is largely responsible for subsequent reports.

Incident No. 21 — 29 June 1947, 1645, Des Moines, Iowa.
The observer, a bus driver, reported observing thirteen objects at 1200 ft altitude, traveling in a straight line in file at 300 MPH. The objects were elliptical in form "inverted saucer", 12 ft thick, 175-250 ft in diameter, dirty white, and made a sound like an electric motor or dynamo. There was no further information supplied except that the observer stated they looked like dots in the sky.

AMC Opinion: These objects were seen just outside Des Moines, and were flying toward Des Moines. If they were not ordinary objects mistaken for something else by the observer, but were really unusual aircraft, it seems almost certain that someone else would have also reported them. There is insufficient information for a proper analysis.

Incident No. 29 — 14 June 1947, 1200 and 1415, Bakersfield, Calif. The observer, an experienced pilot, reported sighting ten and later seven objects at 8500 ft altitude, traveling 350 MPH in a loose "V" formation. Although the objects were apparently at a considerable distance, the reporter described them as being similar to the XF5U-1 "Flying Flapjack." He stated that he attached no particular importance to this sighting until he read of the Cascade Mountain sighting, (Incident No. 17). He then recalled this incident.

AIC Opinion: There is no information contained in this report to refute the assumption that these objects were ordinary aircraft beyond the range of identification. The fact that no one else in Bakersfield reported observing anything unusual, tends to substantiate this conclusion.

Incident No. 35 -- 14 October 1947, 1200 hours, eleven miles north, N.E. of Cave Creek, Arizona.

Two mine operators observed one object at 8000 to 10,000 ft altitude, traveling 350 MPH, S.E. in a straight line for a period of 45-60 seconds. The object was red against the sky, and black against a cloud. It appeared to be three feet in diameter from point of observation. The OSI report of investigation states that one observer thought it was a buzzard, but decided later that it was not; the other observer said it resembled a flying wing, but was not a flying wing. No reasons are given for these apparently superfluous and conflicting remarks. As in many other instances, these observers cite their flying experience as qualification for their ability to observe and report details.

AMC Opinion: From the limited data furnished in this report, it is difficult to arrive at any conclusion. If the object was actually 10,000 ft distant, and yet appeared three feet wide to the observer, it would of necessity been huge. This sole point of contention tends to discredit the report.

Incident No. 37 -- 14 October 1947, 1200 hours, eleven miles North, N. E. of Cave Creek, Arizona.

Two mine operators observed one object at 8000 to 10,000 ft altitude, traveling 350 MPH S.E. in a straight line for a period of 45-60 seconds. The object was red against the sky, and black against a cloud. It appeared to be three feet in diameter from point of observation. The OSI report of investigation states that one observer thought it was a buzzard, but decided later that it was not; the other observer said it resembled a flying wing, but was not a flying wing. No reasons are given for these apparently superfluous and conflicting remarks. As in many other instances, these observers cite their flying experience as qualification for their ability to observe and report details.

AMC Opinion: From the limited data furnished in this report, it is difficult to arrive at any conclusion. If the object was actually 10,000 ft distant, and yet appeared three feet wide to the observer, it would of necessity been huge. This sole point of contention tends to discredit the report.

Incident No. 40 — 7 July 1947, 1600 hours, Phoenix, Airzona. One observer witnessed an elliptical, flat, gray object, measuring 20-30 ft across, flying 400-600 MPH, spiraling downward to 2000 ft from 9000 ft, then ascending at a 45° angle into an overcast. Observer ran into a garage where he obtained a Kodak Brownie 120 box camera, and snapped two pictures; one negative, and a print of the other, are contained in project files. The negative displays a small apparently flat object rounded on one end, and pointed on the other. The object appears to have a hole in the center. The image is in stark contrast with the background of clouds. From the print, the object appears to be jet black with sharp outlines. Four expert photographers concur in the opinion that the image is of true photographic nature. However, they disagree with each other as to the possibility of filming such an occurrence under the conditions described. Considering the object was grey as described, and at a distance of 2000 feet, it seems unlikely that it would appear pure black on the print. In subsequent correspondence to the reporter of this incident, the observer refers to himself as Chief of Staff of Panoramic Research Laboratory, the letterhead of which lists photography among one of its specialities. Yet, the negative was carelessly cut and faultily developed. It is covered with streaks and over a period of six months, has faded very noticeably. An OSI agent discovered that a letter by this observer was published by Amazing Stories magazine early this year. In this letter he stated that he had been interviewed by two Federal agents, had given them pictures of "flying discs" and that the pictures had not been returned. He requested the advice of the magazine as to how to proceed to sue the Government. This individual is aware of the whereabouts of these pictures, but has never requested their return. There are other undesirable aspects to this case. The observer's character and business affiliations are presently under investigation, the results of which are not yet known. Dr. Irving Langmuir studied subject photographs, and after learning of the prior passage of a thunderstorm, discounted the photographed object as being merely paper swept up by the winds.

AIC Opinion: In view of the apparent character of the witness, the conclusion by Dr. Langmuir seems entirely probable.

Incident No. 51 — 3 September 1947, 1215 hours, Oswego, Oregon. A housewife observed twelve to fifteen round, silver-colored objects at a high altitude. No further information was submitted, therefore, no conclusion can be reached.

Incident No. 58 — 4 August 1947, Sunset, near Bethel, Alaska.
A pilot and his co-pilot observed a black object of the design and approximate dimensions of a C-54 fuselage, flying at 500-1000 ft altitude N.W. The object crossed their path at right angle, and they pulled up to 1200 ft to avoid a collision, then chased it at 170, but lost sight of it in four minutes. They estimated the speed of the object to be three times their own, or 510 MPH. Assuming the estimate of speed to be correct, elementary computations determine the distances object traveled as 34 miles in four minutes while the observer's airplane moved eleven miles in the same period. Therefore, the object was more than twenty-miles distant when last seen. To be capable of being seen at this distance under the conditions given, the object would have to be about 50 feet in its smallest or end-on dimension. If this were true, and the object was proportionate with a C-54 fuselage, its length would be about 500 ft. Assuming the estimate of speed to be incorrect, but time in sight to be correct, the problem is figured in reverse, using as a reasonable width 15 feet. In this event the object would have been less than ten miles away when lost to sight, therefore, it would have traveled about eighteen miles in four minutes, giving a speed of less than 300 MPH.

ATC Opinion: It is believed that the pilots were suddenly startled by a conventional aircraft crossing their path, and that as they gave chase to the aircraft which was "silhouetted against a brilliant evening sky", they were partially blinded, and were therefore unable to discern wings or engines.

Incident No. 62 -- 8 September 1947, 2230-2300 hours, Logan, Utah. A man and his wife, together with five other unidentified people, observed five groups each of 35-60 small objects, yellowish-white in color, flying several thousand feet in the air at a high rate of speed. The weather was cloudy.

AIC Opinion: From the limited evidence submitted, it is practically impossible to formulate a conclusion. Fast motion could be attributed to closeness rather than to true linear distance. In an atmosphere of darkness, any impression may be erroneous. Ground lights reflected from moving, low-hanging clouds, themselves not visible, could readily account for this report. Light colored birds are another possibility.

Incident No. 64 — 19 August 1947, 2130 hours, Twin Falls, Idaho. Several people were reported as sighting numerous groups of objects in the night sky. These objects were described as a glow in the air with a color similar to regular electric lights. The objects were said to have traveled at "terrific" speed. Some flew in triangular formation. Three objects peeled off of one group of ten, and proceeded on another course. The sky was overcast. Two observers stated that the objects could not have been birds since the lights were not a reflection of city lights.

AIC Opinion: Many familiar objects visible because of the fact that they reflect light, appear to be incandescent; for example, the moon and certain planets. The evidence is, therefore, contradictory since in one instance the objects are described as merely a glow, and later on as not being reflectory. The submitted evidence is readily explained as in incident 62; ground lights reflected from clouds, or birds in flight.

Incident No. 68 — 24 June 1947, Daytime, Cascade Mountains, Washington. A prospector reported sighting five or six round objects with tails, 1000 ft overhead, heading S.E., and banking in the sun. The objects were in sight 45-60 seconds and alleged to be thirty feet in diameter. They made no noise. While the objects were within sight, the observers compass fluctuated wildly. He states that he read of a former sighting (incident No. 17) also occurring on 24 June 1947, and submitted this report solely to add credence to the person who provided that story. While there appears to be an attempt on the part of the observer to infer that these objects were possibly the same as those reported in (incident No. 17), there are several major differences, notably as Dr. Hynek points out (app.B), that these objects had tails, and that the inferred size, as determined from the estimated distance, is quite different. Dr. Valley (App D) has pointed out and Dr. Hynek concurred that it is difficult to take seriously the peculiar action of the compass for this would imply fantastically large magnetic fields.

AMC Opinion: From the limited evidence submitted, it is impossible to reach a definite conclusion. However, two possible psychological factors are readily apparent; one, the observer stated he submitted this report solely because he had read several days following his observation of another sighting. Therefore, he very likely either consciously or inadvertently may have attempted to conform his report to that recounted in the newspaper; and two, he colored his report with inference of huge magnetic fields, as to the implications of which he was obviously uninformed.

Incident No. 71 — 8 or 9 October 1947, daytime, Las Vegas, Nevada. An Air Force Reserve pilot reported observing a trail appearing high in the sky at an estimated speed of 400-1000 MPH. The object producing the trail was not visible. The trail was white as a cloud, and dissipated in fifteen to twenty minutes. The object proceeded in a straight line, then it made an approximately 180° turn of radius five to fifteen miles, and proceeded away toward the direction of first appearance. The weather was described as "almost cloudless."

AMC Opinion: It is difficult to understand why this individual attached any importance to this sighting, and why he did not conclude that the trail was caused by exactly what it appears to have been; that is, an ordinary aircraft flying normally at an altitude too high for itself to be visible, but in the best altitude range to form vapor trails 20,000 - 45,000 feet.

Incident No. 75 -- 13 August 1947, 1300 hours, Smoke River Canyon, Idaho. A farmer together with his two sons, ten and eight years of age, witnessed an object move down a canyon. It was in view only momentarily at a distance of 300 feet, and approximately 75 feet above the ground. The object made a swishing sound, and was sky-blue in color. The farmer doubted the possibility of its visibility if viewed against the sky. The children told of smokeless turbine or exhaust flames shooting from the device through which could be seen daylight. The object passed over some trees, which in the words of the farmer, "spun around on top as if they were in a vacuum."

AMC Opinion: It seems logical to concur with Dr. Hynek's deduction, that this object was simply a rapidly moving atmospheric eddy.

Incident No. 76 -- 13 August 1947, Salmon Dam, Idaho.

Two men reported simultaneously hearing a roar, and looking up observed two objects of undetermined size, several miles distant at a great height which they thought might have been 4000-6000 feet. The objects were "circular", "reflected light", and were traveling at "great speed" Although occurring on the same day as Incident No. 75, the descriptions vary widely.

AMC Opinion: There is no information contained in this report to refute the assumption that these men saw two ordinary aircraft at too great a distance to discern details.

Incident No. 77 -- 3 July 1947, 1430 Hours, South Brooksville, Maine.

This observer, an "astronomer", heard a loud roar and with difficulty observed at 50° elevation approximately ten very light-colored objects traveling N. W. The group is reported to have covered 1 1/2° angular diameter in the sky, bunched together with no regular formation. He calculated that at a distance of 10 miles the objects would have a speed of 1200 MPH; that their width must be 100 feet across and due to their color would be barely visible. He also estimated the object would have a width of fifty feet at five miles with a speed of 600 MPH. He believed they were aircraft of some type, owing to the loud roar. In his letter he asked, "have any meteorites been reported?"

AMC Opinion: It is believed that the observer should have been able to rule out the possibility of meteorites. Reducing the estimate of distance, and correspondingly reducing the required size to that of objects such as birds or insects, then the speeds become very modest. If the objects were actually five to ten miles distant, and responsible for the "unusually loud roar", it is expected that numerous other reports would have been received from this section of Maine, which is thickly populated.

Incident No. 79 -- April 1947, Richmond, Virginia

A weather bureau observer at the Richmond Station observed on three different occasions, during the six-month period prior to April 1947, a disc-like metal chroce object. All sightings were made through a theodolite while making pibal observations. On the last reported sighting, the balloon was at 15,000 feet altitude, the disc followed for fifteen seconds. It was shaped like an ellipse with a flat level bottom and a dome-like top. The altitude and speed were not estimated, but the object, allegedly through the instrument, appeared larger than the balloon. Another observer at the same station saw a similar object under corresponding circumstances, with the exception that her balloon was at an altitude of 27,000 feet and possessed a dull metallic luster. There was good visibility on days of observation. Report of this sighting was not submitted until 22 July 1947.

AMC Opinion: There is no readily apparent explanation. If there were only one such object, it seems amazingly coincidental that it would be seen four times near the pibal of this station only. On the other hand, there would have to have been a great number of these objects to rule out coincidence, and as the number of objects increases so do the chances of sightings by other witnesses.

Incident No. 24 -- 7 July 1947, 1300-1400 Hours, Lakeland, Fla. One observer reported hearing a swishing noise and then seeing, five shiny objects climbing from 5000 ft to 7500 ft in fifteen to thirty seconds. He estimated the objects were one mile from him. The lead object was of plastic appearance and appeared to be towing the other four. The reporter made a model and submitted it as an exhibit. The model is roughlytwo feet in diameter, domed top and bottom and with an opening in the rear on either side of a vertical fin. Police records list the man as having been AWOL from the Navy on two occasions. A neighborhood and employment check disclosed he is an excitable person, very talkative, possessing an exaggerated imagination, and inclined to impress people with his continuous verbal chatter.

AMC Opinion: This incident has all the aspects of a psychopathological report.

Incident No. 111 — 1 April 1947, 0955 Hours, Central Phillipines. An F-47 pilot leading three other aircraft at 1500 ft saw an object approximately three miles away at 1000 ft. Object appeared to be a flying wing thirty by twenty feet, silver in color. The pilot turned to intercept the object and the object turned on nearly the same course and disappeared from sight in five seconds. Object appeared to have a dorsal fin but distance was too great to note any other features. The report does not reveal whether any of the other pilots saw the object.

AMC Opinion: No definite explanation. However, every pilot has experienced the sensation of seeing an aircraft obliquely at nearly the limit of vision and then losing sight at the same range when the aircraft presented, in stern view, a smaller surface.

Incident No. 122 -- 5 April 1948, Holloman Air Force Base, New Mexico.
Three balloon observers saw an object very high in the sky, moving faster than any known aircraft and possessing a rounded indistinct form, which disappeared suddenly. It was seen less than thirty seconds and was apparently not manned, judging by its violent maneuvers. For analogous size they stated if the moon were the size of an orange the object would approximate the size of a disc.

ATIC Opinion: No explanation. However, the above comparison of size is to be noted. A dime held at arms length would shield the moon from the eye even if the moon appeared several times larger than it does. To reduce the proportion then, this object must have appeared as an infinitesimal point. From trained observers, this is certainly a major discrepancy.

Incident No. 154 -- 28 May 1948, 1500 Hours, Monroe, Michigan. One passenger in a C-47 at 8000 ft observed three disc-like objects and later two more (another observer saw only the two). The objects appeared to descend from above, level off at altitude of C-47 and travel in the opposite direction at freat speed. They left no trail, were disc shaped and were "silvery-gold" or "shiny brass" in color. One observer said they were 300-400 feet across with well rounded contours, the other said they were four feet in size. The first observer later said all had a hazy or fuzzy outline. There was an overcast at 15,000 feet and a thin, broken stratus layer at 3000 feet, the level of the aircraft.

AHC Opinion: Dr. Hynek suggests these individuals could have seen successive shafts of sunlight through breaks in the high overcast illuminating portions of the lower cloud stratum. Apparent speed could be a combination of projected motion of the break in the overcast and the velocity of the C-47. This explanation partially fits the contradictory evidence.

Incident No. 135 -- Between 15 and 20 August 1947, 2130 Hours, Weaver, South Dakota.

An Air Force Officer saw twelve "flying discs" four miles away over the Rapid City Air Force Base in a tight diamond formation at 8000 to 10,000 feet descending to 6000 feet at 500 MPH. Objects made a formation turn and climbed at 30° to 40° accelerating. Objects were very maneuverable, remaining equally spaced in all maneuvers. Each object was 100 feet in length, oval-shaped and brilliant yellowish-white. No sound nor exhaust trail were heard or seen.

AMC Opinion: This reporter should be a reliable observer. However, it has been shown that distance cannot be estimated without prior knowledge of the size of an object. If distance is not known, speed cannot be estimated. More notable perhaps is that such minute detail could be remembered in a report made one year after the observation and yet the date was not remembered. Dr. Hynek suggested the possibility of detached auroral streamers.

Incident No. 151 -- 29 July 1948, 0955 Hours, Indianapolis, Indiana.
The observers driving a truck saw an object shaped like a broad short propeller traveling 25-30 MPH in a bank just above the trees at thirty feet altitude. It was eight feet long, two feet wide and one foot thick, with "cups" on the upper sides of the blades. The object glided with no spinning action, and there was no sound or trail. The object was thought to have fallen, but a search revealed nothing.

ATIC Opinion: No satisfactory conclusion can be drawn.

Incident No. 152 -- 31 July 1948, 0825 Hours, Indianapolis, Indiana.
A man and his wife saw an object shaped like a cymbal, lusterless white in color, at an altitude of 2000 ft. The object moved across the sky to the east at approximately 1600 MPH, on a level course and shimmering in the sun, giving the appearance of spinning. It was twenty feet in diameter and six to eight feet high in the center. There was no sound or exhaust.

AMC Opinion: This object could conceivably be the same at different angles as that seen in Incident 151, although all the remaining evidence is widely divergent. No satisfactory conclusion can be drawn.

Incident No. 154 -- 2 August 1948, 1945 Hours, Columbus, Ohio
An attorney and his wife observed an object moving south over the center of Columbus at 1500-2000 ft altitude. During the ten to fifteen minutes the object remained in sight, it changed shape from that of a parellogram to a circle and back again, direction of travel remained constant. Once it seemed to hesitate and a thin trail of smoke appeared from the rear. The smoke disappeared soon. The outline of the object was dark gray or black, but the center seemed to be transparent. Object was judged to be 20 to 30 feet in diameter.

AMC Opinion: There is no reason to believe other than that this object was a research balloon, of which there are many types, and that the "trail of smoke" appeared so from a momentary glimpse of trailing apparati.

Incident No. 162 -- 11 August 1948, 1200 Hours, Hamel, Minnesota. Two children, ages ten and eight, described a dull gray object two feet in diameter and one foot thick, shaped like two plates together which settled gently to the ground. It clanked when it touched down. On the ground it emitted a whistling noise and "shot" up to twenty feet where it hesitated, whistled once more, "shot" up to thirty feet, then "shot" off in a northeast direction.

AMC Opinion: This apparent bit of fantasy is hardly worth further consideration.

Incident No. 168 -- 20 July 1948, 1330 Hours, Arnhem, The Hague.
One observer saw an object intermittently through clouds four times. The object had two decks and no wings, was said to be very high, with speed comparable to V-2.

AMC Opinion: Insufficient information. It may be well to point out that the V-2 is not visible in flight, therefore, it follows that this object would not have been visible as described if traveling at that speed.

Incident No. 176 -- 23 Sept. 1948, 1200 Hours, San Pablo, Calif. On a dull hazy day, two men saw a large translucent object over a mile overhead. It was the size of a four-engine bomber, buff-gray in color, and appeared to be made of canvas. According to the first observer, the center portion was spherical and undulated, having appendages fore and aft, like an amoeba. The second observer said the object looked like a "vegetable crate" covered with translucent material. The investigator states one observer's description was in direct contradiction to the other. One observer was far-sighted but wore no glasses, the other was over seventy, needed glasses to read but wore none at time of sighting.

AMC Opinion: The only fact that might be accepted is that an object was seen. Two observers, side by side, could not agree on its appearance. The evidence is useless. A balloon or cluster of balloons, an aircraft, or a cloud could have been the stimulus.



Incident No. 183 — 15 Oct. 1948, 2305 Hours, Fusnoka Area, Japan.
Airborne radar observer in F-61 attempted six times to intercept an object between 5000 and 6000 ft. The object traveled 200 MPH until approached to within 12,000 ft., then quickly accelerated from scope at estimated 1200 ft. Object appeared to be 20-30 ft long. Pilot saw silhouette on undercast of object with rounded nose, general projectile shape, cut off sharply at rear.

AMC Opinion: There is no apparent explanation. One discrepancy seems to be that the target was never seen by ground radar, which was operating and had the F-61 in sight throughout period of sighting.

Incident No. 186 -- 16 Oct. 1948, 1145 Hours, eight miles east of Sterling, Utah.
One observer on mountain at 9000 ft heard a throbbing noise, then saw one object 9 inches long, three inches thick, and six inches wide traveling horizontally at 300 MPH, 500 ft overhead. It was black with a wide silver stripe on underside center. Investigator states observer's ability to estimate distances is poor. In sight approximately four seconds.

AMC Opinion: Information indicates no explanation.

Incident No. 193 -- 24 Oct. 1948, between 1100 and 1330 GMT, Neubiberg, Germany.
An Air Force Officer heard a sound like an F-47 at high altitude, looked up and saw a dark object shaped like a coin at undetermined altitude, 60° elevation flying southwest at fast undetermined speed in level flight.

AMC Opinion: There is nothing to controvert the conclusion that this object was a conventional aircraft at a range outside the limit of visual resolution.

Incident No. 207 -- 15 Nov. 1948, 2200 Hours, Andrews Air Force Base, Maryland.
The pilot of a T-6 reported seeing an object over the base at 1700 feet. Object was an oblong ball with one light, no wings, no exhaust, in landing light of T-6. It had a dull gray glow and was thought to be smaller than the T-6. Pilot made passes and object evaded by going above aircraft. T-6 tried to close in very tight climbing turns, but object turned inside the aircraft. Object was lost after ten minutes at 7500 feet. Its speed seemed to vary between 80 MPH and 60 MPH.

AMC Opinion: That the object described was a synoptic balloon. Dr. Pitt's report shows that it is very difficult for the observer to separate target motion and his own motion even in daylight, and practically impossible to do so at night. This fact has been substantiated by the writer, who in controlled experiments attacked ordinary balloons with a T-6. In daylight, and with knowledge of what the object was and what it did, all the above described maneuvers were duplicated in appearance.

Incident No. 215 -- 3 Dec. 1948, 2015 Hours, Fairfield-Luisan Air Force Base, California.
The base control tower operator saw for 25 seconds a bright white light in the air. It came into view two miles away at 500 to 1000 ft, climbing slowly at 400 MPH; at 1500 ft it slowed for a few seconds to 200 MPH; at this time, it undulated or bounced; rose vertically to 3000 ft and immediately afterwards climbed quickly to 20,000 ft and was lost to sight.

AMC Opinion: There is no logical explanation for this incident that fits the available evidence.

UNCLASSIFIED [redacted]

Incident No. 236 -- 4 Jan. 1949, 1400 Hours, Hickam Field, Territory of Hawaii.
An Air Force pilot saw an object which appeared to be a large round piece of flat cardboard the size of a T-6. It was white underneath and dark on top. It approached from 25 mile distance at 3000 ft and circled the area at 65. The object seemed to "blink" a "whitish reflection" regularly. It departed climbing at 25° angle.

ATIC Opinion: The evidence does not lead to an explanation. It should be noted, however, that if the object were actually the size of a T-6 at 3000 feet a greater amount of detail should have been observed.

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RETURN TO
USAF Historical Archives
ASI(ASHAF-A)
Maxwell AFB, Ala 36112

Project Twinkle

Study of fireballs in Southwestern states of U.S. This project is part of Project Grudge.

SECRET

PROJECT TWINKLE
Project TWINKLE - Pt. of Proj. GRUDGE
7-3745 - 500
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It is a well known fact that the Russians have been hard at work on several urgent projects to study 'fireballs'. Many years ago the Air Force concluded a study of the mysterious 'green fireballs' in the Southwestern states in the U.S.A. It was called 'PROJECT TWINKLE', but its findings have never been revealed.

PROJECT CONTROL RECORD

PROJECT NO. 2-251

SUBJECT

Project Twinkle with 2 Incls.

DEADLINE	DATE RECEIVED
4 Mar 52	25 Feb 52

ORIGINATED BY

AFDRD

ACTION BRANCH	BRANCH PROJECT OFFICER
TC	

REQUIREMENT

Preparation of R&R #2 to AFDRD from Directorate of Intelligence.

PROPOSED APPROACH

Routine

ACTION TAKEN

Prepared R&R 2 to AFDRD

RECOMMENDED FURTHER ACTION

None

MAN HOURS REQUIRED

2 hrs - Capt Fournet
20 min - Miss Overstreet
20 min - Miss Bryan

DATE FORWARDED	APPROVED BY

AFHQ FORM 0-553
28 JUN 51
C 1437

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

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K243.601
51/11/27
RETURN TO:
Director
Aerospace Studies Inst
ATTN: Archives Branch
Maxwell AFB, Alabama

PROJECT TWINKLE

FINAL REPORT

L. ELTERMAN

27 November 1951

SMC

APPROVED:

1. TWINKLE, Project

P. H. WYCKOFF
Chief, Atmospheric Physics Laboratory

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DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

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ABSTRACT

Early in 1950 the Geophysics Research Division received a directive to investigate peculiar light phenomena that had been observed in the skies of the southwestern United States. Project Twinkle was established to check into these phenomena and their explanation.

The gist of the findings is essentially negative. The period of observations covers a little over a year. Some unusual phenomena were observed during that period, most of them can be attributed to such man-made objects as airplanes, balloons, rockets, etc. Others can be attributed to natural phenomena such as flying birds, small clouds, and meteorites. There has been no indication that even the somewhat strange observations often called "Green Fireballs" are anything but natural phenomena.

Our recommendations are in essence that there is no use in sinking any more funds into this at the present time and that we will keep in connection with one of our meteor studies a sharp eye on anything unusual along this line.

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1. Background

In accordance with instructions contained in a classified letter from Chief of Staff, USAF to CG, AMC, subject "Light Phenomena", on 14 September 1949, Lt. Col. Frederic C.E. Oder of CRD attended a conference at Los Alamos, 14 October 1949 on the subject of "Green Fireballs" observed in the Northern New Mexico area. Since the phenomena had been observed only in this area and only since 1947, it had caused considerable concern among security agencies in the area. It was the conclusion of the scientists present at this meeting that the information available was not sufficiently qua[redacted]tive. Instrumental observations - photographic, triangulation, and spectroscopic were considered essential.

Dr. L. La Paz of the Department of Meteoritics of Univ. of New Mexico was present at the Los Alamos meeting and subsequently was invited to submit proposals for studying this phenomena under GRD sponsorship. On 2 February 1950, Dr. La Paz advised that due to difficulties with academic arrangements, he was unable to undertake this study.

During February 1950, the frequent reports of unexplained aerial phenomena in the vicinity of Holloman Air Force Base and Vaughn, New Mexico prompted the Commanding Officer of Holloman Air Force Base to initiate a program to gather factual data.

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These data then would be used to demonstrate the need for initiating a study of the phenomena. On 21 February 1950, an observation outlook post was set up at Holloman Air Force Base manned by two personnel. Observations with theodolight, telescope and camera were undertaken between the hours of sunrise and sunset.

On 5 March 1950 a conference was held at Wright-Patterson Air Force Base which included Holloman Air Force Base and GRD personnel. Action was taken to initiate a three point program which was confirmed by AMC in the form of a letter directive on 16 March 1950, subject "Light Phenomena".

a. Askania instrument triangulation by Land-Air Inc.

b. Observations with Mitchell camera using spectrum grating by Holloman Air Force Base personnel.

c. Electromagnetic frequency measurements using Signal Corps Engineering Laboratory equipment.

Under contract to GRD, Land-Air Inc. was required to maintain constant watch at two Askania stations for a six-month period. Since an abnormal number of reports had been received from Vaughn, New Mexico, it was decided to install the instrumentation at Vaughn.

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2. Contractual period - 1 April 1950 to 15 September 1950.

Some photographic activity occurred on 27 April and 24 May, but simultaneous sightings by both cameras were not made, so that no information was gained. On 30 August 1950, during a Bell aircraft missile launching, aerial phenomena were observed over Holloman Air Force Base by several individuals; however, neither Land-Air nor Project personnel were notified and, therefore, no results were acquired. On 31 August 1950, the phenomena were again observed after a V-2 launching. Although much film was expended, proper triangulation was not [redacted], so that again no information was acquired. On 11 September, arrangements were made by Holloman AFB for Major Gover, Commander 93rd Fighter Squadron at Kirtland AFB, to be on call so that aerial objects might be pursued. This would make possible more intimate visual observation and photography at close range. Major Gover was not authorized to shoot at the phenomena.

Generally, the results of the six-month contractual period may be described as negative. Although the photographic theodolites functioned continuously, the grating cameras functioned very little, since the military personnel assigned to operate them had been withdrawn due to the needs concerned with the Korean situation. The

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facilities for the electromagnetic frequency measurements that were to be provided by the Signal Corps Engineering Laboratories were not utilized due to the fact that the frequency of occurrence of these phenomena did not justify the $50,000 a year transfer of funds to the Signal Corps which would be required to carry out such a monitoring facility. However, the phenomena activity over Holloman AFB 150 miles south of Vaughn, N. Mexico during the latter part of August 1950 was considered sufficiently significant so that the contract with Land-Air (Askania cameras only) was extended for six months ending 31 March 1951.

3. Contractual Period - 1 October 1950 to 31 March 1951

Because of the diminution of phenomena activity in the vicinity of Vaughn and the resumption of activity near HAFB, the Askania cameras again were overhauled and installed at HAFB. This installation was completed about 5 November 1950. On 16 October 1950, arrangements were made by Lt. Albert of HAFB that Northrup Aircraft pilots engaged in frequent flying of B-45 and QF-80 aircraft in the Holloman vicinity would report all observations of aerial phenomena.

During this period, occasional reports were received of individuals seeing strange aerial phenomena, but these reports were sketchy, inconclusive, and were considered to be of no scientific value. No sightings were made by the Askania cameras. Nothing whatsoever was reported by the Northrup pilots. Popular interest seemed abated, at least in the southwest. On 31 March 1951, due to the expiration of the contract, Land-Air ceased constant vigilance at the two Askania stations. In summary, the results during this period were negative.

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4. Post Contractual Inquiry

In view of the unproductive nature of the contract with Land-Air, it was decided to make further inquiry concerning recent aerial object developments in New Mexico. On 9 August 1951, the situation was discussed with Lt. Col. Cox of the 17th OSI District (Kirtland AFB). Until 15 March 1950 the District had been diligent in forwarding copies of their reports on aerial object phenomena. Since then, no reports have been received by the Geophysics Research Division. Colonel Cox advised that reports of strange aerial phenomena were still received by the 17th OSI office, at the rate of once or twice a month but little attention was being given to this matter. Most of the reports originated from personnel at Los Alamos. The OSI files were reviewed. (A summary covering recent reports is attached.) It was learned that representatives from LIFE and also from ARGOSY were interested in publishing articles on aerial object phenomena.

On 27 August 1951, developments concerning aerial phenomena were discussed at Holloman AFB. Lt. John Albert previously associated with the project had now been transferred from Holloman. Therefore, the project was discussed with Major Edward A. Doty who had assumed responsibility. Major Doty, who seemed to be thoroughly acquainted with the situation, advised that there have been very few reports of

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aerial phenomena in the vicinity of Holloman since September 1950. The populace around HAFB seem to have lost their sensitivity as observers. Even during the meteor shower of 11-12 August 1951, no alarming reports were received. However, on 14 March 1951, nine Bell personnel reported sighting between fourteen and twenty bodies "not unlike a flock of geese". On 9 July a "red glowing ball" was sighted by a sergeant stationed at the Corona Experimental Radar Site at Corona, New Mexico. (Copies of both reports are attached). More recently, a pilot reported some aerial objects which, after investigation, were identified as planets.

Mr. B. Guildenberg, who is an assistant to Major Doty and an active amateur astronomer, commented that he has been spending several hours at his telescope almost every night for the past few years and never once observed an unexplainable object; that on one occasion, an excited acquaintance was pacified when a "strange object" showed up as an eagle in the telescope; that Clyde Tombaugh, discoverer of the planet Pluto and now engaged in activities at White Sands, never observed an unexplainable aerial object despite his continuous and extensive observations of the sky; that Fred Whipple in his work photographing meteors at Las Cruces, never detected a strange aerial object with his Schmidt cameras; and that the A and M College at Las Cruces engages in astronomical observations but had never observed strange aerial phenomena.

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It was learned from Major Doty, that Col. Baynes, C. O. at HAFB, no longer felt there was any justification for the allocation of funds for maintaining systematic investigation. Rather, he provided that the project be maintained on a standby basis and without official Air Force status. This entails assignment of an officer (Major Doty) to collect incoming reports, make periodic review of the files "for patterns or persistent characteristics in the reports", maintain liaison with OSI, Provost Marshall's Office and any other agencies whose activities may serve to provide information concerning future aerial phenomena developments. Land-Air has agreed to report and if possible photograph any abnormal sightings made during their scheduled periods of operation (about eight hours each day). The weather station will function similarly. Also, all pilots have been briefed to report any unusual observations. If necessary, the project can be activated very quickly, even to the extent where funds will be made available, for the purchase of equipment.

Major Doty also arranged a conference with Mr. Warren Kott, who is in charge of Land-Air operations. Mr. Kott pointed out that a formal report covering the year's vigilance period had not been issued since the contract contained no such provision. Actually, a time correlation study should be made covering the film and verbal recordings at both Askania stations. This would assure that these records did not contain significant material. However, such a study is quite laborious, and would require about thirty man days to complete. Again, no provisions are contained in the contract for this study, but Mr. Kott felt that

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this could be done by Land-Air at the additional expense in the near future when the work load diminished. Mr. Kott requested formal authorization to do this and Major Doty agreed to issue this letter of authorization. It was arranged further that at such time when the study is completed all photographic and tape recordings would be sent to the Geophysics Research Division. Prior to departing HAFB, the project files were reviewed. Major Doty advised that access to the files had not been requested by any periodicals.

On 28 August 1951, the subject was discussed informally with Dr. Lincoln La Paz, who expressed disbelief in all aerial phenomena except for the green fire-balls. The red fire-ball occasionally reported he believed was the visual after-effect of the green. Their recent origin (1947) and peculiar trajectories did not permit, according to Dr. La Paz, them to be classed as natural phenomena. The most recent that has come to his attention occurred over Detroit on 7 July 1951. It crossed the city from Northwest to Southeast with a sharply descending trajectory which leveled out and was observed by many residents of the city. Dr. La Paz expressed the opinion that the fireballs may be of our own military origin, but if not, they are a matter of serious concern.

5. Conclusions

Undoubtedly, a good many of the observations reported are attributable to ordinary man-made objects such as airplanes, balloons, smoke rockets, etc. It appears that balloon observations especially are responsible for a large number of the reports. The possibility of small

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emissive clouds issuing from atomic installations also has been proposed.

Many of the sightings are attributable to natural phenomena such as flight of birds, planets, meteors, and possibly cloudiness. Dr. Fred L. Whipple of Harvard, in a memorandum to this laboratory dated 9 August 1950 relative to this problem, indicated that he had observed a tendency for the occurrence of small detached clouds in New Mexico which might have been mistaken for an aerial object when illuminated by the reflected light of the moon. Dr. Whipple investigated the possibility of a correlation between the frequency of aerial phenomena observations and weather conditions -- specifically cloudiness. A rough analysis of available weather data, indicated that on the 53 nights (between 5 December 1948 and 5 March 1951) when observations were reported, 10 were clear, 24 partially cloudy, 5 completely overcast and 14 had no record. The number of cloudy nights involved seems unusually high for New Mexico. The weather reports were for the Las Cruces Area only whereas many of the observations were a considerable distance from Las Cruces. Further investigation is therefore necessary to determine correlations with cloudiness.

Dr. Whipple also conducted a study as to whether the age of the moon was related to the frequency of aerial phenomena observations. The results did not indicate that the phenomena were observed largely at full moon. The statistics show that of the 72 observations reported, 45 occurred when the moon was up and 27 when it was down with many of the observations occurring at the time of the moon's first quarter. From the statistical study, Dr. Whipple suggests that the existence of moonlight is correlated with the phenomena. Dr. Whipple's frequency diagram of observations vs. age of moon is included in this report.

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It should be noted that Dr. Whipple made a careful study of meteor photographs taken in New Mexico on 35 nights when observations were reported. None of the photographs revealed the presence of unusual sky phenomena.

Finally, the overall picture obtained from the year of vigilance and inquiry does not permit a conclusive opinion concerning the aerial phenomena of interest. The comparatively high incidence of the phenomena since 1948 does not necessarily indicate that the objects are man-made. It is conceivable that the earth may be passing through a region in space of high meteoric population. Also, the sun-spot maxima in 1948 perhaps in some way may be a contributing factor.

6. Recommendations

Since the findings to date cannot be considered conclusive, it appears that the following recommendations would be pertinent:

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(1) No further fiscal expenditure be made in pursuing the problem. This opinion is prompted partly by the fruitless expenditure during the past year, the uncertainty of existence of unexplainable aerial objects, and by the inactive position currently taken by Holloman AFB as indicated by the "stand-by status" of the project. The arrangements by HAFB for continued vigilance by Land-Air, the weather station as well as the briefing of pilots on the problem in part relieves the need for a systematic instrumentation program.

(2) Within the next few months, Dr. Whipple will have completed the installation of two 18-inch Schmidt cameras for meteor studies. The cameras will be stationed about 20 miles apart in the vicinity of Las Cruces, New Mexico. Since these studies will be sponsored by the GRD, arrangements can be made for examining the film for evidence of aerial object phenomena.

LOUIS ELTERMAN
Project Scientist
Atmospheric Physics Laboratory
Geophysics Research Division

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Summary of Recent Aerial Phenomena Reports from 17th OSI District

11 Nov. 1950 - Reports of a large-sized balloon. It was determined that this was released by General Mills. The balloon subsequently was recovered.

13 Jan. 1951 - Report from ten Los Alamos employees. Tear shaped object with small tail; very bright appearance; descended slowly; sky lighted up for about 1 sec; observation time 05:00. Unconfirmed sighting flare dropped by military pilot who mentioned Los Alamos

16 Feb. 1951 - Aerial object reported in the vicinity of Holloman AFB. This turned out to be a General Mills balloon functioning for Project "Skyhook".

19 Feb. 1951 - A C-54 pilot reported a green flare or rocket observed in the vicinity of Rodeo, N.M. Its motion was vertical and passed the plane at 9000 ft. Investigators believed this to be a meteor.

6 Mar. 1951 - Report from four Los Alamos personnel of very bright object crossing sky. Also observed by two Kirtland AFB pilots who reported this as a meteor; time - 14:30; reported by Dr. La Paz to be a detomating fire-ball. No fragments recovered.

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12 Mar. 1951 - Report from Albuquerque, N.M. by two individuals of ball-shaped object, shining-white appearance. The object descended rapidly to the horizon.

1 April 1951 - Report from a Los Alamos employee. Oblong shaped object moving slowly both in horizontal and vertical directions. Bright appearance.

7 June 1951 - Report from a Los Alamos employee. Pointed cylinder in vertical position. Cloth-like construction. Fell in canyon at 11:10 A.M. Search party was unable to find the object or any remains.

8 June 1951 - Report from a Los Alamos employee. Large reddish dot, dull appearance which turned bright green. Observed for three seconds.

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AIR MAIL

R-114-168

11 Dec 1951

CRNTO

SUBJECT: Transmittal of Final Report of Project Twinkle

TO: Director of Research and Development
Headquarters, USAF
ATTN: AFDRD-RE, Colonel John Tucker
Washington 25, D. C.

1. Inclosed is a copy of the Final Report on Project Twinkle, forwarded at your request.

2. As there is interest in this matter outside of the Department of Defense, we have recommended to Hq., ABDC, that consideration be given to its declassification, particularly in view of the fact that nothing of a security nature has been discovered.

FOR THE COMMANDING GENERAL:

1 Incl
a/s

EPHRAIN RADNER
Chief, Operations Section
Plans and Operations Branch
Geophysics Research Division

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14

Extract of Letter from AFCRL, dated 15 September 1950, Subject: Status of Project Twinkle

TO: Commanding General
Air Materiel Command
Attn: MCREEP-4 Major J. W. Kodis
Wright-Patterson Air Force Base, Dayton, Ohio

"If no fire balls are observed in the next six month period, it is recommended that the project be discontinued. In a phenomenon as sporadic as the fire balls appear to be, it is felt that at least one year is required in order to establish whether their occurrence is or is not a seasonal phenomenon.

4. There is considerable doubt in the minds of some of the project personnel that this is a natural phenomenon. As long as a reasonable doubt exists, it is not wise to discontinue entirely the observations. Dr. Whipple s suggestion that these may be moon reflections on small clouds cannot be discounted. That fire balls have been observed in the past cannot be discounted due to the reliability of several witnesses. It may be considered significant that fire balls have ceased abruptly as soon as a systematic watch was set up. At present it does not appear likely that the next six months of observations will yield any more information than the first six months, but it is felt that even negative information may be significant.

5. It is requested that a six month extension of the Land Air contract be negotiated. It is also requested that the spectrographic equipment abandoned by Holloman Air Force Base due to lack of personnel be turned over to Land Air for operation in the next six month period. At the conclusion of the six month extension, an evaluation of the observations will be accomplished by this Directorate and recommendations as to the future conduct of this project will be forwarded to your command."

COPY

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Bas Ltr fr Hqs, AMC, Wright-Patterson Air Force Base, Dayton Ohio
dtd 9 December 1949, Sub: Light Phenomena

2nd Ind.

Hq AMC, Wright-Patterson Air Force Base, Dayton, Ohio 17 May 1950

TO: Director of Research and Development ,Hq, USAF, Washington 25, D. C.
ATTN: AFMRS-4

1. Since the date of basic correspondence this Command has been able to initiate subject project on a limited basis utilizing personnel and equipment which have become available at Holloman Air Force Base. For your information the investigation involves the following observational techniques:

a. Optical tracking with Askania photo theodolites in order to provide trajectory data and photo records.

b. Optical spectro-photography using standard cameras with suitable diffraction gratings.

c. Radio spectrum analysis through the range from 500 kc to 4000 mc. This portion of the program will be shortly started with the Signal Corps providing equipment and personnel.

2. The request of this Command as contained in Paragraph 2 of basic correspondence is withdrawn. In view of this, prior RDB approval for the project is not believed necessary. This Command will take action to coordinate the project through normal channels.

3. In order to better evaluate the results of the investigation outlined in Paragraph 1 above, it would be very desirable to have the activities of the 17th District OSI at Kirtland Air Force Base re-initiate in making field investigations of light phenomena reports. Such reports would be important in the verification of any results of the project work at Holloman. It is therefore requested that action be taken for re-initiation of the 17th District OSI investigations for the period of this project.

FOR THE COMMANDING GENERAL:

S, R, BRENTNALL
Major General, USAF
Director,
Research and Development

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2nd endorsement

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Bas Ltr fr Hqs AMC, Wright-Patterson Air Force Base, Dayton, Ohio
dtd 9 December 1949, Sub: Light Phenomena

AFMRS-4 1st Ind
Department of the Air Force, Hq., USAF, Wash. 25, D. C. 20 December 1949

TO: Commanding General, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio

1. This headquarters concurs in the establishment of a project within the Air Force Geophysical Research Program in order to further investigate and secure quantittative data on the "Light Phenomena" observed in the Southwestern United States.

2. Prior to securing the approval of the Research and Development Board and accomplishing the necessary reprogramming within the Geophysical Sciences Budget, it will be necessary for you to prepare a project plan. This plan should include a statement of the problem, method of accomplishment, money, facilities and personnel required to make the necessary measurements. The funds requirement should be stated by object classification.

3. When this necessary information has been received from your command, this headquarters will take appropriate action to secure Research and Development Board approval. As soon as an approval is forthcoming, your command will be requested to initiate the project.

BY COMMAND OF THE CHIEF OF STAFF:

Incls.
w/d

B. G. HOLZMAN
Colonel, U.S.A.F.
Chief, Geophysical Sciences Branch
Directorate of Research & Development
Office, Deputy Chief of Staff, Materiel

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1st endorsement

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HEADQUARTERS
AIR MATERIEL COMMAND
Wright-Patterson Air Force Base
Dayton, Ohio

MCGO 9 December 1949

SUBJECT: Light Phenomena

TO: Director of Reseach and Development
Headquarters, USAF
Washington 25, D. C.

1. Reference is made to:

a. Headquarters USAF (AFMRS-4) letter, dated 14 September 1949, Subject: "Light Phenomena." (See Inclosure No. 1.)

b. Cambridge Research Laboratories letter, dated 7 November 1949, subject: "Report of Conference on "Green Fireballs" (Project Grudge)." (See Inclosure No. 2.)

2. A report of the conference held at Los Alamos on the subject of phenomena observed in the New Mexico area is forwarded as inclosure No. 2. Inasmuch as the phenomena appears to be atmospheric in nature, it is recommended that the investigation continue under the Air Force Geophysical Research program. In order to establish such a project it is requested that Research and Development Board approval be accomplished and that necessary funds be provided.

FOR THE COMMANDING GENERAL:

/s/ M. B. Lammers
M. B. LAMMERS
Technical Assistant
Deputy to the Command General
for Operations

Incl:
1 - See par 1a abv
2 - See par 1b abv

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Basic Letter

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AIR FORCE CAMBRIDGE RESEARCH LABORATORIES FCEO/epa

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In reply, address
Commanding Officer.
Attn: ERH

230 Albany Street
Cambridge 39, Mass
7 November 1949

SUBJECT: Report of Conference on "Green Fireballs" (Project Grudge)

TO: Commanding General
Air Materiel Command
Wright-Patterson AFB
Dayton, Ohio
ATTN: MCREEO, Major G.H. Duncan

1. In accordance with instructions contained in classified letter from Chief of Staff, USAF to CG, AMC, subject "Light Phenomena," 14 September 1949, the undersigned attended a conference at Los Alamos on the subject of a phenomena observed in the northern New Mexico area. The phenomena has the appearance of a green fireball and because of the fact that it has been observed only (as far as can be determined) in the northern New Mexico area and only since the year 1947, has caused a high degree of apprehension among security agencies in the area. Two reports from the 17th District Office of Special Investigations (inclosures 1 and 2) summarizes present information on the phenomena. In view of the fact that the phenomena has been observed by independent and trained observers there is little doubt that something was actually observed.

2. Inclosure 3 lists those personnel attending the conference.

3. The first part of the conference was devoted to a summary presentation of all collected and organized observational information regarding green fireballs. The presentation was made by Dr. Lincoln LaPaz (Professor and Head of Department of Meteroritics and Mathematics, University of New Mexico) and Capt. Melvin E. Neef (17th District OSI, USAF). Dr. LaPaz has been cooperating with the OSI investigators in the matter at their request and on an unpaid basis. Capt. Neef is the principal OSI agent on the case. Both Dr. LaPaz and Capt Neef have personally and independently observed the phenomena.

4. The second part of the conference was a discussion by the scientists present of various possible explanations and hypotheses concerning the phenomena. Little success was had.

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Ltr ERH to CG, AMC, Subj: Report of Cofference on "Green Fireballs" (Project Grudge)

5. It was the conclusion of the group present at the meeting that the present information on the phenomena was not sufficiently quantitative and objective to allow any profitable scientific consideration. Instrumental observations (especially photogaphs, triangulation, and spectroscopic) were considered as essential.

6. Dr. Joseph Kaplan, who was officially representing the Scientific Advisory Board, USAF at the meeting, plans to report the problem to the next meeting of the Board (2 and 3 November)1949) with the recommendation that the USAF provide a suitable investigation of the phenomena using the Geophysical Research Directorate, Air Force Cambridge Research Laboratories, AMC as the agency for the project.

7. It is the opinion of this office that the Geophysical Research Directorate, AFCRL, is capable of performing the required investigation (by photographic and spectroscopic means) provided that necessary funds, personnel authorizations and equipment are provided. Inasmuch as the phenomena appears to be atmospheric in nature, such an assignment is considered appropriate.

FOR THE COMMANDING OFFICER:

3 Incls:
1. Summary #1
2. Summary #2 (in dup)
3. Personnel at mtg

/s/ Frederic C. E. ODOR
Major USAF
Acting Director
Base Directorate for
Geophysical Research

cc: Major D. Crowson, Hq USAF

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enclosure #2

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DOD DIR 5200.10

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[redacted] Auth: C.G., AMC
Initials:_____
Date:_____

MCGO

SUBJECT: Light Phenomena

TO: Director of Research and Development
Headquarters USAF
Washington 25, D.C.

1. Reference is made to:

a. Headquarters USAF (AFMRS-4) letter, dated 14 September 1949, subject: "Light Phenomena." (See Inclosure No. 1).

b. Cambridge Research Laboratories letters, dated 7 November 1949, subject: "Report of Conference on 'Green Fireballs" (Project Grudge)." (See Inclosure No. 2).

2. A report of the conference held at Los Almos on the subject of phenomena observed in the New Mexico area is forwarded as inclosure No. 2. Inasmuch as the phenomena appears to be atmospheric in nature it is recommended that the investigation continue under the Air Force Geophysical Research Program. In order to establish such a project it is requested that Research and Development Board approval be accomplished and that necessary funds be provided.

FOR THE COMMANDING GENERAL:

Incl:
1 - See par 1 a abv
2 - See par 1b abv

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Copy of basic letter

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C O P Y UNCLASSIFIED

AFMRS-4

SUBJECT: Light Phenomena 14 September 1949

TO: Commanding General
Air Materiel Command
Wright-Patterson AFB
Dayton, Ohio

1. Since the establishment of the special project at Hq AMC, (Project GRUDGE), to investigate and analyze reports on so-called "Flying saucers" and unidentified aerial phenomena, many reports have been received through intelligence channels from persons who have observed what they considered to be unusual light phenomena. Foremost in this category have been those which are described as "green fireballs".

2. Analysis by various specialists has indicated that many of the incidents involving light phenomena were undoubtedly observations of natural phenomena. Particular attention was given to the "green fireball" variety by Dr. Joseph Kaplan, member of the USAF Scientific Advisory Board. Dr. Kaplan has concluded that the "green fireballs" are natural phenomena.

3. Correspondence relative to Dr. Kaplan's conclusions on the phenomena and correspondence relative to a request from the Second Armored Division, Camp Hood, Texas, for scientific investigation of similar phenomena, are forwarded for your information.

4. The Air Materiel Command has under contract several organizations in the Boston area that are specialists in observing techniques and the interpretation of celestial phenomena. It is desired that these organizations be consulted regarding the "green fireball" phenomena. If necessary, consideration should be given to the establishment of an observational program designed to obtain additional information necessary to an explanation of the phenomena.

5. A meeting at Sandia in the New Mexico area is scheduled for the middle of October to continue discussions of the light phenomena. It is requested that representatives from Air Force Research Laboratories, Base Directorate for Geophysical Research attend.

6. This Headquarters should be apprised of the progress of the evaluation and the results of the Sandia meeting as soon as possible.

BY COMMAND OF THE CHIEF OF STAFF:

[redacted]

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3 Incls:
1-4th Ind to GSUSA w/bltr & Incls (cy) dtd 9/1/49
2-Cy ltr to Dr Kaplan dtd 8/9/49
3-Cy ltr fm Dr Kaplan dtd 7/31/49 w/incls

enclosure 1

/s/ JOHN McK. TUCKER
Lt Col, USAF
Actg Chief, Geophysical Sciences Br
Directorate of R&D
Office, DCS/M

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

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(UNCLASSIFIED) Project TWINKLE

Directorate of Intelligence
Attention: Colonel John G. Ericksen, Chief
Technical Capabilities Branch
Research Division, Directorate of Research and
Development, Office, DCS/Development

19 Feb 1952
1
Lt Col Clayton/djh/52497
AFDRD-RE

1. Attached is a copy of a letter from the Air Research and Development Command requesting declassification of Project TWINKLE, a project which was carried out by AMC and ARDC for investigation of unusual light phenomena in the general area of Holloman Air Force Base and Vaughn, New Mexico.

2. The Scientific Advisory Board Secretariat has suggested that this project not be declassified for a variety of reasons, chief among which is that no scientific explanation for any of the "fireballs" and other phenomena was revealed by the report and that some reputable scientists still believe that the observed phenomena are man-made.

3. In view of the great interest of the Directorate of Intelligence in such phenomena and the related manifestations, evaluation of the final report of Project TWINKLE with a view to its declassification is requested.

2 Incls
1. cy ltr fr ARDC to Hq 14 Jan 52
2. cy of Proj TWINKLE Final Report

ALBERT E. LOMBARD, JR.
Chief, Research Division
Directorate of Research and Development
Office, Deputy Chief of Staff, Development

JOHN H. CLAYTON
Lt Colonel, USAF

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PROJECT " TWINKLE"

SOURCE: CRIFO Newsletter, 3 Feb 56

PROJECT TWINKLE—UNDER ITS [illegible]
THE KEY?

Speculatively, we see a connection between the earth-[illegible] and the fireballs' [illegible] moon or Mars, then it should be equally reasonable to assume that the same operations are practicable in reverse. But trading the moon or Mars as the [illegible] launching base is a far simpler matter than [illegible] its objectives, for the only pattern recognizable is the very fact of pattern! Like the "artificial moons" [illegible] moon, they may be relatively harmless [illegible] test the earth's anatomy of air. Such testing [illegible] logically account for the fireballs' patternless [illegible] behavior. Yet, other theorists aver the fireballs are tied to certain geographical areas such as the Southwest, which does evince a pattern, while [illegible] tests may have been prior to the Southwest. [illegible] fireballs since that period have been spontaneous [illegible] and without [illegible] witnessed today were in turn, [illegible] tests, spontaneous [illegible] 46. Finally, then the final point, [illegible] their purpose was to test and/or observe [illegible] of its radioactive poisons; but today, with [illegible] tests and the widespread contamination [illegible] the "solution" of the fireball may have become [illegible] urgent! However, we have one contradictory [illegible] possible [illegible] all [illegible]

Still guessing, but coming closer [illegible] we may also perceive in the fireball's [illegible] mere, the stark possibility that it may be [illegible] missile, a theory to which Major [illegible] scribed. Such a device would explain the [illegible] bombardments, and the occasional [illegible] particular areas such as the Baltic and New Mexico. [illegible] over the objective of this ranging device, whether [illegible] experimental, retaliatory or something far [illegible] intelligible to our thinking, we feel that in our [illegible] we should also take cognizance of the [illegible] with Air Force approval, which appeared in [illegible] zine, June 1952. Under the title, *Have You Met the Saucer*, it said in part, "Especially puzzling have been the horizontal-flying 'green fireballs'. . . Another [illegible] of the Air Force, the Air Research and Development Command, with headquarters in Baltimore and laboratories in Boston, has been studying them in a secret project called Project Twinkle. Although work on this project has been completed, the ARDC refuses to make public its findings. . . . Some Air Force officials feel the inconclusive Project Twinkle report will never be made public; they won't explain why. Some suggest it would expose a foul-up."

Is it conceivable that this *foul-up* could be in reference to the inadvertant artificial meteor program, and that Project Twinkle had learned that fireballs were simulatory ranging missiles? Was Dr. Lincoln La Paz, well-[illegible] meteoriticist, alluding to the interplanetary ranging missile when he said on September 13, 1952 that a "shrewd opponent" could wage an ice cube war against this country? Said La Paz, "It is for this reason that since 1948, representatives of the Institute of Meteoritics have habitually asked observers of the yellow-green fireballs and other anomalous luminous phenomena whether or not pieces of ice or drops of water were detected falling from the sky at the time of the observed incident."

But, whether the missile is made of ice or of a [illegible] content, such action does not, we repeat, mean "interplanetary war" but it may be the reason for the USAF being [illegible] concerned. If such [illegible]

[illegible] it is also [illegible] why the Air Force [illegible] reportedly denied [illegible] for transmission [illegible] wire and [illegible] planetary guided [illegible] would [illegible] into revealing other [illegible] such as that earlier steps of Project Twinkle or [illegible] 128 or the [illegible] disaster of July 19, [illegible] of [illegible] fatalities.

[illegible] was military is still under the [illegible] the [illegible] Major [illegible] C. Wilson, of the Dallas [illegible] [illegible] [illegible]

RETURN TO
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Historical Research Center
Maxwell AFB, AL 36112

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AND

SPECIAL REPORTS

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[redacted]

UNCLASSIFIED

[redacted]

Classification cancelled
~~or changed to~~ [redacted]

AUTH: ROBERT J. FRIEND, MAJOR, USAF
By Robert J. Friend, Maja (AFR 205-1D, par 2-17)
Signature and Grade

Date 9 SEPT 1960

RETURN TO
The Albert F. Simpson
Historical Research Center
Maxwell AFB, AL 36112

ATTN: Archives Branch
Maxwell AFB, Alabama

K243.6012
51/10/22-
53/09/30

STATUS REPORT NO. 1

PROJECT GRUDGE

30 November 1951

SMC

Classification cancelled
~~or changed to~~ [redacted]

AUTH: ROBERT J. FRIEND, MAJOR USAF
By Robert J. Friend, Maja
Signature and Grade

Date 9 SEPT 1960

AIR TECHNICAL INTELLIGENCE CENTER
WRIGHT-PATTERSON AIR FORCE BASE
DAYTON, OHIO

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T32-13365

[redacted]

UNCLASSIFIED

Classification cancelled
or changed to [redacted]
AUTH: ROBERT J. FRIEND, MAJOR USAF
By Robert J. Friend, Major
Signature and Grade
Date 9 SEPT 1960

This report is the first of a series of monthly status reports of Project Grudge. Each report will be written on or near the last day of the month and will contain a list of all incidents reported during the month covered by the report. The reports that are considered to be outstanding will also be summarized in the appendices of the report so that more details can be presented. The overall status of the project will also be presented.

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T52-13365

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STATUS OF PROJECT GRUDGE

I. Overall Status

Much of the work done on Project Grudge has been devoted to the reorganization of the project as given in the Project Initiation Form A-3, dated 22 October 1951.

The old Project Grudge and Project Sign files have been reviewed and sorted. Cross-indexing and tabulation of the old files has been slow due to a lack of clerical help, but it is hoped that this situation will be alleviated in the near future. It is contemplated that all of the sightings of unconventional flying objects will soon be cross-indexed according to size, color, location, etc., so that as much statistical data as possible will be available. It is believed that it may be possible to determine several general characteristics of the sightings from the mass of data that is on file at ATIC.

Contacts have been established with all agencies that may be able to assist in Project Grudge such as Air Weather Service, Flight Service, high altitude balloon projects, O.S.I., etc. There is still some doubt as to the channels that should be used in contacting some agencies but these will be clarified in the near future.

Two major difficulties have arisen and they are (1) the time element and (2) obtaining transportation. In regard to the time element, it has been found that in many instances one or two months will elapse before ATIC receives word on an incident. It is very possible that many incidents are never reported. As far as can be determined, this is due to two main reasons:

a. Letters pertaining to the procedures and responsibilities in reporting incidents were dated September 1950. Since that time there has been an influx of new and recalled officers and changes in personnel; consequently, a great number of people are not aware of the requirements of Project Grudge. Incidents that are several months old are finally received at ATIC after having forwarded through several commands.

b. It is believed that the general feeling in some instances is that the Air Force is not too interested in this project and reporting such incidents is unimportant. It is the opinion of ATIC that regardless of personal beliefs as to the origin of the objects, the task of determining, if possible, what these objects are has been assigned, and should be carried out.

It is believed that the revision and re-circulation of the AF letter pertaining to Project Grudge will alleviate the problem of delay in receiving reports. The Collection Division, Directorate of Intelligence, was requested to revise and re-circulate this letter on 25 October 1951.

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If, after the above mentioned letter is circulated, the situation does not improve, it may be advisable to circulate another memorandum explaining why the Air Force is interested in this problem and how reports are to be made.

The second major difficulty encountered has been transportation in the locality of the incidents. On many occasions, the interrogation of one source will lead to other sources. All of these "leads" must be followed to get a complete picture. This necessitates a great deal of travel within a city or even over part of a state. At times government transportation is available but at other times the incidents are not close to military establishments or if they are, all transportation may be in use. Since it is the policy not to reimburse travelers for such taxi fares, this has imposed a great financial burden on the investigator. In regard to the same subject, the time element again enters since there is usually only a limited amount of time that can be spent on an investigation and all the time spent attempting to get transportation or finding the correct bus routes is lost.

Steps have been taken to overcome this second major difficulty by requesting that Headquarters USAF send a wire to the military installation to which a visit will be made requesting that the Commanding Officer give full cooperation to Project Grudge personnel.

Another problem that has not been fully investigated is whether or not wide spread publicity to the project should be given in an attempt to obtain a more complete coverage of incidents. It is believed that more reports would be obtained but the publicity would also produce a mass of "crank" letters that would increase the workload a considerable amount. It has been tentatively decided that the best course of action is to wait and see what improvements are brought about by the revised AF letters being re-circulated by the Collection Division of D/I.

II. Reports of Specific Incidents

The inclosed list is a summary of all incidents that have been reported or were being investigated during the period 22 October 1951 to 30 November 1951. Several of the incidents are considered too detailed to summarize in the list so they are carried over and summarized in the appendices.

In the future, the list will consist of two parts: (1) incidents reported during the period covered by the report, and (2) incidents from the past period that are still in the process of being investigated or incidents that are pending during the previous month and are now closed.

Due to the huge task of investigating all reported incidents, it will be the policy of Project Grudge to concentrate on those incidents that appear to have originated from high grade sources, such as pilots, technically trained people, etc. The only exception to this will be where a number of sightings occur in a certain area at about the same time. All reports, however, will be incorporated in the file for statistical purposes.

In the evaluation of reported radar sightings, the Electronics Section of ATIC has been consulted. The majority of the radar sightings are very difficult to evaluate due to the possibility of phenomena caused by weather or in the electronic circuits of the set. About all that can be concluded on these sightings is the weather was or was not conducive to promoting phenomena known to be caused by certain weather conditions.

In certain instances special detailed reports will be written on the conclusions of the investigations of sightings. These will be in compliance with requests from higher headquarters for such reports. The conclusions of all other incidents will be concluded in the status report.

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT
25 Aug 51	2110	Lubbock, Texas	Group of lights that have been seen on many oc... (See Appendix I).
25 Aug 51	2158	Albuquerque, N.Mex.	Dark flying wing type aircraft with about 1 1/... the wing span of a B-36 (See Appendix II).
26 Aug 51	0118	Ellington AFB, Texas	Bright yellow light making a zig-zag course th... the sky.
26 Aug 51	0300	Ellington AFB, Texas	Erratic yellow light.
26 Aug 51	0628	Larson AFB, Wash.	Radar sighting - Aircraft were scrambled but f... to make contact. Visual search results negative. (See Appendix III)
26 Aug 51	1658	San Antonio, Tex.	Large object resembling a delta wing aircraft.
27 Aug 51	2000	Vandalia, Ill.	Bright orange light seen from the ground and a... from two aircraft (See Appendix IV).
29 Aug 51	1530	Grenier AFB, N.H.	Two silvery objects connected by a dark unid... body. First appeared to descent slowly, then rose and disappeared.
31 Aug 51	1245	Matador, Texas	Pear-shaped aluminum object seen to hover t... the area at high speed (See Appendix V).
3 Sept 51	2220	Spokane, Wash.	Bluish white light with fiery trail. About ... of an automobile headlight.
6 Sept 51	1120	Claremont, Calif.	Two groups of orange colored objects were se... objects were in the first group and one in the second.
3 Sept 51	1400	Spokane, Wash.	Three objects appeared out of the N.W. Appe... be a disk when viewed through a monocular.
8 Sept 51	1400	Spokane, Wash.	Bluish white light about the size of an auto... headlight leaving a fiery trail.
10 Sept 51	1110	Ft Monmouth, N. J.	Radar return - Fast moving, low flying target ... ved paralleling the coast on a northerly course (See Appendix VI).
10 Sept 51	1135	Ft Monmouth, N.J.	Pilots in T-33 aircraft attempted to intercep... nknown object with negative results (See Appendix VI)
10 Sept 51	1515	Ft Monmouth, N. J.	Radar return - High, moving target observed. ... Appendix VI)
10 Sept 51	2100	Goose AFB, Newfoundland	Radar return - GCA radar observed two objects ... the airfield.
11 Sept 51	1050	Ft Monmouth, N. J.	Radar return - Two radar sets picked up high ... (See Appendix VI).

INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
...s (See Appendix I).	4 Sec.	None	30° arc/sec	Unknown	180°	Varied	See Appendix I
...s the wing span of a B-36 (See Appendix II).	30 Sec.	None	300-400 mph	1000'	160°	Sandia Base guard and wife	See Appendix II
...the sky.	Unknown	None	High	High	360°	Three airmen	No investigation
	1 hour plus	None	Slow	High	Varied	Airman and WAF	Very probably a weather balloon
...to make contact. Visual search results	8 Min.	None	948 mph	13,000'	340°	AC & W Sqdrn	See Appendix III
	10 Sec.	None	Very high	Very high	315°	Retired Army Officer	No investigation
...from two aircraft (See Appendix IV).	Unknown	None	High	Unknown	Varied	Commercial Pilots and ground observers	See Appendix IV
...body. First appeared to descent slowly,	Unknown	None	Slow	10,000' at lowest point	None	Four airmen	No investigation - possibly balloon
...at high speed (See Appendix V).	Several seconds	None	Hovering to high speed	Low to High	90°	Two ladies	See Appendix V
...automobile headlight.	Seconds	None	High	Low	225°	AF Capt and wife	Pending
...objects were in the first group and one	3-4 Min	None	Unknown	High	280°	Two airmen	No investigation - possibly balloon
...as a disk when viewed through a monocular.	3-4 Min	None	Erratic	Unknown	225°	AF Major	Pending
...headlight leaving a fiery trail.	Seconds	None	High	Low	225°	AF 1st Lt	Pending
...ved paralleling the coast on a northerly	Several minutes	None	High	Low	360°	Radar operator	See Appendix VI
...known object with negative results	2 Min	None	High	8,000'	Varied 180° to 90°	Two AF Pilots	See Appendix VI Believed to be balloon
...Appendix VI)	Several minutes	None	Low	93,000'	Unknown	Radar operator	See Appendix VI Was balloon
...the airfield.	Several minutes	None	140 mph	4,000'	Varied	GCA operators	Pending
...(See Appendix VI).	Several minutes	None	Slow	31,000'	Unknown	Radar operators	See Appendix VI Was balloon

DATE	TIME (Local)	LOCATION	[redacted] DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	
11 Sept 51	1330	Ft Monmouth, N.J.	Radar Return (See Appendix VI).	Several Minutes	None	S
12 Sept 51	0130	Cincinnati, Ohio	Dark bullet shaped object about the same size as a B-29. Red glow in front, white vapor at tail.	10 Sec.	None	H
17 Sept 51	1217	Marion, Ohio	Pilot of Cessna reported that he almost collided with a black, high tailed swept wing aircraft.	Few Sec.	None	H
18 Sept 51	0435 to 0531	Great Lakes Region	Air Defense Command radar stations tracked fast moving objects across Michigan and Wisconsin.	Approx. 1 Hr.	None	H
23 Sept 51	1210	March AFB, Cal.	Object sighted over Long Beach. Four F-86's scrambled and sighted object over Nuroc. Intercept was unsuccessful due to altitude of object. Orbitted March AFB at 55,000'(See Appendix VII).	Unknown	None	U
30 Sept 51	1500	Orange, Va.	Circular object which was sometimes encircled by a brownish haze.	Unknown	None	L
1 Oct 51	0415	Webster, Texas	Brilliant white light at a low altitude. Was generally stationary.	2 Hrs.	None	S
2 Oct 51	1945 and 2100	White Sands, New Mexico	Various "Fireball Type" objects were observed.	Seconds	None	H
2 Oct 51	1800	Columbus, Ohio	Bright circular object.	15 Sec.	None	H
9 Oct 51	1302	Terre Haute, Ind.	Round, silver colored object passed over airport at high speed (See Appendix VIII).	15 Sec.	None	V
9 Oct 51	1345	Paris, Ill.	Round, silver colored object seen by private pilot (See Appendix IX).	Unknown	None	V
11 Oct 51	0630	Minneapolis, Minn.	Round silver object seen by pilots tracking a balloon and by ground observer team (See Appendix X).	Several Minutes	None	H
14 Oct 51	Unknown	Lowell, Mass.	"Glittering object"	Unknown	Unknown	U
16 Oct 51	1101	McChord AFB, Wash.	Medium gray, round object. First sighted by theodolite crew. Intercept by four F-84's was unsuccessful.	50 Min.	None	G
19 Oct 51	Unknown	Lenoir City, Tenn.	"Strange object"	Unknown	Yes	U
21 Oct 51	1250	Battle Creek, Michigan	Disk-shaped object 30' - 40' in diameter. Pilot in Navion met object head on. Object was disk-shaped with a highly polished surface.	Several Seconds	None	H
22 Oct 51	1120	N. Truro, Mass.	Radar return - unidentified object.	4 Min.	None	2
7 Nov 51	0715	San Antonio, Texas	Unknown, high flying object reflecting sun's rays. This incident took place at the same time a large meteor was seen in other parts of the S.W. The description is different, however, as none of the meteors looked like high flying aircraft.	2 Sec.	None	V

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DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
...ndix VI).	Several Minutes	None	Slow	6000'	Unknown	Radar Operator	See Appendix VI
...ject about the same size as a B-29. Red glow in front, white vapor at tail.	10 Sec.	None	High	20,000'	315°	One man, background unknown	No investigation
...ar that he almost collided with a black, high tailed swept wing aircraft.	Few Sec.	None	High	2800'	50°	Private Pilot	Probably friendly conventional a/c
...dar stations tracked fast moving objects across Michigan and Wisconsin.	Approx. 1 Hr.	None	High	Unknown	Varied	ADC Radar	Believed to be due to weather phenomena
...ing search. Four F-86's scrambled and sighted object over Muroc. Intercept ...altitude of object. (Omitted March AFB at 55,000'(See Appendix VII).	Unknown	None	Unknown	55,000'	Varied	F-86 pilots and ground observers	See Appendix VII
...ous sensations encircled by a brownish haze.	Unknown	None	Low	Unknown	Varied	Letter from four teen-age boys	No investigation
...ing altitude. Was partially stationary.	2 Hrs.	None	Stationary	Low	None	Airman	No investigation
...ts were noticed.	Seconds	None	High	High	Varied	Employees	No investigation
	15 Sec.	None	High	Unknown	270°	Graduate Physicist	No investigation Very possibly balloon
...high speed (See Appendix VIII).	15 Sec.	None	Very high	Unknown	135°	CAA Chief Aircraft Communicator	See Appendix VIII
...ted seen by private pilot (See Appendix IX).	Unknown	None	Very high	5000'	45°	Private pilot	See Appendix IX
...ion by pilots tracking a balloon and by ground observer team (See Appendix X).	Several Minutes	None	High	High	Unknown	Balloon observers	See Appendix X
	Unknown	Unknown	Unknown	Unknown	Unknown	Two children	No investigation
...black. First sighted by theodolite crew. Intercept by four F-94's was	50 Min.	None	Ovest	High	270°	AF and Navy personnel	Proved to be Venus
	Unknown	Yes	Unknown	Unknown	Unknown	Letter from civilian	No investigation
...50' - 60' in diameter. Pilot in Savior met object head on. Object was disk-...ly polished surface.	Several Seconds	None	High	3000'	85°	Civilian pilot, 14 yrs experience	Pending
...ntified object.	4 Min.	None	2370 mph	Unknown	135°	Radar operator	Indications of radar phenomena due to weather.
...object reflecting sun's rays. This incident took place at the same time a ...in other parts of the U.S. The description is different, however, as none ...like high flying aircraft.	2 Sec.	None	Very high	Very high	90°	City detective	No investigation

Appendix I

LUBBOCK, TEXAS - 25 August 1951

The first of a series of sightings related to this incident occurred the evening of 25 August 1951 at approximately 2110 CST. Four Texas Technical College professors were sitting in the backyard of one of the professor's homes observing meteorites in conjunction with a study of micrometeorites being carried out by the college. At 2110 they observed a group of lights pass overhead from N to S. The lights had about the same intensity as a bright star but were larger in area. The altitude was not determined but they traveled at a high rate of speed. The pattern of the lights was almost a perfect semicircle containing from 20 to 30 individual lights. Later in the evening a similar incident was observed and during a period of about three weeks a total of approximately twelve (12) such flights were observed by these men.

The group of men included:

a. The Head of the Petroleum Engineering Department
b. Professor of Geology, has Ph.D.
c. Professor of Physics, has Ph.D.
d. Professor of Chemical Engineering, has Ph.D.

Besides the above four men the following have observed the incidents:

a. Professor of Mathematics, has Ph.D.
b. Graduate student working on Ph.D.

In addition, a Professor of Astronomy was consulted on the incident, but he did not observe any of these flights.

The above mentioned men took a personal interest in the phenomena and undertook a study of the objects. Attempts were made to obtain an altitude measurement by laying out a measured base line perpendicular to the usual flight path of the object and placing angle measuring devices at the end of the base line, however, all their attempts failed because the objects did not appear on the nights the observers were waiting for them.

From the series of observations, the following facts were obtained:

a. The angular velocity of the object was very nearly 30° of arc per second.

b. There was no sound that could be attributed to the object.

c. The flight path of the object was from N to S in the majority of the flights.

d. There were two or three flights per evening.

e. The period between flights was about one hour and 10 minutes.

f. The color of the lights was blue-white.

g. There were from 20 to 30 separate lights in each formation.

h. The first two flights observed were a semi-circle of lights but in subsequent flights there was no orderly arrangement.

i. The object always appeared at an angle of about 50° from horizontal in the north and disappeared at about 60° in the south. The object did not gradually come into view as would an aircraft approaching from a distance, neither did it gradually disappear.

j. There was no apparent change in size as the object passed overhead.

Attempts were made to obtain the relative height of the object in respect to clouds. However, these attempts were also unsuccessful due to the fact that the objects passed between widely scattered clouds.

Efforts to determine whether or not there was any form between the lights by trying to see stars between the lights were made. This also was unsuccessful due to the short time the object was in view.

This phenomena was observed by at least one hundred people in and around Lubbock, Texas. Some of these people were of the opinion that the objects were birds.

On the evening of 31 August 1951, at about 2330 CST, a college freshman from Texas Tech observed three flights of the object and allegedly obtained five photographs. He obtained two photos of one flight and three of another. These photos show single rows of light in V-formation on two photos and a double row on the others. His description of the object is much the same as that of the college professors, except that the college professors never observed a perfect V-formation.

(See Appendix II and V for possibly related incidents.)

Status of the Investigation

Project Grudge personnel made a trip to Lubbock, Texas, on 6-9 November 1951 to obtain more details on the incident. Many sources who had seen the object or who were involved in the sighting were interrogated. A conference was held with the college professors and they offered to write a detailed account of their observations and forward it to ATIC. This report should be forthcoming.

The photographer who claims to have photographed the object was interrogated. Every effort was made to find a flaw in the photographer's account of the incident but the results were negative. The college professors did not believe the photographs were authentic as they had never observed a V-shaped group of lights. They were not sure, however, whether or not they had observed the same objects that were photographed. Since the interrogation, two

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discrepencies in the photos have been found and the photographer is being reinterrogated by the O.S.I.

One school of thought of the people in the Lubbock area is that the objects were some type of migratory birds reflecting light from the city. Several people reported that they definitely knew the objects were ducks because they could see wings flapping. It is very possible that some of the people who were looking for the object did see ducks as there were duck flights passing over during the period. It is significant that those people who saw ducks were definitely able to identify the objects as ducks, or some type of bird, because they could see the wings or heard them make a noise, however, other people were just as determined that they were not birds. The possible conclusion is that some people did see birds, but others saw some other objects.

The college professors do not believe the theory that the objects were birds, but they are giving the possibility more thought. If they were birds, they would have to be relatively low to give the illusion of high speed. An occasional flight of birds might pass low over a city on a clear night but it is highly doubtful if they would continue to do this for several nights. Migratory birds usually try to keep away from cities.

The Federal Wild Life Game Warden was visited and although he was not familiar with the incident he doubted if the objects were birds. He stated that they could have been, however. The most likely suspect, if it is a bird, is a member of the Plover family which has a pure white breast, but unless there was a sudden influx of the birds into the Lubbock area, the game warden doubted if there would be enough of these birds to make up as many flights as were observed.

If the photos are authentic, the objects very probably are not ducks because an experienced photographer from the Lubbock Avalanche Newspaper attempted to get photos of ducks using both natural light and flash, but failed.

The investigation of this incident is continuing. It is probably the most unique incident in the history of Project Grudge in that it was observed so many times by a scientifically trained group of observers. These people are continuing to attempt to arrive at a solution for the phenomena. They had previously lost interest after several weeks of observations because they believed that the object was some new Air Force aircraft or missile.

The photographs are now at the Photographic Reconnaissance Laboratory at Wright Air Development Center for analysis.

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Appendix II

ALBUQUERQUE, NEW MEXICO - 25 August 1951

On the evening of 25 August 1951, at 2158 MST, a Sandia Base Security Guard and his wife observed what they described to be a flying wing type aircraft similar to the Northrop Fly Wing Bomber (B-49) pass over the back-yard of their trailer home in the east part of Albuquerque. They judged the wing span of the aircraft to be about one and one half times the wing span of a B-36, with which they were familiar. The object was flying low, the altitude was thought to be about 800 ft. - 1000 ft., and there was no sound that could be attributed to the object. The color of the object was not apparent due to the twilight but dark chordwise stripes were noticed under the wings. Six to eight pairs of soft glowing lights were noticed on the trailing edge of the wing. The speed was judged to be about 300 - 400 mph and the object was on a heading of approximately 160°.

(See Appendix I for possible related incident.)

Weather

Broken clouds at 17,000 ft., visibility five miles, wind S at 5 mph.

Status of Investigation

The possibility of this being a known aircraft was checked with negative results. The AC and W Radar Station at Kirtland AFB did not observe any unusual or unidentified aircraft.

The guard's background was checked and since he has a "Q" clearance, it has been assumed that he is mentally stable.

The photos taken of the V-shaped object at Lubbock, Texas, (see Appendix I) were sent to Albuquerque. They were shown to the sources by the O.S.I. and sources stated that arrangement of lights on the object they saw was similar to the photo. They sketched in the wing as they saw it.

An investigation was made to determine whether or not any one else had seen the object but only negative results were obtained.

Further evaluation of this incident depends on the outcome of attempts to establish the authenticity of the Lubbock photos.

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LARSON AFB, WASHINGTON - 26 August 1951

On 26 August 1951 at 0836 PST, an unidentified flying object was detected by an AN/CPS-4 and AN/CPS-1 radar sets. The object was tracked continuously for a period of six minutes and made a timed ground speed of 950 mph. The object was on a course of 340° with only slight deviations enroute. An altitude reading of 13,000 feet was obtained but the accuracy of the measurement is questionable due to brief length of time the object was detected.

The F-86 aircraft were scrambled but radar contact with the object was lost before the aircraft were airborne. A visual search was conducted from 17,000 to 25,000 feet with negative results.

The operator of the radar set, an Air Force Captain, is considered to be an expert operator.

Weather

Weather conditions at the time of sighting were not favorable for anomalous microwave propogation.

Status of Investigation

Review of this incident by the Electronics Section of ATIC concludes that the return was possibly due to interference. This was concluded because of the apparent path of the object, directly approaching the station, and the fact that the target was observed on only the low beam of the AN/CPS-1 radar set.

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Appendix IV

VANDALIA, ILLINOIS - 27 August 1951

The only information available on this incident is a newspaper article from "Vandalia Leader" of 30 August 1951.

"It wasn't a flying saucer! Nor was it a conventional type airplane! But whatever it was, it has aroused the curiosity of at least five persons who saw it soaring through the air Monday night.

"'It was a big orange light with blinding intensity when I first noticed it over the southwest corner of the airport,' Ray Williams told the Leader. 'I had just taxied out onto the runway preparing to take a flight around the city when I noticed the light. It was between 8 and 8:30 p.m. I called over the radio to the CAA official on duty Albert Draoklec, and to Paul Reese and asked them to take a look.'

"'The lighted object disappeared into the west and we decided maybe there was nothing to it. So I decided to continue with my flight plans,' Williams stated.'

"'Shortly after I had taken off I noticed the light again, approaching my plane. It came directly at me and then circled my plane twice before heading toward Greenville. I followed it and it made a circle round that town and came back toward Vandalia. I last saw it near the country club. The CAA radioed a transport pilot who was passing over Vandalia at the time at about 20,000 feet and he too saw the object.'

"'It was all very spooky,' the Vandalia airman said. 'It wasn't an airplane but whatever it was the light was on the tail of it, and there was a small red light on top. Probably it was some military craft from Scott Field making a test run.'

"The lighted object which appeared to have a 10 to 12 inch lens, was also seen by Dwight Kerns in St. Elmo the same evening."

Status of Investigation

An attempt will be made to obtain further information on this incident.

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Appendix V

MATADOR, TEXAS - 31 August 1951

On 31 August 1951 at approximately 1245 CST two ladies were driving in an automobile several miles north of Matador, Texas. The object was described as a pear-shaped object, aluminum or silver in color, which readily reflected the sunlight. The object had a port or some type of aperture in the side. It moved through the air with the small end forward. They judged the size to be about that of a B-29 fuselage. There was no sign of any exhaust and no noise was heard.

As the two ladies were driving north from Matador, Texas, the driver of the automobile first noticed the object about 150 yards ahead of the automobile. They stopped and both ladies got out to observe the object. It was drifting slowly in an eastward direction at a speed they judged to be "less than the speed required to take off in a cub aircraft" and an altitude of about 120 ft. Seconds later the object began to ascent rapidly and in a few seconds it moved out of sight to the east in a circular ascent. (The wind at this time was from the NE at about 5-7 knots.)

A background investigation showed that both women were of excellent character.

This incident is of interest because it was observed during the same period as the objects over Lubbock, Texas, (see Appendix I).

Weather

a. 1230 CST - Reese AFB - 31 August 1951
Estimated ceiling 6,000 ft., broken clouds, with thin scattered clouds at 25,000 ft. Visibility 15 miles. Wind ENE at 3 knots.

b. 1230 CST - Childress, Texas - 31 August 1951
Estimated ceiling 25,000 ft., overcast. Visibility 15 miles. Wind NNE at 7 knots. Towering cumulus clouds in SE quadrant.

Status of Investigation

It has been reported that a road repair crew saw the same object later on the same day. Attempts will be made to contact members of this road crew and obtain their statements. There were also reports of crop dusting activity in the area, so attempts will be made to determine whether or not the ladies could have seen this activity.

[redacted]

FORT MONMOUTH, NEW JERSEY - 10-11 September 1951

On 10 and 11 September 1951, a series of incidents occurred in the area of Fort Monmouth, N. J. An initial sighting of an unidentified object was made on a radar set. Soon after the radar sighting, two Air Force officers in a T-33 aircraft unsuccessfully attempted to intercept an unidentified object. Later several more radar sightings were reported.

Status of Investigation

A complete investigation of this incident was carried out and will be reported in Project Grudge Special Report No. 1. It has been tentatively determined that the T-33 pilots probably observed a balloon that had been launched a few minutes prior to their arrival in the area. Two of the radar sightings were returns from balloons and the others were probably due to weather phenomena and excitement of the student operators due to previous sightings. Only one radar return cannot be explained. The operator who observed this incident assumed the object was traveling over 700 mph because the radar set's automatic tracking would not follow the target. It is possible that the inability to track the object was due to his inability to properly operate the set under mental stress.

[redacted]

Appendix VII

MARCH AFB - 23 September 1951

On 23 September 1951 at 0810 PST, an unidentified object was sighted over Long Beach, California. Four F-86 aircraft were scrambled and the object was sighted by them over Muroc, California. On attaining an altitude of 43,000 ft. the F-86's reported the object to be orbitting March AFB at an estimated altitude of between 50,000 ft. and 55,000 ft. The object appeared to be a swept wing, fighter type aircraft.

Weather

Unavailable at this time.

Status of Investigation

Radiosonde balloons were released from San Diego, Long Beach and Santa Maria, California at approximately 0700 PST. All of these weather stations were checked by OSI personnel and although the balloons were released all weather station personnel stated that it would be very doubtful if their balloons would have traveled the course that the object traveled.

All of the major aircraft factories and installations conducting experimental flight tests were contacted. No experimental aircraft airborne at the time of the sighting.

Additional information has been requested as to additional details of the incident such as times and locations during the attempted interception by the F-86's and other possible balloon launchings.

Appendix VIII

TERRE HAUTE, INDIANA - 9 October 1951

On 9 October 1951 at 1342 CST, a CAA Chief Aircraft Communicator observed a silver object pass directly overhead while he was at Hulman Municipal Airport, five miles east of Terre Haute, Indiana. The object was judged to be approximately the same size as a 50 cent piece held at arm's length. The object passed overhead at a very high rate of speed going in a southeasterly direction, passing from directly overhead to the horizon in about 15 seconds. There was no sound or vapor trails. The shape and general form of the object could be seen as the object passed over the horizon and out of sight.

(For related incident, see Appendix IX.)

Weather

Clear, bright sun, no clouds or haze.

Status of Investigation

Further details on the incident will be obtained but it is doubtful if any further information will indicate the possible identity of the object.

Appendix IX

PARIS, ILLINOIS - 9 October 1951

On 9 October 1951, at approximately 1345 CST, a private pilot en route from Greencastle, Indiana, to Paris, Illinois, sighted a silver object just east of Paris, Illinois, at 5,000 ft. altitude. The object appeared to be stationary in as much as it did not increase or diminish in size with the approach of the aircraft. The object then started to travel in a northeasterly direction south of the Newport, Indiana, Atomic Energy Plant.

(See Appendix VIII for related incident.)

Weather

Clear, bright sun, no clouds or haze.

Status of Investigation

More details of the incident will be obtained. Weather balloons are launched from Chanute AFB which is approximately 45 miles NW of the location of the incident. It is very doubtful if this object was a balloon as the balloon would have risen to a much higher altitude if it had drifted SE from Chanute AFB.

Appendix X

MINNEAPOLIS, MINN. - 11 October 1951

The only information available on this incident is a letter quoted below.

"TIME: 0630, 11 Oct 51. Dick Reilly and I were flying at 10,000 ft. observing the grab bag balloon when I saw a brightly glowing object to the S.E. of U. of M. Airport. At that time we were a few miles north of Minneapolis and heading east. I pointed it out to Dick and we both made the following observation:

"The object was moving from east to west at a high rate and very high. We tried keeping the ship on a constant course and using reinforcing member of the windshield as a point. The object moved past this member at about 50 degrees per second.

"This object was peculiar in that it had what can be described as a halo around it with a dark undersurface. It crossed rapidly and then slowed down and started to climb in lazy circles slowly. The pattern it made was like a falling oak leaf inverted. It went through these gyrations for a couple minutes and then with a very rapid acceleration disappeared to the east. This object, Dick and I watched for approximately five minutes.

"I don't know how to describe its size, because at the time I didn't have the balloon in sight for a comparison.

"Shortly after this we saw another one, but this one didn't hang around. It approached from the west and disappeared to the east, neither one leaving any trace of vapor trail.

"When I saw the second one I called our tracing station at the U. of M. Airport and the observers there on the theodolite managed to get glimpses of a number of them, but couldn't keep the theodolite going fast enough to keep them in the field of their instruments. Both Doug Smith and Dick Dorian caught glimpses of these objects in the theodolite after I notified them of their presence by radio."

Status of Investigation

Further details of the incident have been requested. The sources have been investigated and are known to be experienced high altitude balloon observers with General Mills balloon projects.

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SPECIAL REPORT NO. 1

PROJECT GRUDGE

28 December 1951

AIR TECHNICAL INTELLIGENCE CENTER
WRIGHT-PATTERSON AIR FORCE BASE
DAYTON, OHIO

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This is a special report on the investigation of the sighting of an unidentified aerial object. Special reports such as this will be made on outstanding incidents and in incidents where such a report is requested by higher authority.

FORT MONMOUTH, NEW JERSEY, INCIDENTS

On 10 and 11 September 1951, a series of both visual and radar sightings were reported from the Fort Monmouth, New Jersey, area.

I. VISUAL SIGHTING BY PILOT AND PASSENGER OF T-33 AIRCRAFT

A. Discussion

At approximately 1135 EDST an unidentified object was sighted by the pilot of a T-33 aircraft, an Air Force Lieutenant, enroute to Mitchell Air Force Base, New York, from Dover Air Force Base, Delaware. The object appeared to be over Sandy Hook, New Jersey, between 5000 ft. and 8000 ft. at 11 o'clock from the aircraft heading. The T-33 was approximately over Point Pleasant, New Jersey, at the time of the initial sighting. Upon seeing the object, the pilot started descending at 360° turn to the left in an attempt to intercept and identify the object. Approximately 45 seconds after the pilot first sighted the object, the passenger, an Air Force Major, who had been making a radio check, sighted the object. The object was then near Freehold, New Jersey, making a 120° turn toward the coast. The pilot continued his 360° turn but the object was lost as it crossed the coast. During the descending turn the speed of the T-33 increased from 450 to 550 mph and the altitude decreased from 20,000 ft. to 17,000 ft. (See inclosed overlay.)

When first sighted, the object appeared to be descending over Sandy Hook, New Jersey. It then leveled out and maintained a constant altitude. The object was round and silver in color but did not reflect the sunlight. At one time during the attempted intercept, it appeared flat. The size was judged to be 30 ft. to 50 ft. in diameter.

At approximately 1112 EDST, 10 September 1951, two balloons were released from the Evans Signal Laboratory, New Jersey, located at 40° 10' N and 74° 04' E. (See inclosed overlay.) These balloons are 7 ft. - 8 ft. in diameter at time of release and expand on ascending. They ascend at an average of 800 fpm and are painted silver for radar tracking. Experienced balloon observers state that when viewed from certain angles they appear to be disc-shaped. At 1135 EDST these balloons would have been at approximately 18,000 ft., and would have moved to a position nearly in line with Point Pleasant, New Jersey, and Sandy Hook. (Wind SSW at 10-15 knots.)

Attempts were made to use the information obtained from the interrogation of the T-33 crew and the data on the balloon launching to prove that the pilot and passenger of the T-33 had observed a balloon. However, not all of the data given was consistent with such a conclusion.

In an attempt to establish the fact that the object was a balloon, a flight path similar to the one given by the T-33 crew was assumed. (See "Assumed Path of T-33" in inclosure.) The T-33 crew was interrogated twice and gave different flight paths and tracts of the object at each one. It is therefore assumed that due to the altitude and speed of the T-33, and the fact

[redacted]

that crew was intent on watching the object, they could not pin point their ground track any closer than 5 nautical miles and thus it would be feasible to assume a flight path within 5 nautical miles of the given track. Since the two interrogations as to location of the ground tracks differed to some extent, the track marked on a chart included with signed statement is assumed to be most nearly correct.

Referring to the assumed flight path on the inclosed overlay, at A, the object appeared to be over Sandy Hook. It will be noted that a comparatively small object closer to the a/c would appear to be large if assumed to be over Sandy Hook. (See Figure 1.)

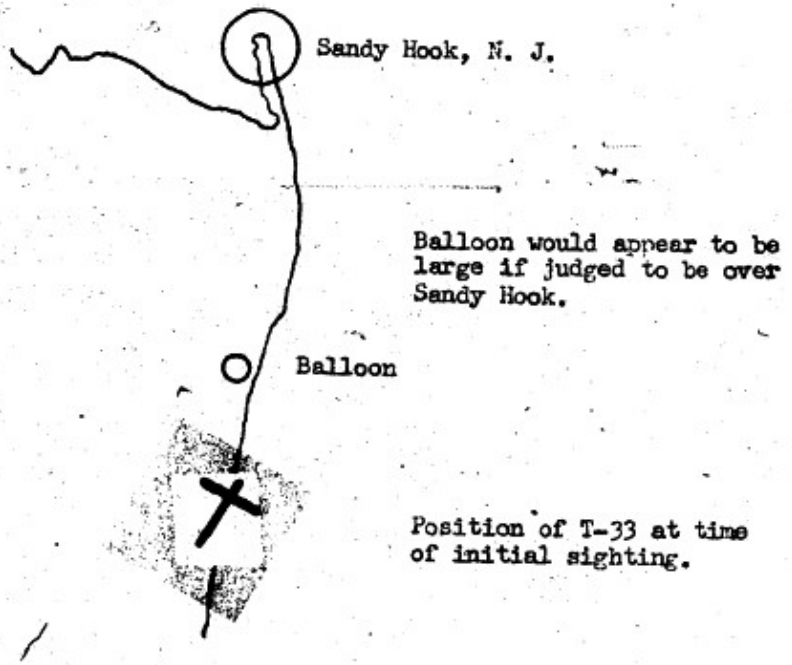


Figure 1. Plan View of Initial Sighting
(not to scale)

As the T-33 approached the balloon, the balloon appeared to be traveling at a high rate of speed. Several seconds must have passed after the initial sighting while the pilot decided that the object was not a conventional a/c and that he should attempt to identify it. During this period, it is assumed that the a/c continued on course making the object appear to be flying straight and level on a reciprocal heading. The fact that the object appeared to be descending when first sighted cannot be explained. The fact that only one of the two balloons was seen can be explained by the fact that the observers concentrated on one balloon and did not notice the other one.

[redacted]

Forty-five seconds after the initial sighting, the passenger noted the object to be turning left near Freehold, New Jersey. This can be explained by the fact that the T-33 was turning and the relative motion caused the balloon to appear to be turning. As the T-33 continued inland, the line of sight changed until the balloon was silhouetted against the sea or sky and being silver blended into the background and was lost. This "disappearance" of balloons is a common occurence with pilots tracking research balloons.

It is apparent from the above that several assumptions had to be made in order to show that the object was one of the balloons released at Evans Signal Laboratory, but the fact there was a balloon in the near vicinity and the fact that the pilot and observer were not sure of their exact track adds a great deal of credence to the assumptions. However, since assumptions were made, it cannot be concluded that the object was definitely a balloon.

II. RADAR SIGHTINGS FROM FORT MONMOUTH, NEW JERSEY

A. Discussion

All of the radar sightings during this period were made by students at the Fort Monmouth training center. In addition to this, the students involved were taking a maintenance course. The instructor would put certain mechanical or electronic difficulty in the set and let the student find and remedy trouble. If the student became proficient in this phase, he was allowed to operate the set much the same as in tactical operations. No plotting records, logs or data of any type were kept. It should be stressed that these students were maintenance students, not operators.

1. On 10 September 1951 an AN/MPG-1 radar set picked up a fast-moving, low-flying target (exact altitude undetermined) at approximately 1110 hours southeast of Fort Monmouth at a range of about 12,000 yards. The target appeared to approximately follow the coast line changing its range only slightly but changing its azimuth rapidly. The radar set was switched to full-aided azimuth tracking which normally is fast enough to track jet aircraft, but in this case was too slow to be resorted to. The target was lost in the northeast at a range of about 14,000 yards.

Upon interrogation, it was found that the operator, who had more experience than the average student, was giving a demonstration for a group of visiting officers. He assumed that he was picking up a high-speed aircraft because of his inability to use full-aided azimuth tracking which will normally track an aircraft at speeds up to 700 mph. Since he could not track the target he assumed its speed to be about 700 mph. However, he also made the statement that he tracked the object off and on from 1115 to 1118, or three minutes. Using this time and the ground track, the speed is only about 400 mph.

No definite conclusions can be given due to the lack of accurate data but it is highly probable that due to the fact that the operator was giving a demonstration to a group of officers, and that he thought he picked up a very unusual radar return, he was in an excited state, accounting for his inability to use full-aided automatic tracking. He admitted he was "highly flustrated" in not being able to keep up with the target using the aided tracking. The weather on 10 September was not favorable for anomalous propagation.

2. On 10 September 1951, 1515 hours, an SCR 584, serial number 433, tracked a target which moved about slowly in azimuth north of Fort Monmouth at a range of about 32,000 yards at the extremely unusual elevation angle of 1350 mils, (altitude approximately 93,000 ft.). This was proven to be a weather balloon. It was tracked at the request of the Commanding Officer of the Student Attachment to determine the altitude in order to establish who won a pool concerning what the altitude of a balloon which was sighted might be.

3. On 11 September 1951, 1050 hours, two SCR 584's, serial number 217 and 315, picked up the same target northeast of Fort Monmouth at an elevation angle of 350 to 300 mils at a range of approximately 30,000 yards (approximate altitude 31,000 feet). The sets track automatically in azimuth and elevation and with aided range tracking are capable of tracking targets up to a speed of 700 mph. In this case, however, both sets found it impossible to track the target in range due to its speed and the operators had to resort to manual range tracking in order to hold the target. The target was tracked in this manner to the maximum tracking range of 32,000 yards. The operators judged the target to be moving at a speed several hundred miles per hour higher than the maximum aided tracking ability of the radar sets. This target provided an extremely strong return echo at times even though it was at maximum range, however, the echo signal occasionally fell off to a level below normal return. These changes coincided with maneuvers of the target.

This sighting proved to be a weather balloon. How it was determined is unknown but ATIC was informed that it was a balloon by AFOIN-TC telecon TT-252, dated 5 October 1951, CSAF Item #12, which stated: "Radar sighting was later identified as weather balloon. Target track was vertical. Later exploded and descended to ground."

4. On 11 September 1951, at about 1330, a target was picked up on an SCR-584 radar set, serial number 315, that displayed unusual maneuverability. The target was approximately over Navesink, New Jersey, as indicated by its 10,000 yard range, 6,000 feet altitude and due north azimuth. The target remained practically stationary on the scope and appeared to be hovering. The operators looked out of the van in an attempt to see the target since it was at such a short range, however, overcast conditions prevented such observation. Returning to their operating positions the target was observed to be changing its elevation at an extremely rapid rate, the change in range was so small the operators believed the target must have risen nearly vertically. The target ceased its rise in elevation at an elevation angle of approximately 1,500 mils at which time it proceeded to move at an extremely rapid rate in range in a southerly direction once again the speed of the target exceeding the aided tracking ability of the SCR-584 so that manual tracking became necessary. The radar tracked the target to the maximum range of 32,000 yards at which time the target was at an elevation angle of 300 mils. The operators did not attempt to judge the speed in excess of the aided tracking rate of 700 mph.

It is highly probable that this is an example of anomalous propagation as the weather on 11 September was favorable for this type of phenomenon. The students stated that they were aware of this phenomenon, however, it is highly probable that due to the previous sightings of what they thought were unusual types of aircraft, they were in the correct psychological condition to see more such objects.

[redacted]

III. CONCLUSIONS

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A. The unidentified aircraft reported by the T-33 pilots was probably a balloon launched by the Evans Signal Laboratory a few minutes before the T-33 arrived in the area.

B. The 1110 EDST radar sighting on 10 September 1951 was not necessarily a very high-speed aircraft. Its speed was judged only by the operator's inability to use aided tracking and this was possibly due to the operator being excited, and not the high speed of the aircraft.

C. The 1515 EDST radar sighting on 10 September 1951 was a weather balloon.

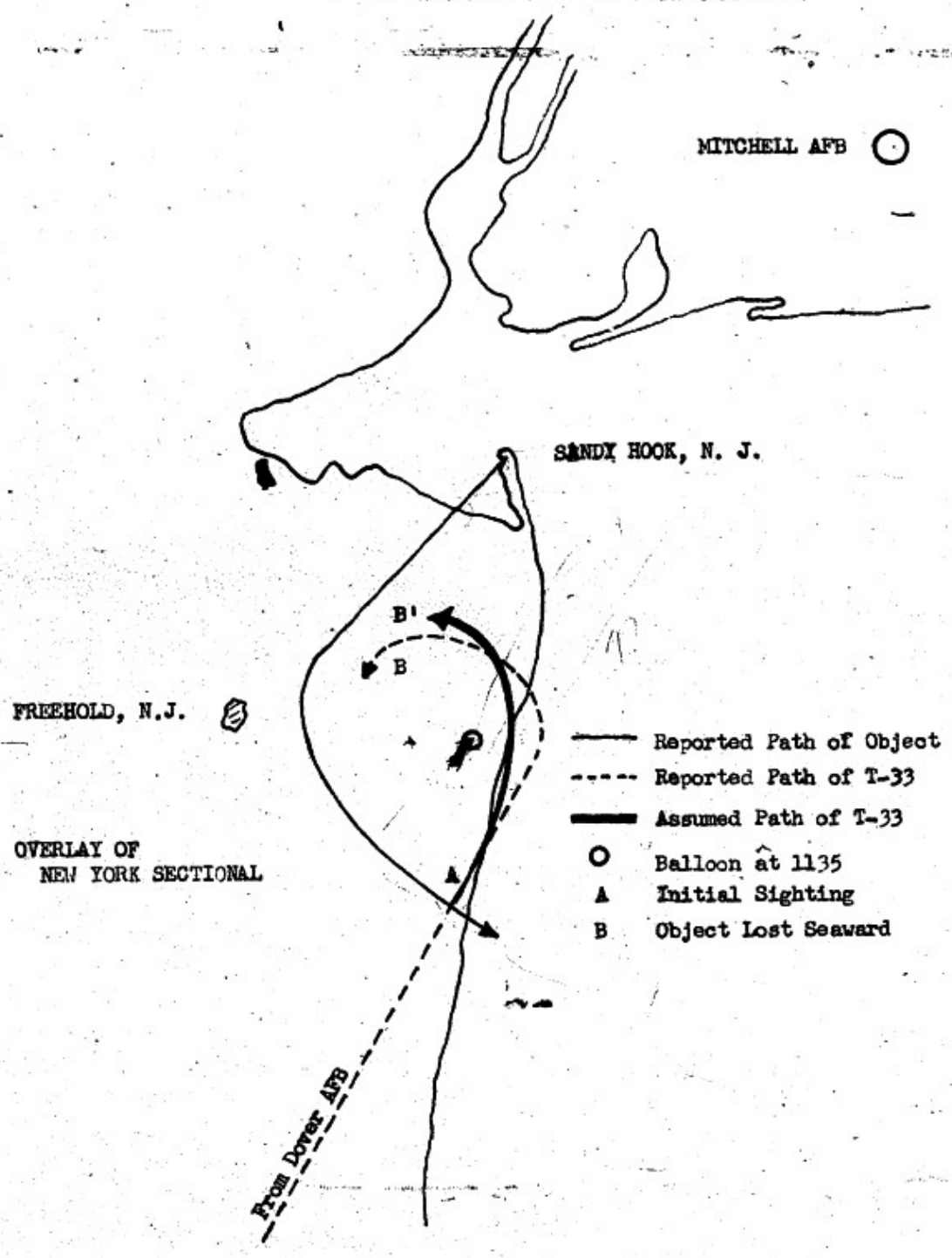
D. The 1050 EDST radar sighting on 11 September 1951 was a weather balloon.

E. The 1330 EDST rader sighting on 11 September 1951 remains unknown but it was very possible that it was due to anomalous propagation and/or the student radar operators' thoughts that there was a great deal of activity of unusual objects in the area.

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PROJECT GRUDGE

31 DECEMBER 1951

PROJECT NO. 10073



AIR TECHNICAL INTELLIGENCE CENTER
WRIGHT PATTERSON AIR FORCE BASE
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By Robert J. Friend, Mjr
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Date 9 SEPT 1960

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PROJECT GRUDGE

31 DECEMBER 1951

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This report is the second of a series of monthly status reports of Project Grudge. Each report will be written on or near the last day of the month and will contain a list of all incidents reported during the month covered by the report. The reports that are considered to be outstanding will be summarized in the appendices of the report so that more details can be presented. The overall status of the project will also be presented.

Additional information may be obtained on any incident by directing requests to Chief, Air Technical Intelligence Center, Attention: ATIAA-2c, Wright-Patterson Air Force Base, Dayton, Ohio.

STATUS OF PROJECT GRUDGE

I. OVERALL STATUS

A. Files

The majority of the time devoted to Project Grudge during the period covered in this Status Report, 30 November 1951 to 31 December 1951, has been spent in sorting and filing old Project Grudge and Project Sign files. All of the incidents dating back to 1946 that are in ATIC have been sorted and filed. There are approximately 800 on file. Each incident has been put in a separate folder and filed in chronological order.

Summary cards are being made on each incident. These summary cards will include data such as description of the object, course, altitude, speed, maneuvers, etc. These cards will then be cross-indexed in an attempt to obtain characteristics or trends in the sightings. It is contemplated that this cross-indexing will be completed by the middle of February.

B. Missing Reports and Photographs

It is apparent that the details of some of the reports between early 1949 and mid-1951 are missing. An attempt will be made to obtain these reports from other agencies so that the ATIC file will be complete. Photographs referred to in some reports are also missing. Although there have not been very many photographs of alleged unusual aerial objects submitted to ATIC, there have been a few and an attempt will be made to obtain prints of these photographs.

C. Map for Plotting Sightings

A large map of the United States is being prepared and is nearly completed. All of the sightings will be plotted on this map in an attempt to establish some pattern in the sightings. A color code will be worked out so that as much information as possible can be graphically illustrated on the map.

D. Delays in Obtaining Information

It will be noted in the list of incidents that is contained in this report that the investigations of sightings reported several months ago are still pending or that some sightings have not been investigated due to the time that has elapsed since the sighting. The investigations being conducted in conjunction with the project are still being hampered by the delays in receiving information.

On 25 October 1951, it was requested that AFOIN-CC-1 letter dated 8 September 1950 subject: "Reporting of Information on Unconventional Aircraft" be revised and recirculated to all AF commands. It is hoped that as soon as this is done the situation will improve.

In addition to delays in receiving additional information, it is believed that many sightings of unidentified objects are not being reported at all. This belief is founded on the fact that ATIC has received newspaper clippings or requests for information on sightings about which there is no information in the records.

E. Consultants

Several conferences have been held with members of a prominent research organization to determine whether or not there is enough information available on the unidentified aerial objects to warrant a thorough scientific investigation. These people have inspected the files, discussed the problem, and it is their opinion that there are enough reports that cannot be explained by known objects or phenomena to warrant a detailed investigation.

Several other prominent engineers and scientists have been contacted and their opinions are much the same as those stated above.

Negotiations are underway to obtain the services of consultants in the fields of physics, nuclear physics, astronomy, psychology, etc., to assist in the analysis of the reports. These consultants will also attempt to make a continuing statistical analysis of the reports in an attempt to determine whether or not there is any significant pattern or characteristics in the sightings. In this respect, it is hoped that the project can receive the full cooperation of all AF commands in promptly reporting all sightings of unidentified aerial objects, so that as many authentic reports as possible will be available for study by statistical analysis.

II. REPORTS OF SPECIFIC INCIDENTS

A. Inclosed Summary List of Incidents

The inclosed list is (1) a summary of all incidents reported during the period of 30 November 1951 to 31 December 1951; (2) those incidents that were reported in Status Report No. 1, dated 30 November 1951, and still have the conclusions pending; and (3) those incidents that have been closed during the month covered by the report.

Incidents which are considered too detailed to summarize in the list of sightings are again given in the appendices, and in greater detail.

SIGHTINGS OF UNIDENTIFIED OBJECTS

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SP
25 Aug 51	2110	Lubbock, Texas	Group of lights that have been seen on many occasions. (See Appendix I)	4 Sec.	None	30°
25 Aug 51	2158	Albuquerque, N.M.	Dark flying wing type a/c with about 1 1/2 times the wing span of a B-36. (See Appendix II)	30 Sec.	None	300- m
27 Aug 51	2000	Vandalia, Ill.	Bright orange light seen from the ground and again from two aircraft.	Unknown	None	High
31 Aug 51	1245	Matador, Texas	Pear-shaped aluminum object seemed to hover then leave the area at high speed. (See Appendix III)	Several seconds	None	Hove to h spe
3 Sept 51	2220	Spokane, Wash.	Bluish-white light with fiery trail. About the size of an automobile headlight.	Seconds	None	High
3 Sept 51	1400	Spokane, Wash.	Three objects appeared out of NW. Appeared to be a disk when viewed through a monocular.	3-4 Min.	None	Erra
8 Sept 51	1400	Spokane, Wash.	Bluish-white light about the size of an automobile headlight leaving a fiery trail.	Seconds	None	High
10 Sept 51	2100	Goose AFB, Newfoundland	Radar return - GCA radar observed two objects near the airfield.	Several Minutes	None	140
23 Sept 51	1210	March AFB, Calif.	Object sighted over Long Beach. Four F-86's scrambled and sighted object over Muroc. Intercept was unsuccessful due to altitude of object. Orbitted March AFB at 55,000 ft. (See Appendix IV)	Unknown	None	Unkn
9 Oct 51	1342	Terre Haute, Ind.	Round, silver colored object passed over airport at high speed. (See Appendix V)	15 Sec.	None	Very
9 Oct 51	1345	Paris, Ill.	Round, silver colored object seen by private pilot. (See Appendix VI)	Unknown	None	Very
10 Oct 51	1010	Minneapolis, Minn.	Round, silver object seen by pilots tracking a balloon. (See Appendix VII)	Two Min.	None	High
11 Oct 51	0630	Minneapolis, Minn.	Round, silver object seen by pilots tracking balloon and by ground observer team. (See Appendix VII)	Several Minutes	None	High
11 Oct 51	0845	Neubiburg AFB, Germany	Object seen by two airmen who described object as "some form of flying disk".	Unknown	None	Unkn
21 Oct 51	1250	Battle Creek, Mich.	Disk-shaped object 30 ft. - 40 ft. in diameter. Pilot in navion met object head-on. Object was disk-shaped, with a highly polished surface.	Several Seconds	None	High
21 Oct 51	0500Z	62°N 15°W	Bright yellowish flash on the horizon.	Unknown	None	Unkn
26 Oct 51	2000-2030	Buena Vista, Col.	Greenish-blue brilliant light with an incandescent glow in the form of a tail.	15-20 Sec.	None	Unkn
30 Oct 51	1930	Four Corners, Col.	Object appeared white first, then red. Core glowed with brilliant green color like neon tube.	Unknown	None	Unkn

ATIC FORM NO. 328

TINGS OF UNIDENTIFIED OBJECTS

INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
casions. (See Appendix I)	4 Sec.	None	30° Arc/s	Unknown	180°	Varied	See Appendix I
s the wing span of a B-36.	30 Sec.	None	300-400 mph	1000 ft.	160°	Sandia Base guard and wife	See Appendix II
ain from two aircraft.	Unknown	None	High	Unknown	Varied	Commercial pilots and Ground Obs.	No further investigation. No conclusions.
n leave the area at high speed.	Several seconds	None	Hovering to high speed	Low to high	90°	Two ladies	See Appendix III
size of an automobile headlight.	Seconds	None	High	Low	225°	AF Captain and wife	Believed to be meteor or fireball. No conclusions.
be a disk when viewed through a	3-4 Min.	None	Erratic	Unknown	225°	AF Major	No conclusions.
s headlight leaving a fiery tail.	Seconds	None	High	Low	225°	AF 1st Lt	Believed to be a meteor or fireball. No conclusions.
r the airfield.	Several Minutes	None	140 mph	4,000 ft.	Varied	GCA Operator	No further investigation. Insufficient information.
rabled and sighted object over Muroc. bject. Orbitted March AFB at 55,000 ft.	Unknown	None	Unknown	55,000 ft.	Varied	F-86 pilots and Ground Obs.	See Appendix IV.
at high speed. (See Appendix V)	15 Sec.	None	Very high	Unknown	135°	CAA Chief A/C Communicator	See Appendix V.
ot. (See Appendix VI)	Unknown	None	Very high	5,000 ft.	45°	Private pilot	See Appendix VI.
alloon.(See Appendix VII)	Two Min.	None	High	High	SE	Balloon Obs.	See Appendix VII.
loon and by ground observer team.	Several Minutes	None	High	High	Unknown	Balloon Obs.	See Appendix VII.
s "some form of flying disk".	Unknown	None	Unknown	20,000 ft.	Unknown	Two airmen	No conclusions.
Pilot in navion met object head-on, rface.	Several Seconds	None	High	3,000 ft.	85°	Civilian pilot 14 yrs experience	No conclusions.
	Unknown	None	Unknown	Unknown	Unknown	Scientist	No conclusions.
t glow in the form of a tail.	15-20 Sec.	None	Unknown	Unknown	N to SW	AF Major	Example of green fireball phenomena. No conclusions.
ed with brilliant green color like	Unknown	None	Unknown	Unknown	N to SW	Civilian	Example of green fireball phenomena. No conclusions.

SIGHTINGS OF UNIDENTIFIED OBJECTS

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HE
11 Nov 51	1030	42° 43'N 78° 32'W	Object not seen. Only vapor trail.	Unknown	None	Unknown	High	
24 Nov 51	1825	Lower Michigan	Sighted by number of observers. Color variously described as bright white, white, grayish white. (See Appendix VIII)	Unknown	None	High	High	
24 Nov 51	1953	Minneapolis, Minn.	Flying wing shaped object.	Unknown	None	Hovering	25,000 ft.	
7 Dec 51	1412	Kansas City, Mo.	Described as perfectly round, with inner core resembling fuselage of small a/c with tapered and stubby wings.	Approx. 1 Min.	None	Unknown	Unknown	
7 Dec 51	1650	Sunbury, Ohio	Shiny, silvery sphere seen through telescope.	Half an hour	None	High	High	
10 Dec 51	1820 EST	Buffalo, N. Y.	Large, white, extremely brilliant and globular in shape.	15 Sec.	None	240 Knots	3000-4000 ft.	
12 Dec 51	21502	Hastings, Minn.	White object resembling a kite about 1000 ft. below a/c.	3-4 Min.	None	360-400 mph	9,000 ft.	
26 Dec 51	1910	Alexandria, Va.	Pilot saw object glowing which circled and hovered.	2 Min.	None	Unknown	1000-6000 ft.	

AMC FORM NO. 526

SIGHTINGS OF UNIDENTIFIED OBJECTS

UNCLASSIFIED

SCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
vail.	Unknown	None	Unknown	High	Unknown	Civilian	No conclusions.
Color variously described as bright white, white, (VIII)	Unknown	None	High	High	Unknown	Airlines pilot and others	See Appendix VIII.
	Unknown	None	Hovering	25,000 ft.	90°	AF Pilot	Pending.
with inner core resembling fuselage of small a/c with	Approx. 1 Min.	None	Unknown	Unknown	NW	Civilian	Pending.
high telescope.	Half an hour	None	High	High	N to W	Civilian	No investigation. No conclusions.
and globular in shape.	15 Sec.	None	240 Knots	3000-4000 ft.	S to N	USAF Pilot	Pending.
1000 ft. below a/c.	3-4 Min.	None	350-400 mph	9,000 ft.	Unknown	USAF Pilot	Pending.
[illegible]	2 Min.	None	Unknown	1000-5000 ft.	Unknown	USAF Pilot	Proved to be experimental helicopter from Patuxent Naval Air Station.

Appendix I

LUBBOCK, TEXAS - 25 August 1951

I. DISCUSSION OF THE INCIDENT

The first of a series of sightings related to this incident occurred the evening of 25 August 1951 at approximately 2110 CST. Four Texas Technical College professors were sitting in the backyard of one of the professor's homes observing meteorites in conjunction with a study of micrometeorites being carried out by the college. At 2120 they observed a group of lights pass overhead from N to S. The lights had about the same intensity as high cirus clouds on a moonlight night. The altitude was not determined but they traveled at a high rate of speed. The pattern of the lights was almost a perfect semi-circle containing from 20 to 30 individual lights. Later in the evening a similar incident was observed and during a period of about three weeks a total of approximately twelve (12) such flights were observed by these men.

The group of men included:

a. The Head of the Petroleum Engineering Department
b. Professor of Geology, has PhD.
c. Professor of Physics, has PhD.
d. Professor of Chemical Engineering, has PhD.

Besides the above four men, the following have observed the incidents:

a. Professor of Mathematics, has PhD.
b. Graduate student working on PhD.

In addition, a Professor of Astronomy was consulted on the incident, but he did not observe any of these flights.

The above mentioned men took a personal interest in the phenomena and undertook a study of the objects. Attempts were made to obtain an altitude measurement by laying out a measured base line perpendicular to the usual flight path of the object and placing angle measuring devices at the end of the base line, however, all their attempts failed because the objects did not appear on the nights the observers were waiting for them.

From the series of observations, the following facts were obtained:

a. The angular velocity of the object was very nearly 30° of arc per second.

b. There was no sound that could be attributed to the object.

c. The flight path of the object was from N to S in the majority of the flights although some were NE to SW.

d. On several nights there were two or three flights.

[redacted]

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e. The color of the lights was blue-green.

f. There were from 15 to 30 separate lights in each formation.

g. The first two flights observed were a semi-circle of lights but in subsequent flights there was no orderly arrangement.

h. The object always appeared at an angle of about 45° from horizontal in the north and disappeared at about 45° in the south. The object did not gradually come into view as would an aircraft approaching from a distance, neither did it gradually disappear.

i. There was no apparent change in size as the object passed overhead.

j. The "angular span" was estimated to be 10°.

Attempts were made to obtain the relative height of the object in respect to clouds. However, these attempts were also unsuccessful due to the fact that the objects passed between widely scattered clouds.

Attempts were made to determine whether or not there was any form between the lights by trying to see stars between the lights. These also was unsuccessful due to the short time the object was in view.

This phenomena was observed by at least one hundred people in and around Lubbock, Texas. Some of these people were of the opinion that the objects were birds reflecting lights from the city.

On the evening of 31 August 1951 at about 2330 CST, a college freshman from Texas Tech observed a flight of the unidentified objects pass over his home. The flight was observed through an open window. Upon observing the first flight of the objects, the observer obtained his camera and went into the backyard of his home in an attempt to get photographs of additional flights of the object. (Comment: This would be logical as by 31 August 1951 these flights of the objects, and the fact that several flights might occur in an evening, was well known.) Two more flights of the object allegedly did occur and were photographed. Two photos of one flight and three of another were obtained. ATIC has four of the negatives but the other one was lost or misplaced by the photographer. The photographs show a V-shaped formation of lights. In one photo a single-V of lights appear, while on three photos there is a double-V. The separate lights, which appear to be pinpoint light sources, vary in intensity.

(See Appendix II for possibly related incidents.)

II. STATUS OF THE INVESTIGATION

A. Trip to Lubbock, Texas

A trip was made to Lubbock, Texas, on 6-9 November 1951 to obtain more details on the incident. Many people who had seen the object or who were involved in the incident were interrogated. A conference was held with the college professors and they prepared a signed statement describing the objects they they observed.

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[redacted]

The photographer was interrogated, in conjunction with OSI, in regard to the photographs of the objects. His account of the incident seemed logical, and there were no obvious indications of a hoax. The photographer had previously been interrogated by the Lubbock newspaper and the photos inspected by Associated Press and Life Magazine representatives. It was their opinion that the photos were not obviously a hoax. The college professors were doubtful as to whether or not the photographs were of the same objects that they had observed because:

1. They had never observed a V-shaped formation of lights. This is not too significant, however, as the arrangement of the lights that they observed varied and since there were several flights the college professors possibly did not see the flights that were photographed. In addition, the photographer states that the object appeared to be U-shaped but when he developed the negatives, the object was V-shaped.

2. The objects that the professors observed were, in their opinion, not bright enough to be photographed. This is, however, an estimate and could be in error.

It was found that one school of thought of the people in the Lubbock area was that the objects were some type of migratory birds reflecting light from the city. Several people reported that they definitely knew the objects were birds because they could see wings "flapping". It is very possible that some of the people who were looking for the object did see ducks as there were duck flights passing over during the period.

The college professors do not believe the theory that the objects were birds, but they are giving the possibility more thought. If they were birds, they would have to be relatively low to give the illusion of high speed. An occasional flight of birds might pass low over a city on a clear night but it is highly doubtful if they would continue to do this for several nights. Migratory birds usually try to keep away from cities.

The Federal Wild Life Game Warden was visited and although he was not familiar with the incident he doubted if the objects were birds. He stated that they could have been, however. The most likely suspect, if it is a bird, is a member of the Plover family which has a pure white breast, but unless there was a sudden influx of the birds into the Lubbock area, the game warden doubted if there would be enough of these birds to make up as many flights as were observed.

If the photos are authentic, the objects very probably are not ducks because an experienced photographer from the Lubbock Avalanche Newspaper attempted to get photos of ducks using both natural light and flash, but failed.

B. Analysis of Photos by Wright Air Development Center

The Photographic Reconnaissance Laboratory of WADC made a preliminary analysis of the photographs. The analysis was made by inspecting the negatives in a comparator microscope. Their conclusions were:

1. The images on the negatives were caused by light striking unexposed film, (i.e., the negatives were not retouched).

2. The individual lights in the "formation" varied in intensity.

3. The intensity was greater than any surrounding stars as the stars did not register. (The photos were taken under CAVU conditions.)

4. The individual lights changed position in the "formation".

C. Reinterrogation of the Photographer

The OSI was requested to reinterrogate the photographer in another attempt to determine the authenticity of the photographs. The details of this reinterrogation have not been received but a preliminary report stated that there were no indications that the photographs were not authentic.

D. Future Investigations

A trip to Lubbock, Texas, will be made during January. Arrangements are being made to have a Project Grudge consultant and a physicist accompany Project Grudge personnel. If the photographs are authentic, they are important in that:

1. They will give an accurate measurement of the "angular span".

2. The light source, although it appeared to be of low intensity to the eye, was highly actinic.

3. The movement of the individual lights in the formation can be studied further.

4. Density comparison tests can be made.

Appendix II

ALBUQUERQUE, NEW MEXICO - 25 August 1951

I. DISCUSSION OF INCIDENT

On the evening of 25 August 1951, at 2158 MST, a Sandia Base Security Guard and his wife observed what they described to be a flying wing type aircraft similar to the Northrop Fly-Wing Bomber (B-49) pass over the backyard of their trailer home in the east part of Albuquerque. They judged the wing span of the aircraft to be about one and one half times the wing span of a B-36, with which they were familiar. The object was flying low, the altitude was thought to be about 800 ft. - 1000 ft., and there was no sound that could be attributed to the object. The color of the object was not apparent due to the twilight but dark chordwise stripes were noticed under the wings. Six to eight pairs of soft flowing lights were noticed on the trailing edge of the wing. The speed was judged to be about 300 - 400 mph and the object was on a heading of approximately 160°.

(See Appendix I for possible related incident.)

II. WEATHER

Broken clouds at 17,000 ft., visibility five miles, wind S at 5 mph.

III. STATUS OF INVESTIGATION

The possibility of this being a known aircraft was checked with negative results. The AC and W Radar Station at Kirtland AFB did not observe any unusual or unidentified aircraft.

The guard's background was checked and since he has a "Q" clearance, it has been assumed that he apparently is mentally stable.

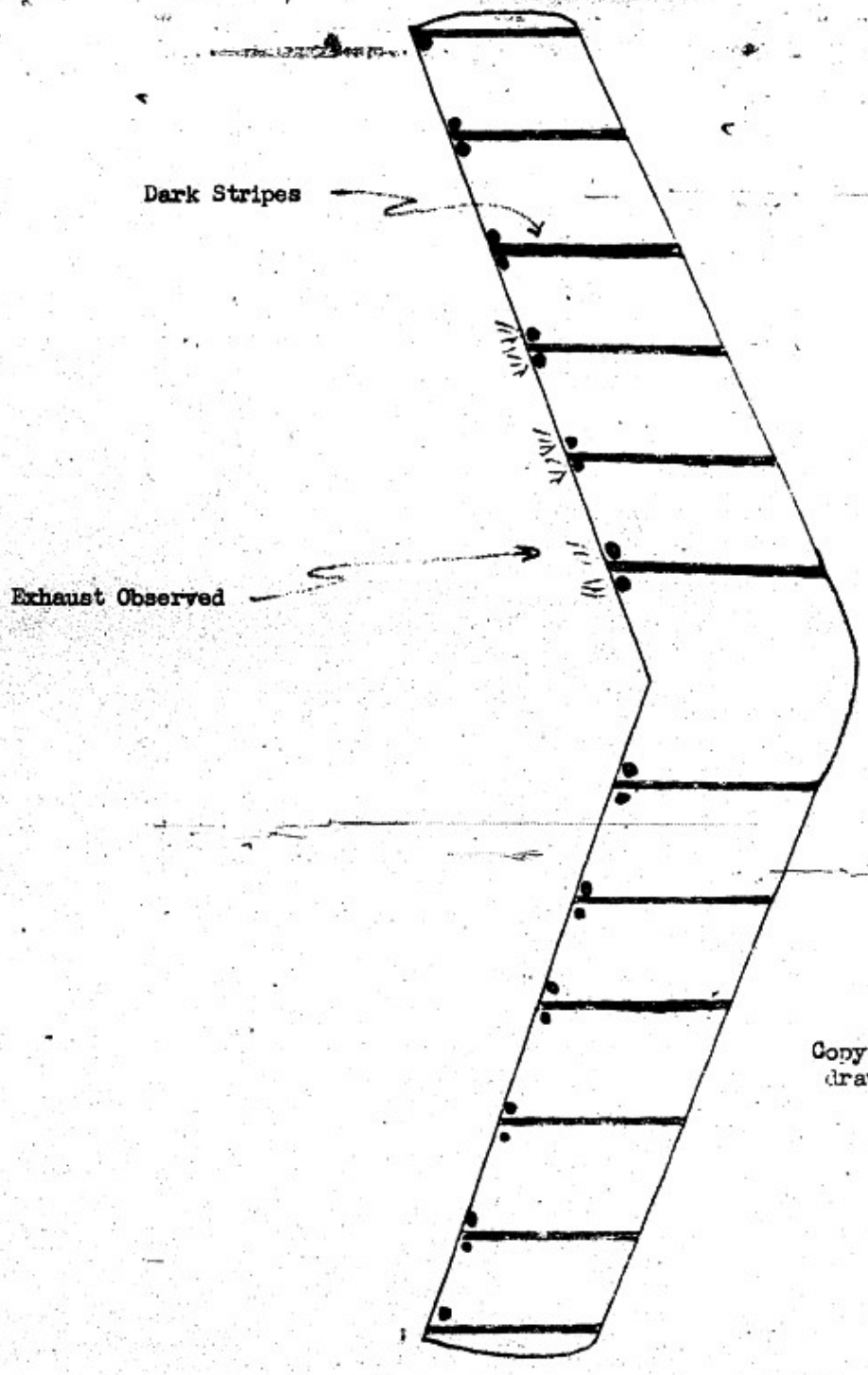
An investigation was made to determine whether or not any one else had seen the object but only negative results were obtained.

The photographs referred to in Appendix I were sent to the OSI at Kirtland AFB. These photos were shown to the sources and they stated that the photos resembled the "exhaust" or light pattern of the object. A sketch, drawn by the observers, is shown in this Appendix.

It is interesting to note that a very similar sighting took place in Lubbock, Texas. The exact time and date of the sighting could not be determined due to the fact that the observer believed she had seen an illusion of some type and did not report the incident. The only date that could be given was "late in August or early September".

IV. CONCLUSIONS

None. The investigation will be continued until the authenticity of the photos in Appendix I can be determined.



Copy of Sketch
drawn by Source

Appendix III

MATADOR, TEXAS - 31 August 1951

I. DISCUSSION OF THE INCIDENT

On 31 August 1951 at approximately 1245 CST two ladies were driving in an automobile several miles north of Matador, Texas. The object was described as a pear-shaped object about the length of a B-29 fuselage, aluminum or silver in color, which readily reflected the sunlight. The object had a port or some type of aperture in the side and moved through the air with the small end forward. There was no sign of any exhaust and no noise was heard.

As the two ladies were driving north from Matador, Texas, the driver of the automobile first noticed the object about 150 yards ahead of the automobile. They stopped and both ladies got out to observe the object. It was drifting slowly in an eastward direction at a speed they judged to be less than the speed required to take off in a Cub aircraft and an altitude of about 120 ft. Seconds later the object began to ascend rapidly and moved out of sight into the wind in a circular ascent. (The wind at this time was from NE at about 5-7 knots.)

A background investigation showed that both women were of excellent character.

This incident is of interest because it was observed during the same period as the objects over Lubbock, Texas (See Appendix I).

II. WEATHER

A. 1230 CST - Reese AFB - 31 August 1951
Estimated ceiling 6,000 ft., broken clouds, with thin scattered clouds at 25,000 ft. Visibility 15 miles. Wind ENE at 3 knots.

B. 1230 CST - Childress, Texas - 31 August 1951
Estimated ceiling 25,000 ft., overcase. Visibility 15 miles. Wind NNE at 7 knots. Towering cumulus clouds in SE quadrant.

III. STATUS OF INVESTIGATION

It has been reported that a road repair crew saw the same object later on the same day. Attempts will be made by Project Grudge personnel to contact members of this road crew and obtain their statements. There were also reports of crop dusting activity in the area, so attempts will be made to determine whether or not the ladies could have seen this activity.

[redacted]

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Appendix IV

MARCH AIR FORCE BASE - 23 September 1951

I. DISCUSSION OF INCIDENT

The first report of this incident, which appeared in Status Report No. 1, proved to be incomplete and misleading. Further investigation has corrected the discrepencies and the following account of the incident is considered to be accurate.

At approximately 0700 PDST, two F-86 aircraft were scrambled from George Air Force Base, California, on a routine mission. The flight was vectored to 118° 40'W - 33° 50'N by GCI. (See inclosed overlay.) The flight orbitted the position and took up a heading toward Long Beach Radio. At approximately 0755 PDST the flight reported to GCI that they observed an unidentified object high at 12 o'clock. The flight was 30 seconds out of Long Beach Radio at this time. The object appeared to be in a left orbit at about 50,000 ft. The object could not be picked up by the ground radar, however, visual contact was maintained. The object continued a left orbit and passed over the two aircraft. Attempts were made by the F-86's to identify the object but they were unsuccessful due to the altitude of the object and a fuel shortage. At approximately 0810 or 0815 the flight was released by the ground controller and they returned to George Air Force Base. The object appeared to be an aircraft with 45° swept wings and bright silver in color. When last seen the object was in a left orbit, or circling to the left. The pilot's opinion was that it was a swept wing type aircraft.

At approximately 0800 PDST four additional F-86 aircraft were scrambled from George AFB to relieve the two above mentioned F-86's. The four aircraft split into two, two-ship elements, denoted as Flight 2-A and 2-B on the inclosed overlay. Flight 2-A was vectored to a position at 117° 30'W and 30° 20'N. They arrived at this position at approximately 0810 and sighted the object high at 12 o'clock at what appeared to be over Muroc AFB. A steady climb was made to 43,000 ft. and the object was found to be near March AFB. The object appeared to be in a controlled orbit to the right and left at 50,000 to 55,000 ft. The two aircraft stayed in the area for 10-15 minutes before breaking off the intercept due to a fuel shortage and landed at 0845 PDST. The object appeared to be a swept wing aircraft.

The second element of the group, noted as Flight 2-B on the overlay, observed the object soon after take-off. The object appeared to be going south. The flight made a series of climbing turns under the object as they climbed to 43,500 ft. The object was in a wide right turn. At approximately 0925 PDST the aircraft broke off the attempted intercept and returned to their base. This flight reported that the object appeared to be round and silver.

No more intercepts were attempted. At no time was the object observed on the radar screen nor was it reported to be observed visually from the ground. The F-86's, however, were continually tracked by radar.

[redacted]

The F-86's were unable to climb to the estimated altitude of the object due to the fact that they were carrying external fuel tanks and elected not to jettison them.

II. STATUS OF INVESTIGATION

At 0700 PDST a radiosonde balloon was released from the Long Beach Municipal Airport. This balloon was lost at 0743 PDST, eight miles from the airport on a bearing of 95° true, due to a malfunction of the tracking equipment. (See Point A on overlay.) At this time the balloon would have been at approximately 40,000 ft. The winds above 40,000 ft. are unknown but it is logical to assume that at this altitude they will be relatively constant in direction. Assuming a relative constant direction of 270° and an average velocity of 30 knots above 40,000 ft. (the wind at 40,000 ft. was 280° at 21 knots) the possible flight path of the balloon can be plotted on the overlay.

The original sighting by Flight 1 could very possibly have been the balloon as their heading was toward Long Beach Airport. The altitude of the F-86's at the time of the sighting is unknown but was probably below 40,000 ft. At 0755, the time of the original sighting, the balloon would be at 50,000 to 55,000 ft. and approximately ten miles directly ahead of the two aircraft. The apparent orbitting of the balloon cannot be explained. The balloon would make a gradual turn due to wind shifts but these are so gradual that it is doubtful if the movement would be apparent from an aircraft as fast as an F-86.

Referring to the ground track of Flight 2-A, if a 30 knot wind at 270° is assumed, at 0810, the approximate time the F-86's sighted the object from a 355° TC, the balloon would be at B on the overlay. The balloon would probably be at an altitude of 60,000 ft. and nearly straight ahead of the aircraft. Due to the size of the balloon, the distance could have been misjudged and the balloon could have appeared to be near Muroc. Once again the orbitting of the object cannot be explained.

The attempted intercept by Flight 2-B cannot be explained. If the ground track given by the leader of Flight 2-B is correct it is very doubtful that the flight was observing a balloon. The time that they sighted the object is not known but if it is assumed that they flew beneath the object for 30 minutes, it is highly doubtful that a wind shift of nearly 360° could occur above 60,000 ft. to give the illusion of a turn.

The possibility of this object being an experimental aircraft from some southern California aircraft plant, naval airfield, or from Edwards Air Force Base was checked with negative results. No other balloons were released in the vicinity.

III. CONCLUSIONS

With the information available, it cannot be concluded that the object was definitely the radiosonde balloon released from Long Beach Municipal Airport. However, since the balloon was near the flight path of two of the F-86 elements, and assuming that the orbitting of the object was an illusion due to the relative motion between the balloon and the aircraft, it can be concluded that the unidentified object was very possibly a radiosonde balloon.

The third attempted intercept, the one in which the object was followed in a wide turn, cannot be explained.

It is not believed that further interrogation would produce any additional significant details due to the fact that some of the personnel involved have been transferred overseas and due to the time since the incident.

Appendix V

TERRE HAUTE, INDIANA - 9 October 1951

I. DISCUSSION OF THE INCIDENT

On 9 October 1951 at 1342 CST, a CAA Chief Aircraft Communicator observed a silver object pass directly overhead while he was at Hulman Municipal Airport, five miles east of Terre Haute, Indiana. The object was judged to be approximately the same size as a 50 cent piece held at arm's length. The object passed overhead at a very high rate of speed going in a southeasterly direction, passing from directly overhead to the horizon in about 15 seconds. There was no sound or vapor trails. The shape and general form of the object could be seen as the object passed over the horizon and out of sight.

(For related incident, see Appendix VI.)

II. WEATHER

Clear, bright sun, no clouds or haze.

III. STATUS OF INVESTIGATION

Further investigation revealed no additional information.

IV. CONCLUSIONS

None.

Appendix VI

PARIS, ILLINOIS - 9 October 1951

I. DISCUSSION OF THE INCIDENT

On 9 October 1951, at approximately 1345 CST, a private pilot enroute from Greencastle, Indiana, to Paris, Illinois, sighted a silver object just east of Paris, Illinois, at 5,000 ft. altitude. The object appeared to be stationary in as much as it did not increase or diminish in size with the approach of the aircraft. The object then started to travel in a northeasterly direction south of the Newport, Indiana, Atomic Energy Plant.

(See Appendix V for related incident.)

II. WEATHER

Clear, bright sun, no clouds or haze.

III. STATUS OF INVESTIGATION

Further investigation revealed no significant facts. It was impossible to determine whether or not there were any jet aircraft in the area due to the lapse of time since the sighting.

IV. CONCLUSIONS

None.

Appendix VII

MINNEAPOLIS, MINN. - 11 October 1951

I. DISCUSSION OF INCIDENT

The only information available on this incident is a letter quoted below:

"TIME: 0630, 11 Oct 51. Dick Reilly and I were flying at 10,000 ft. observing the grab bag balloon when I saw a brightly glowing object to the SE of University of Minnesota Airport. At that time we were a few miles north of Minneapolis and heading east. I pointed it out to Dick and we both made the following observation:

"The object was moving from east to west at a high rate and very high. We tried keeping the ship on a constant course and using reinforcing member of the windshield as a point. The object moved past this member at about 50 degrees per second.

"This object was peculiar in that it had what can be described as a halo around it with a dark undersurface. It crossed rapidly and then slowed down and started to climb in lazy circles slowly. The pattern it made was like a falling oak leaf inverted. It went through these gyrations for a couple minutes and then with a very rapid acceleration disappeared to the east. This object, Dick and I watched for approximately five minutes.

"I don't know how to describe its size, because at the time I didn't have the balloon in sight for a comparison.

"Shortly after this we saw another one, but this one didn't hang around. It approached from the west and disappeared to the east, neither one leaving any trace of vapor trail.

"When I saw the second one I called our tracing station at the U. of M. Airport and the observers there on the theodolite managed to get glimpses of a number of them, but couldn't keep the theodolite going fast enough to keep them in the field of their instruments. Both Doug Smith and Dick Dorian caught glimpses of these objects in the theodolite after I notified them of their presence by radio."

II. WEATHER

Unknown, but evidently clear.

III. STATUS OF INVESTIGATION

Further investigation produced no additional information as to the identity of the object. The theodolite operator was interrogated and stated that he could only observe "a brief blur for about two seconds". During his brief observation, the object appeared to be a smoky grey cigar shaped object. It left no vapor trail and gave off no reflection.

All observers were positive of the following facts:

A. The object, though vaguely defined and blurred, retained a definite shape.

B. No vapor trails, exhaust flashes, or jet propulsion were observed.

C. The object definitely seemed to be controlled. The sources are all experienced engineers with General Mills Balloon Projects and have been observing all types of balloons for several years.

IV. CONCLUSIONS

No conclusions can be made. It is significant however, that the sources can be graded as very reliable and that they observed an object with which they were entirely unfamiliar.

Appendix VIII

SOUTHERN MICHIGAN - 24 November 1951

I. DISCUSSION OF INCIDENT

On the evening of 24 November 1951, seven people observed an unidentified aerial object, from four separate locations in Southern Michigan. The object was observed in the SE quadrant traveling at speeds "much faster than a Jet" at an apparently low altitude (below 2,000 ft. or 2° - 4° above the horizon) in all the observations. The object traveled horizontal to the earth and in one instance was noted to lose altitude just before it disappeared. No sounds were heard by any of the observers. In each case the time the object was in sight was 5-6 seconds or less.

Additional information is given below and in inclosed overlay which shows apparent track of objects. It will be noted that these are only the apparent tracks.

Location	Time	Shape	Color	Trail	Course	Apparent Distance (miles)	Observer
Selfridge AFB	1820 E	"Egg"	White	Red	WSW	2-3	AF PFC
Selfridge AFB	1820 E	"Football"	White	Orange red	W	1	AF PFC
Battle Creek	1825 E	Oval	White	White	SW	10-20	AF Pvt
Grand Rapids	1824 E	Round	White	None	SW	-	Tower Operator
Coopersville	1825 E	Round	Bluish White	None	SW	30-40	Airline Crew (Airborne)

II. WEATHER

CAVU and exceptionally clear at all points of observation.

III. STATUS OF THE INVESTIGATION

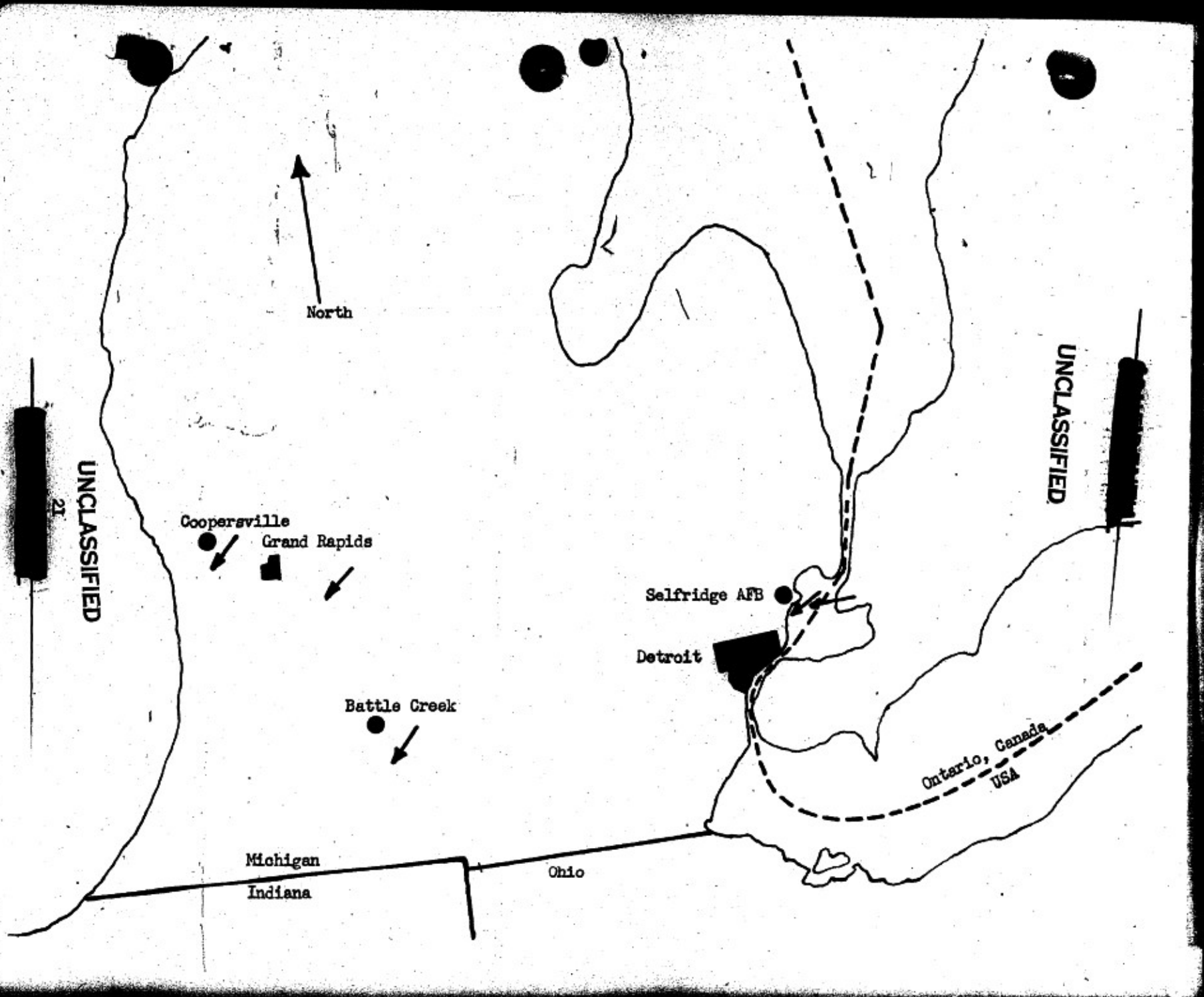
The possibility of jet aircraft in the area, unidentified radar returns, and known meteoric or aurora phenomenon were checked with negative results. From the reports, it is reasonable to assume that all the observers sighted the same object. There is a time span of five minutes between various sightings but this could be due to errors in the watches of the observers. Assuming that the tower clock would be the most accurate, the time would be 1824 EST. From the estimates of

the altitude (i.e. appeared low), it is apparent that the object must have been a comparatively great distance from all the observers. The fact that the observers in Grand Rapids and over Coopersville did not observe a tail or trail can be explained by the fact that they were farther away from the object.

The actual flight path of the object was probably high over Ontario, Canada. It would probably be possible to determine the exact location by collecting reports or interrogations in Canada. It is not believed that this would be worth the effort, however, as it would still not definitely identify the object unless it had been observed by competent astronomers.

IV. CONCLUSIONS

It is concluded that the object observed in Southern Michigan on 24 November 1951 was a large meteor-like object that probably passed over Ontario, Canada, or upper New York State.


North
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UNCLASSIFIED
Coopersville
Grand Rapids
Selfridge AFB
Detroit
Battle Creek
Ontario, Canada
USA
Michigan
Indiana
Ohio

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Classification cancelled
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AUTH: ROBERT J. FRIEND, MAJOR, USAF
By Robert J Friend Major
Signature and Grade
Date 9 SEPT 1960

PROJECT GRUDGE - REPORT NO.3

PROJECT NO. 10073

31 JANUARY 1952

Classification cancelled
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AUTH: ROBERT J. FRIEND, MAJOR, USAF
By Robert J Friend, Major
Signature and Grade
Date 9 SEPT 1960

DEPARTMENT OF THE AIR FORCE · UNITED STATES OF AMERICA ·

AIR TECHNICAL INTELLIGENCE CENTER

WRIGHT-PATTERSON AIR FORCE BASE
DAYTON, OHIO

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Chief, Air Technical Intelligence Center
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AUTH: ROBERT J. FRIEND, MAJOR USAF
By Robert J. Friend, Major
Signature and Grade
Date 9 SEPT 1960

This report is the third of a series of monthly status reports of Project Grudge. Each report will be written on or near the last day of the month and will contain a list of all incidents reported during the month covered by the report. The reports that are considered to be outstanding will be summarized in the appendices of the report so that more details can be presented. The overall status of the project will also be presented.

Additional information may be obtained on any incident by directing requests to Chief, Air Technical Intelligence Center, Attention: ATIAA-2c, Wright-Patterson Air Force Base, Dayton, Ohio.

[redacted]

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STATUS OF PROJECT GRUDGE

I. OVERALL STATUS

A. Files

All of the material in ATIC that relates to sightings of unidentified aerial objects has been reviewed and filed. All data on each sighting has been placed in a separate folder and the folders filed chronologically. There are a total of 695 incidents. These vary from nebulus reports from very questionable sources to more factual reports from reasonably reliable sources such as AF pilots, airline pilots and balloon observers.

The factual details of each incident have been placed on 5" by 8" cards and these cards are being cross-indexed. All the cards have been reproduced and cross-indexing is about 50 percent completed. When this phase of the project is finished, it will be possible to make a breakdown of all reported sightings as to the predominent shapes, size, course, geographical locations, etc.

B. Location of Additional Files

During the past month, a trip was made to Washington, D. C. to locate additional data on sightings. It was found that both the D/I library and TCB have such files. In the near future a trip will be made to Washington to review these files and obtain additional sighting reports.

C. Map of Sightings

A map has been prepared, showing all of the sightings in the United States. Colored tacks are used to designate sightings by years.

The plot of sightings shows that there is a concentration of sightings in the area of:

1. Dayton, Ohio
2. Columbus, Ohio
3. White Sands, New Mexico
4. Albuquerque, New Mexico
5. Oak Ridge, Tenn.
6. Camp Hood, Texas

No conclusions can be made or other facts about the distribution of the sightings stated until a further study of the distribution of sightings has been made.

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[redacted]

D. Directives for Reporting Incidents

The directive which outlines the reporting procedures to be used in this project is AFOIN-C/CC-2 letter dated 19 December 1951, subject: "Reporting Information on Unidentified Flying Objects". This directive is not believed to be adequate to cover all phases of the project and it is being revised. The revision of this directive has been given top priority as it is believed that the project cannot function properly until satisfactory reporting channels are set up.

E. Consultants

The consultants that will be obtained to assist in the project have finished their preliminary survey of past work done on the project and will submit their formal proposal during the early part of February. During the past month one of their members accompanied Project Grudge personnel on two interrogations to familiarize them with how reports are investigated.

F. Difficulties in Obtaining Reports

Recently several airline and Air Force pilots have been queried as to their feelings on reporting the sightings of unidentified aerial objects. The queries were predicated by reports that sightings were not being reported due to stigma that has been placed on the project by unfavorable newspaper releases, etc. Only a very few individuals were contacted, however, these people stated that they would be very reluctant to report any type of unidentified object to the Air Force. One pilot summed up the situation by stating, "If a space ship flew wing-tip to wing-tip formation with me, I would not report it." This feeling among people who are in a position to submit good reports is a great handicap to the objective of getting reliable data. The exact nature of some of the objects reported have not been determined, therefore, there is always the possibility that there exists some type of unconventional vehicle possessing extraordinary performance and characteristics. If such a vehicle should appear, its detection would be hampered by the reluctance to report sightings of unusual aerial objects.

A series of briefings of Air Force commanders is being tentatively planned to explain the functions and findings of this project in an attempt to break down the adverse feelings on reporting that are held by many people.

G. Radar Search

In compliance with suggests of the Directorate of Intelligence, a preliminary conference has been held on the possibility of using electronic means to detect and obtain data on the unidentified objects that are being reported. Radar would be used in conjunction with photographic equipment to accomplish this. In the past there have been unexplained radar contacts but whether or not these were due to weather phenomena, malfunction of the sets or actual targets has not been determined.

Further conferences will be held on this matter. To date, nothing definite has been decided.

H. Briefing of General Garland

On 29 January 1952, Brig Gen W. M. Garland, Assistant for Production, Director of Intelligence, Hq USAF, and members of his staff were briefed as to the status of the project.

II. REPORTS OF SPECIFIC INCIDENTS

A. Inclosed Summary List of Incidents

The inclosed list of incidents is (1) a summary of all incidents reported during the period 1 January 1952 to 31 January 1952; and (2) those incidents reported in Status Report No. 2, dated 31 December 1951, which are still pending or have been closed during the past month.

SIGHTINGS OF UNIDENTIFIED OBJECTS

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED
25 Aug 51	2110	Lubbock, Texas	Group of lights that have been seen on many occasions.	4 Sec.	None	30° Arc/Sec
25 Aug 51	2158	Albuquerque, N.M.	Dark flying wing type a/c with about 1 1/2 times the wing span of a B-36.	30 Sec.	None	300-400 mph
31 Aug 51	1245	Matador, Texas	Pear-shaped aluminum object seemed to hover then leave the area at high speed.	Several seconds	None	Hovering to high speed
10 Oct 51	1010	Minneapolis, Minn.	Round, silver object seen by pilots trailing a balloon.	2 Min.	None	High
11 Oct 51	0650	Minneapolis, Minn.	Round, silver object seen by pilots trailing balloon and by ground observer team.	Several Minutes	None	High
24 Nov 51	1553	Minneapolis, Minn.	Flying wing shaped object.	Unknown	None	Hovering
7 Dec 51	1412	Kansas City, Mo.	Described as perfectly round, with inner core resembling fuselage of small a/c with tapered and stubby wings.	Approx. 1 Min.	None	Unknown
7 Dec 51	0815	Oak Ridge, Tenn.	Object appeared to be square, rose and descended three times at high rate of speed. Neither radar nor fighter aircraft could make contact.	2 Min.	None	High
10 Dec 51	1820 EST	Buffalo, N. Y.	Large, white, extremely brilliant and tubular in shape.	15 Sec.	None	240 Knots
12 Dec 51	2150	Hastings, Minn.	White object resembling a kite about [illegible]0 ft. below a/c.	3-4 Min.	None	360-400 mph
22 Dec 51	0625	Hayden, Ohio	Extremely bright light in sky. Appeared to be hovering.	1 Hr.	None	Hovering
22 Dec 51	1030	Columbus, Ohio	F-84 Pilot observed object which appeared to be a/c with no tail assembly. Object seemed to be rolling. An unsuccessful attempt was made to intercept the object. (See Appendix I)	1 1/2 Min.	None	Same as F-84
19 Jan 52	1956	Cedar Keys, Fla.	Large blue-green fireball observed by B-29 crew. Descended and exploded near the ground.	3 Sec.	None	---
21 Jan 52	0950	Mitchell AFB, N.Y.	Navy TBM attempted to intercept disc-shaped object with negative results. (See Appendix II.)	Unknown	None	300-500 Knots (Est.)
29 Jan 52	2300 and 2320	Korea	A disk, judged to be 3 ft. in diameter approached two different B-29's. (See Appendix III.)	5 Min. and 1 Min.	---	Same as B-29

ATIC FORM NO. 328
1 DEC 51

SIGHTINGS OF UNIDENTIFIED OBJECTS

OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
...y occasions.	4 Sec.	None	30° Arc/Sec	Unknown	180°	Varied	Further investigation has produced no new developments. For details of the incident, Status Report No. II. Details of this incident will be published in a special report.
...2 times the wing span of a B-36.	30 Sec.	None	300-400 mph	1000 ft.	160°	Sandia Base guard and wife	No conclusions - Investigation closed.
...r then leave the area at high speed.	Several seconds	None	Hovering to high speed	Low to high	90°	Two ladies	No conclusions - Investigation closed.
...ing a balloon.	2 Min.	None	High	High	SE	Balloon Obs.	Further investigation of both of these incidents has lead to no conclusions. The investigation is closed. (See Status Report No. II for details.)
...ng balloon and by ground observer team.	Several Minutes	None	High	High	Unknown	Balloon Obs.	
	Unknown	None	Hovering	25,000 ft.	90°	AF Pilot	No conclusions.
...e resembling fuselage of small a/c with	Approx. 1 Min.	None	Unknown	Unknown	NW	Civilian	No conclusions. No further information could be obtained.
...ersed three times at high rate of speed. ...make contact.	2 Min.	None	High	Varied	None	Civilian Guard	No conclusions.
...ular in shape.	15 Sec.	None	240 Knots	3000-4000 ft.	S to N	USAF Pilot	No conclusions. Probably a fireball of some type.
...ft. below a/c.	3-4 Min.	None	380-400 mph	9,000 ft.	Unknown	USAF Pilot	No conclusions
...to be hovering.	1 Hr.	None	Hovering	High	—	Civilian	Proved to be "Christmas Star".
...to be a/c with no tail assembly. Object ...attempt was made to intercept the object.	1 1/2 Min.	None	Same as P-84	25,000 ft. (Est.)	285°	P-84 Pilot	See Appendix I.
...9 crew. Descended and exploded near the	3 Sec.	None	—	—	—	B-29 Crew	Fireball type phenomena. No investigation. No conclusions.
...ed object with negative results.	Unknown	None	300-500 Knots (Est.)	Unknown	Varied	Navy Pilot	See Appendix II.
...proached two different B-29's.	5 Min. and 1 Min.	—	Same as B-29	Same as B-29	Same as B-29	Members of two B-29 crews	See Appendix III.

APPENDIX I

Columbus, Ohio - 22 December 1951

I. DISCUSSION OF INCIDENT

On 22 December 1951 at approximately 1030 EST, an F-84 pilot sighted an unidentified object five miles east of Columbus, Ohio. The object, which looked like an aircraft with no tail surfaces, appeared to be rolling on its lateral axis. The object was on a reciprocal heading and higher than the F-86. The pilot made a turn in an attempt to intercept the object but lost it in the sun.

II. STATUS OF INVESTIGATION

At approximately 1000 EST a weather balloon was released from the Columbus Municipal Airport. The wind, which was from the west, would have blown the balloon into the general vicinity of the sighting. More definite information on the balloon launching has been requested.

III. CONCLUSIONS

No conclusions can be made until more information on the balloon launching is obtained.

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APPENDIX II

Mitchell Air Force Base - 22 January 1952

I. DISCUSSION OF INCIDENT

At approximately 0950 EST on 22 January 1952, a U. S. Navy pilot flying a TBM type aircraft sighted a disc-shaped object near Mitchell Air Force Base, New York. The object appeared to be light, "like a nylon parachute canopy", with a dark under surface. It was estimated to be 20 feet to 30 feet in diameter with a 3:1 diameter to thickness ratio.

The object appeared to be circling Mitchell Air Force Base and the observer was able to get near the object by cutting inside on turns.

II. STATUS OF THE INVESTIGATION

Additional information has been requested from Mitchell Air Force Base. No conclusions can be made on data contained in preliminary wire message.

APPENDIX III

Korea - 29 January 1952

I. DISCUSSION OF INCIDENT

On the night of 29 January 1952 at 2300 and again at 2324, local Korea time, two B-29 crews at different locations observed similar objects near their aircraft. They described them as a disk, approximately three feet in diameter, and with a color similar to the sun. In one instance the object stayed beside the B-29 for five minutes and in the other for one minute.

II. STATUS OF THE INVESTIGATION

More details on this incident have been requested.

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Classification cancelled
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AUTH: ROBERT J. FRIEND, MAJOR, USAF.
By Robert J. Friend, Maja
Signature and Grade
Date 9 SEPT 1960

PROJECT GRUDGE - REPORT NO.4

PROJECT NO. 10073

29 FEBRUARY 1952

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AUTH: ROBERT J. FRIEND, MAJOR, USAF
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T52-5836

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AUTH: CG ATIC
BY: A.B. DEYARMOND
DATE 13 Mar 52

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AUTH: ROBERT J. FRIEND, MAJOR USAF
By Robert J. Friend, Major
Signature and Grade
Date 9 SEPT 1960

This report is the fourth of a series of monthly status reports of Project Grudge. Each report will be written on or near the last day of the month and will contain a list of all incidents reported during the month covered by the report. The reports that are considered to be outstanding will be summarized in the appendices of the report so that more details can be presented. The overall status of the project will also be presented.

Additional information may be obtained on any incident by directing requests to Chief, Air Technical Intelligence Center, Attention: ATIAA-2c, Wright-Patterson Air Force Base, Dayton, Ohio.

The security classification of this report has been raised from Confidential to Secret due to the inclosure of reports of unidentified aerial objects which were classified Secret by the originating agency.

T52-5836

UNCLASSIFIED

~~SECRET~~

STATUS OF PROJECT GRUDGE

I. OVERALL STATUS

A. Files

All of the material in ATIC that relates to sightings of unidentified aerial objects has now been filed and cross-indexed. Over 600 reports have been cross-indexed under the main divisions of:

1. Time of Sighting
2. Shape
3. Size
4. Course
5. Number of Objects Seen
6. Sounds
7. Date
8. Location
9. Occupation of Source
10. Color
11. Apparent Speed
12. Apparent Altitude
13. Length of Time Observed
14. Maneuvers
15. Conclusions

In many instances it has been difficult to establish sub-divisions due to the great variety of descriptions. In these instances, certain broad categories were established.

B. Location of Additional Files

The D/I Library files were searched during the past month and approximately 50 additional incidents were located. Copies of these have been requested. It is believed that the ATIC file on unidentified aerial objects now contains a large majority of all incidents reported to the Air Force since 1947.

C. Directives for Reporting Incidents

A new proposed directive for reporting sightings of unidentified aerial objects has been sent to the D/I for approval and distribution. This directive will replace existing directives and provide more expeditious channels for reporting sightings.

D. Project Twinkle

This Center has been receiving a number of reports on the phenomena which has been termed "green fireballs". This specific phenomena has been

investigated by the AF Cambridge Research Laboratories under the title of "Project Twinkle". The Cambridge Laboratory has discontinued the project and the conclusions were indefinite.

This phenomena which has received some publicity in the past four months is reported to be similar to a large meteor in some respects. They are green in color, have a flat trajectory, appear to be much lower than an average meteor, and are silent.

II. REPORTS OF SPECIFIC INCIDENTS

A. Inclosed Summary List of Incidents

The inclosed list of incidents is (1) a summary of all incidents reported during the period 1 February to 29 February 1952; and (2) those incidents reported in Status Report No. 3, dated 31 January 1952, which are still pending or have been closed during the month.

SIGHTINGS OF UNIDENTIFIED OBJEC

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND
22 Dec 51	1030	*Columbus, Ohio	F-84 pilot observed —	1 1/2 Min.	None
20 Jan 52	1920	Spokane, Wash.	A brilliant meteor-like object was observed traveling at a high rate of speed under a 500 ft. cloud circling.	2 Sec.	None
21 Jan 52	0950	*Mitchel AFB, New York	Navy TBM —	2 1/2 Min.	None
29 Jan 52	2300 and 2321	*Korea	A spherical object judged to be three feet in diameter.	5 Min. and 1 Min.	None
29 Jan 52	1830	Falls Church, Va.	Brilliant green fireball traveling in flat arc.	15-30 Sec.	None
10 Feb 52	Mid-day	Bandar Abbas, Iran	A shining object was observed passing over the city. A few minutes later, an explosion shook the city.	—	—
12 Feb 52	0145	Roswell, N. Mex.	Greenish-blue ball of fire was observed by a B-29 crew.	2 Sec.	None
26 Feb 52	2319	Korea	B-29 navigator reported a cylindrical-shaped object with some type of jet exhaust. (See Appendix IV)	15 Sec.	—

*Previously reported in Status Report #3.

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OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
	1 1/2 Min.	None	Same as F-84	2,500 ft. (Est.)	285°	F-84 Pilot	See Appendix I. Possibly a balloon.
traveling at a high rate of speed under	2 Sec.	None	High	Below 500 ft.	—	Four airmen	Conclusions pending.
	2 1/2 Min.	None	300-500 Knots	Up to 6,000 ft.	Varied	Navy Pilot	See Appendix II. Possibly a balloon.
in diameter.	5 Min. and 1 Min.	None	Same as B-29	Same as B-29	Same as B-29	Members of B -29 crews.	See Appendix III.
area.	15-30 Sec.	None	—	45° to 20°	225°	AF Colonel	Green fireball phenomena. No conclusions.
the city. A few minutes later, an	—	—	—	—	270°	Several Iranian Citizens	Possibly a meteor. Data was incomplete.
B-29 crew.	2 Sec.	None	—	Above	135°	B-29 crew members	Green fireball phenomena. No conclusions.
collided with some type of jet	15 Sec.	—	Higher than B-29	Same as B-29	30°	B-29 Navigator	See Appendix IV.

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APPENDIX I

Columbus, Ohio - 22 December 1951

I. DESCRIPTION OF INCIDENT

On 22 December 1951 at 1030 EST, the pilot of an F-84 aircraft observed an unidentified object five miles east of Columbus, Ohio. The F-84 was flying at 15,000 ft. altitude on a heading of 270°. The object was first sighted at two o'clock high. It appeared to be rolling on its longitudinal axis and the shape resembled an aircraft with no tail surfaces. It was on a heading of about 90°.

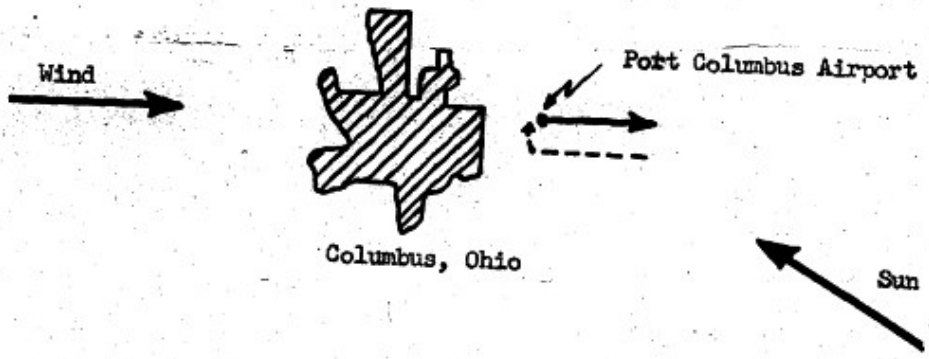
The pilot observed the object for one and one half minutes during which he made a right turn in an attempt to intercept and identify the object. It was lost when the pilot turned into the sun to follow the object.

II. STATUS OF INVESTIGATION

The pilot of the F-84 was interrogated by project personnel. No new facts were brought out. It was established, however, that the pilot could have observed a balloon launched from Port Columbus Airport at about 1000 EST. The wind was 30 knots from 270° which would place the balloon in the general area of the sighting. The pilot could not pinpoint his location other than "about five miles east of Columbus".

III. CONCLUSIONS

The F-84 possibly sighted a weather balloon launched from Port Columbus Airport. The reported actions of and shape of the object cannot be attributed to a balloon, however, previous reports have indicated that a balloon can be very deceptive when viewed from a high speed aircraft.



Balloon Path

Estimated Aircraft Path

T52-5836

APPENDIX II

Mitchel AFB, New York - 21 January 1952

I. DESCRIPTION OF INCIDENT

At approximately 0950 EST on 21 January 1952, a U.S. Navy pilot flying a TBM aircraft sighted an unidentified object southeast of Mitchel AFB. The TBM was on a heading at approximately 45°. When first noticed, the object was low at an angle of about 45° from the aircraft. The location of the aircraft was about three runways lengths from the end of, and lined up with, Runway #30 (300°). The object appeared to be halfway between the aircraft and the end of the runway. The pilot's first impression was that the object was a parachute and he thinks he noticed wedge or pie-shaped segregations on the top, however, he realized that the object was going cross-wind and that it could not be a drifting parachute. He judged the angular size to be the same as the angle subtended by a house on the ground and by watching the object cover the equivalent of a city block. He judged the speed to be 300 knots. He judged the altitude to be 200-300 feet. It appeared to be on a course of about 225°.

The pilot started a left turn (see overlay) in an attempt to identify the object. He states that he kept the airspeed of the TBM at about 160 knots and kept a nearly constant altitude of 6000 ft. all during the turn. He estimated that he was pulling from two to three G's in the turn. At one point near position #3 of the aircraft (see overlay) he had to increase his angle of bank to nearly 90° to keep the object from disappearing under the wing of the aircraft.

The pilot's version of the attempted interception is shown on the inclosed overlay. He stated that the paths shown are not exact due to the fact that he was concentrating on the object and not his position, although he occasionally looked at the airfield to get reference points.

The object stayed below the TBM during most of the time it was in sight. When the aircraft was somewhere near position 4, the object appeared to start a rapid climb, accelerating to an estimated 500 knots, and when it was at an angle of about 10° above the pilot's horizontal line of vision, it disappeared. When the object disappeared, the TBM was near position #5. The object did not diminish in apparent size except possibly near the end of the chase, it just disappeared. The pilot was very positive in his statement that when he was north of Mitchel AFB he could see the object. The course on which the object disappeared was established by lining up the aircraft with the apparent path of object and reading the compass.

The object appeared to be dome-shaped, or similar to the vertical cross-section of a parachute canopy. The top was light colored, "like nylon", and the under-surface was dark. It had a length to depth ratio of about 1:3.

While the object was in level flight it appeared to oscillate with a slow period.

The total time elapsed was estimated to be about two and one half minutes.

II. STATUS OF INVESTIGATION

A field trip was made to Mitchel AFB to reinterrogate the pilot and other personnel having knowledge of facts pertaining to the sighting. The pilot's description of the incident was the same as was stated in his original report. His added details have been incorporated into Section I of this Appendix.

At 0950 EST on 21 January 1952, the weather section of Michel AFB launched a Rawinsonde balloon from the position shown on the overlay. These balloons are about six feet in diameter at time of launch and expand on ascending. The expansion up to 6,000 ft. can be neglected, however, as it is small. The balloons are a light gray color and have white streaks of talcum powder which is used in packing the balloons. The balloon carried a tin-foil radar 18 inch square reflector six inches below the balloon. The path of the balloon is shown on the inclosed overlay.

These balloons are tracked by radar. It was hoped that the radar operators might have recalled seeing an aircraft return circling their balloon return. They stated, however, that due to the heavy air traffic in the area, it was not uncommon to pick up aircraft returns and they did not pay any attention to them.

The tower operators on duty at the time of the sighting were interrogated. They had not seen the TBM or the balloon. The tower log showed that the first contact with the TBM was at 0955 EST at which time pilot reported sighting an object east of the field. At 1008 the pilot again called the tower to describe the incident in detail. The pilot's description was a condensed version of that given in Part I of this Appendix except he stated that the object "appeared to be a parachute canopy with a dark colored object underneath". The 0955 contact was made soon after the object was sighted, establishing the time.

III. DISCUSSION OF INCIDENT

An accurate time of the initial sighting is needed to establish the position of the balloon at this time. It is assumed that the tower clock is more accurate than the clock in the TBM, thus the time of the initial sighting was probably closer to 0954 allowing for time to contact the tower than the 0950 which was estimated by the pilot.

At 0954 the balloon would have been at about 4,000 ft. and in the position marked 4,000 ft. on the overlay. The pilot stated that the object appeared low, at an angle of 45° from vertical, and appeared to cover the

same angle of vision as a house. This would make the slant range to the ground 8,500 ft. It can be shown that an object thought to be 30 ft. in diameter (assuming an average home is 30 ft. long) at 8,500 ft. range could also have been a six ft. diameter balloon only 1,700 ft. from the observer or at about 4,800 ft. altitude. Allowing for errors in estimation of the angle, this coincides very closely to the altitude of the balloon at 0954. The position of the balloon in respect to the ground was approximately off the end of Runway #30.

The pilot stated that the object appeared to be on a heading of 225°, the reciprocal of the heading of the TBM, and the speed of the object was about 200 knots. The balloon would appear to be traveling on a reciprocal heading and appear to be traveling at a higher rate of speed than the TBM if the pilot had assumed the balloon to be a large object close to the ground.

In examining the turn as sketched by the pilot (see overlay), it is believed that the radius of turn is too great. He stated that the air speed was kept at 160 knots and he estimated he pulled two to three G's, this would give a radius of turn of about 1,500 ft. instead of the nearly 6,000 ft. radius shown on the overlay. It will also be noted that in positions 0, 1, 2, and 3 on the overlay, the bearing of the object is relatively constant, being of about 10 o'clock from the aircraft heading. A balloon seen from an aircraft making a 360° left turn around the balloon would have a constant bearing at 9 o'clock, however, errors in the sketch of the ground tracks could account for this discrepancy.

After the position of the aircraft given as point 3 on the overlay, it is more difficult to show that the object could have been the balloon. If point 4 (of aircraft) is shifted to near point 1 (aircraft) it is possible that the pilot started another 360° turn around the balloon (see overlay).

Two major discrepancies in the theory that the object was a balloon are that the pilot was very sure that at one time during the attempt to intercept the balloon he was north or northwest of the airfield and could still see the object. In addition, shortly before the object disappeared, the line of sight of the object began to swing toward the nose of the aircraft. If this were true and the object was a balloon, the pilot should have been able to come close enough to the object to identify it as a balloon.

It should be noted that the pilot admits that the sketch could be in error. During the reinterrogation, it was brought out by the Operation's Officer at Mitchel AFB, who conducted the original interrogation, that the first sketch the pilot drew was about half the size (i.e. all radii one half) of the final sketch which has been copied in the inclosed overlay. This is further brought out by the calculations for the radius of turn. The pilot was positive that the airspeed was always 160 knots and that he was pulling about two to three G's. As stated before, this would give a radius of turn of about 1,500 ft. instead of the 6,000 ft. as shown on the overlay. A 6,000 ft. radius turn is not considered likely during any interception tactics in an aircraft as slow as a TBM. Changing the radius of the 360° turn to 1,500 ft. would "shrink" the complete sketch to one-fourth the original size (see overlay).

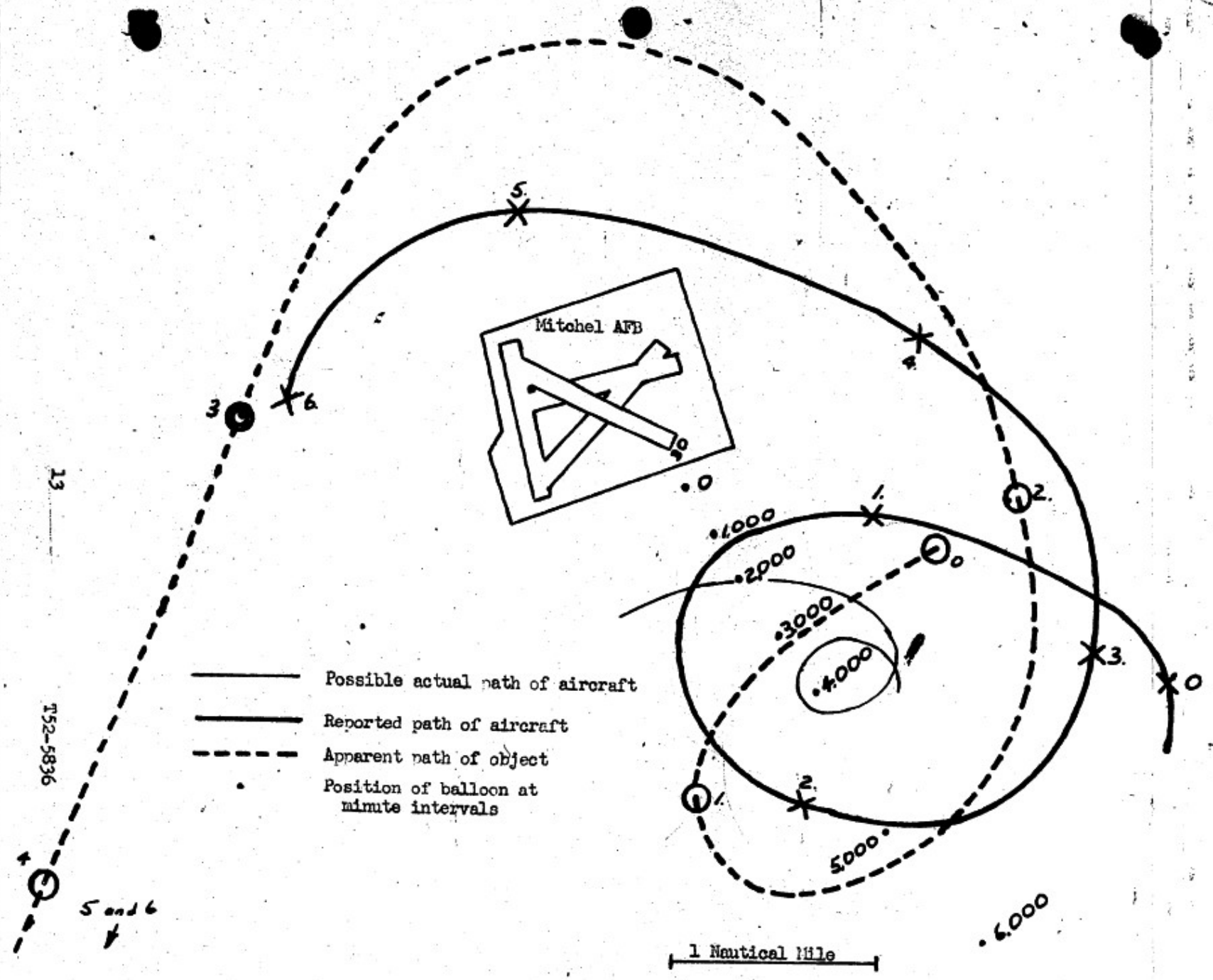
The time to turn, with a 1,500 ft. radius, is 35 seconds. Assuming the turn was not a perfect circle but more of an ellipse, the time would increase to possibly 45 seconds. This is also a discrepancy since the pilot judged the elapsed time to be two and one half minutes. This is not a serious discrepancy, however, as it is known that short intervals are difficult to judge and the pilot did not actually time his maneuvers.

The description of the object could very well be that of a balloon. Observations have shown that a balloon appears to be more oval or dome-shaped than spherical and due to shadows, the bottom appears darker than the top. The talcum powder used in packing the balloon could easily give the appearance of segments such as the panels in a parachute. The oscillations of the object described by the pilot are very similar in period to those of a balloon. The pilot stated that he did not observe anything suspended from the object such as the radar reflector handing beneath the balloon, however, the tower operator was sure that the pilot had mentioned the fact that there was something dark beneath the object when he called the tower to describe the object he had seen.

A T-11 was the only aircraft in the area near the time of the sighting. The possibility of the pilot's first seeing the balloon then the T-11 were checked but the T-11 was on an entirely different heading than that of the object, and was out of the immediate area.

IV. CONCLUSIONS

From the data obtained on this sighting, it cannot be definitely concluded that the object sighted by the TBM pilot was the Rawinsonde balloon released by the Mitchel AFB Weather Station. However, enough of the data on the reported object does correlate with that of the balloon to indicate that there is a possibility that the object observed was a balloon. There were no other reports of persons observing any unusual objects and since the object appeared to be 20 ft. to 30 ft. in diameter and very unusual in appearance at only 200 ft. to 300 ft. altitude over a thickly populated area, it would seem very likely that it would have been seen and reported by someone on the ground.


Mitchel AFB
Possible actual path of aircraft
Reported path of aircraft
Apparent path of object
Position of balloon at minute intervals
1 Nautical Mile
1000
2000
3000
4000
5000
6000

T52-5836

APPENDIX III

Korea - 29 January 1952

I. DESCRIPTION OF INCIDENT

On the night of 29 January 1952, 30 miles WSW of Wonson, Korea, three members of a B-29 crew, the tail, left, and top gunner, observed a light orange colored sphere for a period of five minutes. The object was on a parallel course to the B-29 at 8 o'clock level. The color of the object was further described as being the color of the sun with an occasional bluish tint. The outer edge of the object appeared to be fuzzy and it seemed to have an internal churning movement like flames or fiery gases. The object closed in on the B-29 to an undetermined distance, and then faded away in the distance.

The aircraft was on a heading of 274°, was at 22,500 ft. altitude and was making a ground speed of 148 knots. The time of the sighting was 2300 local Korean time. The weather was CAVU.

At 2324 local Korean time, members of another B-29 crew observed an identical object near Sunchon. This object was observed for one minute. The observers were the left and tail gunners. In this instance, the B-29 was at 22,250 ft.

The sources of these reports are all World War II veterans and veterans of previous combat missions in Korea. The crews were from different squadrons and were interrogated separately.

II. DISCUSSION OF THE INCIDENT

The times that the object or objects followed the B-29's indicate that the objects were propelled by some means, which eliminates the possibility of an unguided ground-to-air missile, drop missiles, etc. The color and shape of the flame were studied by members of the ATIC Propulsion Group to determine whether or not the flame could have been the exhaust of a conventional jet engine with or without an afterburner, a pulse-jet, ram-jet, or rocket engine. None of these possibilities were considered to be applicable.

The report is somewhat similar to the reports of "fireball-fighters", a type of phenomena observed in Europe during World War II. The exact nature of this phenomena was never determined but bomber crews reported large fiery balls, similar to the sun, passing through or near their formations. There is no documented evidence or data available on this phenomena, and all the information that has been obtained is verbal from World War II bomber crewmen, consequently, few actual facts are available.

III. CONCLUSIONS

No conclusions have been reached as to the identity or origin of these unidentified aerial objects. One possibility is that this may have been some type of flare towed by an aircraft to mark the B-29 for flak crews. No aircraft exhaust flame was reported, however.

APPENDIX IV

Korea - 24 February 1952

I. DESCRIPTION OF INCIDENT

On the night of 24 February 1952, at 2315 local Korean time, the navigator of a B-29 observed an unidentified aerial object. The B-29 was picked up by searchlights and about 45 seconds later the navigator sighted an object approaching from 7 o'clock. The object was estimated to be over Antung at this time. The object appeared to be cylindrical in shape and had a rapidly pulsating gaseous type of exhaust trail. The exhaust trail was approximately three times the length of the object with both the tail blast and the object bluish in color.

When first observed the object appeared to be climbing at 45°, however, it leveled off approximately 4,000 ft. from the B-29 and turned toward the B-29 as if taking up an interception course. The object continued to close on the B-29 at high velocity for approximately 15 seconds after which time it broke off level flight and headed down, passing under the B-29 at a gradual angle. As the object began to descend the flame diminished in size and got brighter. The navigator estimated that the object came within 3000 ft. of the aircraft and "it appeared to be the size of an automobile". (Assumed to mean the same size as an automobile viewed from 3,000 ft.)

The B-29 was flying at 22,000 ft. altitude and at a speed of 200 knots.

The searchlights stayed with the aircraft for approximately four minutes and weak inaccurate flak was encountered during the entire incident.

Weak electronic signals were picked up by the electronic countermeasures operator for a short time.

II. STATUS OF INVESTIGATION

More details on the sighting have been requested from FEAF. Since the object resembles a surface-to-air guided missile, the incident has been referred to the ATIC guided missiles group.

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SECURITY INFORMATION

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STATUS REPORT

PROJECT BLUE BOOK - REPORT NO. 5

FORMERLY PROJECT GRUDGE

PROJECT NO. 10073

31 MARCH 1952

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AUTH: CO, ATIC
BY: E.J. RUPPELT
1st Lt, USAF
DATE 9 Apr 52

This report is the fifth of a series of monthly status reports of Project Blue Book. Each report is written on or near the last day of the month and will contain a list of all incidents reported during the month covered by the report. The reports that are considered outstanding will be summarized in the appendices of the report so that more details can be presented. The overall status of the project will be presented.

Any additional information may be obtained on any incident by directing requests to Chief, Air Technical Intelligence Center, Attn: ATIAA-2c, Wright-Patterson Air Force Base, Dayton, Ohio.

The security classification of this report is Secret due only to the inclosure of reports that were classified Secret by the originating agency and due to the fact that allied information pertaining to the project is Secret. The classification of each separate incident is noted with the incident.

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STATUS OF PROJECT BLUE BOOK

I. OVERALL STATUS

A. Change of Project Nickname

The nickname of the project, which was formerly "Grudge", has been officially changed to "Blue Book".

B. Directive for Reporting Incidents

A proposed directive to replace the AFOIN-C/CC-2 directive dated 19 December 1951, subject, "Reporting of Information on Unconventional Aircraft", has been coordinated with ATIC and forwarded to D/I for approval.

This directive is similar to the directive of 19 December 1951 except it will require that all reports be made by wire to ATIC, ADC, and V/TC and that these wire reports be followed up by an Air Force Form 112 sent directly to ATIC and V/TC. Past experience has shown that in order to carry our investigations successfully ATIC must be informed of sightings immediately, by direct channels.

C. Holloman Report

Project Blue Book has recently received a copy of a report written by personnel of Holloman AFB, New Mexico. This report, dated 25 July 1951, compiles the results of an investigation of unidentified aerial phenomena carried out at Holloman AFB.

The project consisted of an organized watch for the objects, the watchers being equipped with cameras. Several photos were obtained with hand held cameras. The photos show only a round image with no details for identification. On two occasions objects were photographed with Askania theodolites, once on 27 April 1950 and again on 29 May 1950. The results were not satisfactory, however, and no data could be obtained because in the first instance only one station was tracking and in the second instance two stations tracked two different objects.

The report makes no conclusions as to the identity of the objects. However, it does establish the fact that some type of object did exist.

Action will be taken by Project Blue Book to establish liaison with Holloman AFB and determine if any additional results have been obtained.

D. Life Article on Unidentified Aerial Objects

Mr. Robert Ginna of the Life Magazine Staff visited ATIC on 3 March 1952 to obtain material for an article which will appear in Life on 4 April 1952. He was very familiar with this subject as he has spent a great deal of time in research. The article has been coordinated with Hq USAF.

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One interesting aspect of the visit by Mr. Ginna was the fact that Life has information on several sightings by highly qualified observers that were unknown to ATIC. These people, all civilians, had not reported their observations to any military sources, consequently, ATIC did not have the reports. With the exception of these and several more minor reports, ATIC did have information on all of the incidents that he inquired about.

It is believed that Mr. Ginna's contact with the Air Force established an excellent source of material in that Life has representatives all over the world and these people are sending reports to Life as a matter of routine. ATIC will have access to these reports.

E. Visit by Dr. Joseph Kaplan

On 7 March 1952, Dr. Joseph Kaplan, Professor of Physics at UCLA and a member of the AF Scientific Advisory Board visited ATIC to discuss methods of obtaining more factual information on the reported unidentified aerial objects than has been obtained in the past. His primary interest is the "Green Fireball" phenomena, but the methods he suggested can be applied to any object.

Dr. Kaplan's suggestion is to use spectrum analysis as an aid in identifying the objects. Any object that emits light will have a definite spectrum. The first step in Dr. Kaplan's suggested plan is to obtain the spectrum of the object. This spectrum is then matched with the spectrum of known objects such as meteors, stars, etc., to eliminate or establish the fact that they are known objects. If the objects are not astronomical bodies and spectrum will give some indication as to what they might be. For example, a spectrum of an exhaust trail would show the composition of the exhaust. These examples apply to night sightings in general; however, bright objects appearing in the daytime could be analyzed in a similar manner. If the object were reflecting light instead of emitting it, the spectrum would be the same as that of the sun. Then it would be a case of establishing whether or not there was an aircraft in the area.

The system will afford a means of determining whether or not reported objects are actually some new type of aircraft or merely misidentification of known objects. This suggested system would not completely fulfill the requirements of the project, however, it is a quick, economical means of obtaining more concrete information than now exists and is considered a first step in the investigation.

To obtain the spectrums of the objects, two methods have been suggested. One is the use of a comparatively large (8" x 8") diffraction grating. The observer upon seeing an object would hold up the grating and observe the object through the grating. A means would be provided for marking the observed spectrum on the grating. This would then be sent to some expert for analysis. The second method, and the one under consideration would be to construct an inexpensive hand held camera with a diffraction grating over the lens. With this method a permanent record of the observation would be obtained.

The gratings or grating camera combinations would be inexpensive enough so that several hundred could be procured. Areas where observations have been concentrated would be stressed. Groups such as security patrols, control tower operators, and anyone who spends a great deal of time our-of-doors would be equipped with the instruments and be given a set of instructions as to how to use them.

Action has been taken to determine the feasibility of such a program.

F. Air Defense Command and Joint Air Defense Board Briefing

On 19 March 1952, General Chidlaw and his staff, of the Air Defense Command, and General Gardner and his staff, of the Joint Air Defense Board, were briefed by an ATIC briefing team. The groups were briefed on the history and operations of Project Blue Book and a member of the Aircraft Performance and Characteristics Branch of ATIC presented data on missiles and types of unconventional aircraft that are known to exist or have existed.

The purpose of the briefing was to present the problem to ADC and determine how they can help. It was found that ADC presently has about 30 radar sites equipped with scope cameras. These cameras are not operational on a 24-hour basis but this could be accomplished in a minimum time particularly in locations of special interest to Project Blue Book. Radar scope photographs would be of great value in interpreting some of the unusual radar returns that are reported.

Action has been taken to initiate a program with ADC to utilize their radar facilities.

G. Beacon Hill Group Briefing

The Beacon Hill Group, Air Force Technical Advisers, were briefed on 26 March 1952 in Boston. This group, consisting of AF consultants in the fields of electronics, optics, acoustics, data collation and other fields, was briefed so that they would have an understanding of the problems confronting Project Blue Book and could offer suggestions. After the briefing several hours were spent discussing the project. The main point of the discussion was to arrive at some means of establishing whether or not there is some unusual type of aircraft flying over the United States.

Several very excellent suggestions were offered. One was to employ sound detection apparatus in the locations where concentrations of sightings have been reported. This equipment, which is very sensitive to sound, can be left unattended eliminating the problem of personnel for a continual watch. Sounds from aircraft, wind, insects, etc., can be identified, consequently, if the apparatus were placed far enough from a populated area and highway to eliminate a large percentage of the sounds, any unknown sound would be of value in indicating the presence of an unidentified object. It is understood that this equipment is available.

The problem of photographic equipment was discussed. It was found that almost any type of photographic surveillance equipment desired could be built, however, some of it would be expensive. The question of the ability of large astronomical observatories detecting any unusual objects with any of their telescopes or meteor cameras was brought up. It was agreed that their chances of observing an object at random was low, unless they knew of its presence and directed their equipment toward it. This was very interesting because some people have had the theory that no unusual objects could exist because they would have been detected by observatories. In the future, cameras, professionally termed "patrol cameras", will be developed that can detect such objects, but this development is not contemplated in the near future.

Another suggestion offered by the group was to go back through old newspaper files and other sources and try to determine whether or not this phenomena is new. This has been done by several authors but the sources of some of these reports are doubtful. The group believed that if such phenomena as disk-shaped objects, green fireballs, etc., did occur they would have been reported and would be recorded.

This group, all of whom were experts in their fields, were very much interested in the problems of trying to identify these objects and can be counted upon for aid as problems arise.

II. REPORTS OF SPECIFIC INDICENTS

A. Inclosed Summary List of Incidents

The inclosed list of incidents is (1) a summary of all incidents reported during the period 1 March 1952 to 31 March 1952; and (2) those incidents reported in Status Report No. 4, dated 29 February 1952, which are still pending or have been closed during the month.

SIGHTINGS OF UNIDENTIFIED OBJ

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOL
May to Sept 1947	—	USSR	Dark red fireball, which turned to pale green to white. Observed from point 50 Km S.E. of Tashkent, USSR. (See Appendix I.) (Secret)	—	—
4 Jan 52	0500	Travis AFB, Calif.	Source observed bright green tear drop shaped object descending through a cloud cover. The object had a long trail of red flame which seemed to shoot out large colored sparks. (Restricted)	15-30 Sec.	None
20 Jan 52	1920	*Fairchild AFB, Wash.	Sources observed circular blue-white light with blue trail. The trail appeared to appear in "spurts". (See Appendix II). (Restricted)	2 Sec.	None
11 Feb 52	1210	Kansas City, Mo.	Source reported circular object near high flying B-36. (See Appendix III.) (Confidential)	10 Min.	—
11 Feb 52	0300	Pittsburgh, Pa.	Two pilots of T-11 aircraft observed a brilliant yellow-orange light, trailing a pulsating flame, flying on a reciprocal heading. (Secret)	1 Min.	—
12 Feb 52	2030	Washington, D.C. Area	Two pilots observed white light on two occasions one half hour apart. (See Appendix IV.) (Restricted)	2 Min.	—
13 Feb 52	1545 Z	31° 45'N 159° 10'E	MATS crew observed unidentified aircraft flying parallel to their a/c. Aircraft then turned across their flight path. Possibilities of friendly a/c in the area was doubtful. (Secret)	5 Min.	—
25 Feb 52	1100	El Paso, Texas	Source allegedly obtained photos of two unidentified objects while photographing a rainbow. (See Appendix V.) (Restricted)	—	—
27 Feb 52	2230	Between Ft. Stockton and Pecos, Texas	Radar operator of B-29 flying at 15,500 ft. picked up unidentified object on the radar scope. Rate of closure was three times that of B-29. (Confidential)	—	—
4 Mar 52	0351	England	B-29 left gunner noted extremely bright flash in sky behind a/c which was flying at 17,500 ft. (Secret)	—	—
7 Mar 52	0100	Between Tulsa and Claremore, Oklahoma	Bright white light noted crossing 90° to path of C-54. Object appeared to be another aircraft except no navigation lights were noted. Object descended and light went out. (Restricted)	—	—
12 Mar 52	1815	Columbus, Ohio	Long, shiny, apparently wingless object with a pinkish-red flame to the rear. (Restricted)	Unknown	None
13 Mar 52	0722 Z	Iceland	Unidentified return on GCA scope. (Secret)	57 Min.	—

* Previously reported in Status Report No. 4

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CONFIDENTIAL

ATIC FORM NO. 328
(27 DEC 51)

...IDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
...o. Observed from point 50 Ms	—	—	—	—	SSE	—	See Appendix I.
...descending through a cloud cover. ...to shoot out large colored	15-30 Sec.	None	Same as jet a/c	Low	90°	Airman	Description resembled large meteor.
...trail. The trail appeared to	2 Sec.	None	High	Low	—	Two Airmen	See Appendix II
...6. (See Appendix III.)	10 Min.	—	Low	High	180°	Civilian	Probably a balloon. See Appendix III.
...-orange light, trailing a ...s)	1 Min.	—	Same as jet	High	180°	Two AF pilots	Description similar to meteor.
...half hour apart. (See Appendix	2 Min.	—	Varied	8,000 ft.	Varied	Two AF pilots	See Appendix IV.
...then	5 Min.	—	200 MPH	9,500 ft.	120° to 360°	MATS C-54 crew	Unidentified conventional aircraft.
...objects while photographing	—	—	—	—	—	AF Captain	Objects on photographic print due to flaws in negative. See Appendix V.
...unidentified object on the ...B-29. (Confidential)	—	—	3 x B-29	Lower than 15,500 ft.	—	B-29 Radar Operator	Conclusions pending. Radar scope photos have been requested.
...behind a/c which was flying	—	—	—	—	—	B-29 Crewman	None - information too nebulous.
...Object appeared to be another ...ject descended and light went	—	—	Moderate	10,000 ft.	360°	RAF Wing Commander	Possibly aircraft with no navigation lights. No further investigation.
...sh-red flame to the rear.	Unknown	None	30,000 ft.	High	135°	Newspaper Reporter	Object was identified as a B-45 aircraft. The setting sun caused the vapor trail to appear reddish.
	57 Min.	—	250 K	8,000 ft.	Varied	OCA Crew	Possibly Soviet recon (evaluation by ADC).

APPENDIX I

Tashkent, USSR - May to September 1947

I. DESCRIPTION OF INCIDENT

During a period from May to September of 1947, a source observed three light phenomena almost every night between the hours of 2100 and 2200 and 2200 local time. The phenomena which occurred at 15 minute intervals were seen SSE of Pakhta Aral, which is about 31 miles SW of Tashkent, USSR (41° 18' N - 69° 15' E).

The phenomena first appeared as a large dark red ball of fire. After about six seconds it reached the apex of a long trajectory, during which time it developed a trail of fire. As the ball of fire descended from the apex of the trajectory, it changed from red to pale green, to white. Smoke trails, noises, or detonations were not heard nor seen. At the apex of the trajectory and object seemed to be about one-fifth the diameter of a full moon.

II. STATUS OF INVESTIGATION

No further investigation or interrogation is possible. Report is evaluated as F-3. This report was submitted to Project Blue Book because of the green color which might possibly relate to "Green Fireballs".

III. CONCLUSIONS

No conclusions can be made due to the nebulous nature of the information. This report was submitted to the Fuels Group and Guided Missiles Group of ATIC. Both agreed that the object was not a liquid fuel missile, however, it could have been a smaller solid fuel rocket.

APPENDIX II

Fairchild AFB, Washington - 20 January 1952

I. DESCRIPTION OF INCIDENT

At approximately 1920 MST on 20 January 1952, two Wing Intelligence airmen noticed a bright spherical object traveling through the sky. At first it was assumed to be a meteor but then it was noted that it appeared to be traveling beneath a cloud layer. The object was traveling at a speed much faster than a jet aircraft. The object, which made no sound, was traveling in a path horizontal to the earth at an estimated 500 feet and left a blue trail. The trail seemed to come from the object in spurts. The object disappeared from sight behind a building.

The two airmen observers, a Tech Sergeant and Master Sergeant are considered reliable observers.

II. STATUS OF INVESTIGATION

This incident is interesting due to the fact that there was an eight-tenths cloud coverage at 4,700 ft. It is possible that the object was viewed between a break in the clouds and that it was extremely high, indicating that the sighting was a meteor. However, the sources indicated that they believed the object was below the cloud cover, and if this is true the slant range of the object can be computed to be about 7,300 ft. This would eliminate the possibility of the lighted object being a conventional aircraft, since no sound was heard. The possibility of a meteor is also nil because a meteor would not be traveling horizontally at 7,300 ft.

A request was made for the angular measurement of the arc made by the object, however, this information could not be obtained. It is presumed that the sources were not available for questioning.

III. CONCLUSIONS

If the object was beneath the cloud cover it was not a conventional aircraft or meteor, and no conclusions can be made as to its identity.

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APPENDIX III

Kansas City, Missouri - 11 February 1952

I. DESCRIPTION OF INCIDENT

On 11 February 1952, between 1205 and 1215 CST the source, a civilian woman, was watching a B-36 fly from East to West over Kansas City. While watching the B-36, she noticed a round bright object just north of the vapor trail left by the aircraft. The object was observed for ten minutes through 6 x 30 binoculars and during this period it drifted over the observer and continued south of Kansas City.

II. STATUS OF INVESTIGATION

Two balloons were launched in the general area prior to the time of sighting. A piball balloon was launched from Fort Leavonworth, Kansas, at 0930 CST and a Rawinsonde balloon was launched from Fairfax Airport, Kansas City, at 1130 CST. It is doubtful if the balloon launched at 0930 would be in the area at 1205 CST as they usually burst within an hour after the launching.

The balloon launched at 1130 CST could have been observed, however. In the 35 minutes between the time of the balloon launch and the observation, the balloon would have ascended to approximately 30,000 feet and would have traveled approximately 15 miles. (The wind was from 315° and averaged about 30 knots.) This would mean that the balloon passed near the source. If some allowance is made for an error in time, it is very possible that the balloon could have passed directly over the observer. (See inclosed overlay.)

The fact that it could be observed at 30,000 ft. is probably due to the fact that the sun caused the balloon to glow.

III. CONCLUSIONS

The object observed by the source was very possibly a Rawinsonde balloon launched from Fairfax Airport.

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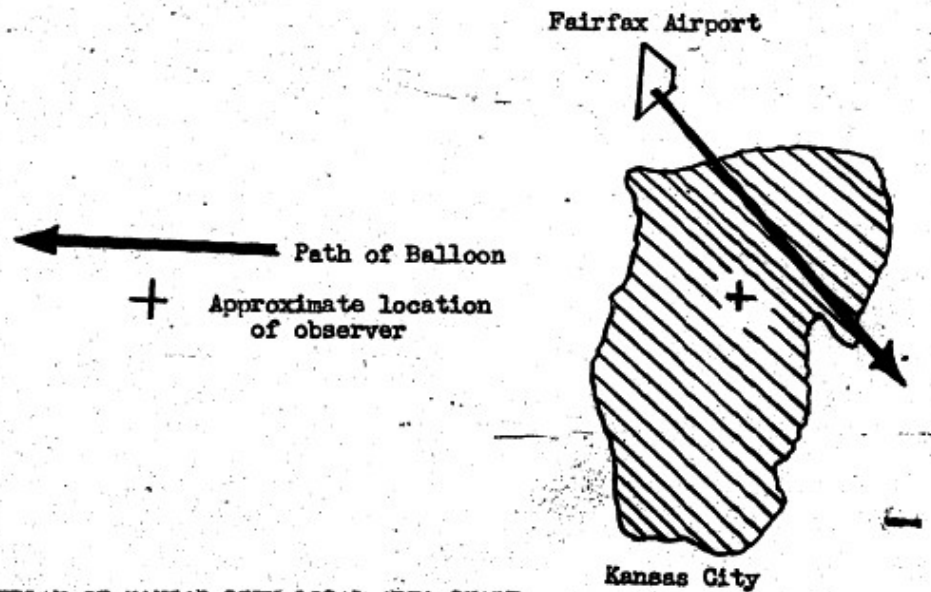
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Sherman AFB



Ft. Leavonworth, Kansas



OVERLAY OF KANSAS CITY LOCAL AREA CHART

T53-6888

APPENDIX IV

Washington, D. C. Area - 12 February 1952

I. DESCRIPTION OF INCIDENT

On 12 February 1952, two MATS pilots flying a C-47 on a local flight observed a bright white object which appeared to be at 7,500 ft. to 8,500 ft. and about one-sixth the size of a rising moon.

The object was observed twice. The first time at 2030 EST, the C-47 was between Baltimore and Baltimore Friendship Airport. The object was estimated to be eight to ten miles away traveling slowly for a moment but then accelerated very rapidly and disappeared southwest of Washington, D. C.

The second time the object was observed was at about 2100 EST, the C-47 was about ten miles south of Baltimore at the time. The object appeared to approach Washington from the south and east, making a left turn toward the city. When it was within two or three miles ESE of Washington, it appeared to hover for about one minute and then it disappeared.

In both instances the object was observed for two or three minutes.

II. STATUS OF INVESTIGATION

The description of this incident is very similar to the one reported on 28 December 1951 that proved to be a helicopter carrying experimental lighting. However, checks on local traffic did not reveal a helicopter in the area on this date.

III. CONCLUSIONS

None.

APPENDIX V

El Paso, Texas UNCLASSIFIED 25 February 1952

I. DISCUSSION OF INCIDENT

This report contained a photograph of two very unusual objects. The source, an AF Captain, stated that he was attempting to photograph "a circle" that he observed near a rainbow. The "circle" disappeared but he took a picture anyway. Upon developing, or having the negatives developed, two circular objects, similar in appearance to the planet, Saturn, were noticed.

II. STATUS OF INVESTIGATION

Examination of the negative under a microscope showed that the images on the print were caused by two damaged spots on the negative. The cause of these damaged spots is unknown but it appeared that the emulsion had been heated or burned as it was brownish in color. The spots could also have been due to something touching the emulsion while it was still in a gelatin state.

III. CONCLUSIONS

The images on the print were due to damaged spots on the negative.

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STATUS REPORT

PROJECT BLUE BOOK - REPORT NO. 6

FORMERLY PROJECT GRUDGE

PROJECT NO. 10073

30 APRIL 1952

AIR TECHNICAL INTELLIGENCE CENTER
WRIGHT-PATTERSON AIR FORCE BASE
DAYTON, OHIO

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1. Information conflicting with or pertinently affecting that contained in this publication should be forwarded by the recipient directly to:

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AUTH: CO, ATIC
BY: E.J. RUPPELT ESR
1st Lt, USAF
DATE 19 May 52

This report is the sixth of a series of monthly status reports of Project Blue Book. Each report is written on or near the last day of the month and will contain a list of all incidents reported during the month covered by the report. The reports that are considered outstanding will be summarized in the appendices of the report so that more details can be presented. The overall status of the project will be presented.

Any additional information may be obtained on any incident by directing requests to Chief, Air Technical Intelligence Center, Attn: ATIAA-2c, Wright-Patterson Air Force Base, Ohio.

The security classification of this report is Secret due only to the inclosure of reports that were classified Secret by the originating agency and due to the fact that allied information pertaining to the project is Secret. The classification of each separate incident is noted with the incident.

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STATUS OF PROJECT BLUE BOOK

I. OVERALL STATUS

A. Briefing of the "Civilian Saucer Investigations"

On the evening of 2 April 1952, a civilian group who are interested in the investigation of reports of unidentified aerial objects was briefed on all of the unclassified aspects of the project. This group consists of employees of the North American Aircraft, Inc., Aerophysics Laboratory, and several non-technical persons. The organization is not, however, officially affiliated with the aircraft company. The majority of this group are qualified engineers and are working on missile developments.

The purpose of the briefing was to familiarize this group with the past history and present operations of the project. It is believed that these people will possibly receive reports of unidentified aerial objects from civilian sources that might not be reported to the Air Force. They are also in contact with other civilian groups in the United States that are collecting similar reports.

Although this group is financially unable to conduct any large-scale investigations, liaison has been established so that the Air Force will be advised of any outstanding reports they receive.

B. Visit to [redacted]

A group of Rand, Inc., personnel were briefed on 4 April 1952. Although Rand, Inc., is not associated with the project in any way, some of the scientists are personally interested and have been following the status of the project. After the briefing, various aspects of the project were discussed, among them the use of a diffraction grating camera to obtain the spectrum of objects that may be observed. All of the group concurred that this would be an inexpensive method of obtaining more definite data.

The status of the Rand study on the satellite rocket was also discussed.

C. Status of Diffraction Grating Camera

The status of the proposed diffraction grating camera was discussed with Dr. J. Kaplan of UCLA on 2 April 1952. Dr. Kaplan used a laboratory set-up to demonstrate how the grating will function. Suitable gratings have been found and it is believed that they can be reproduced for from $15 to $20 each. Although these gratings are not of high quality, they will be good enough to give the results that are hoped for. Tests are now being conducted to determine how inexpensive a lens can be used to give the light gathering power and definition needed to obtain a satisfactory photograph. The intensity of the full moon is being used as "the standard brilliance" for the tests.

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"Suggestions have been made for incorporating devices into the camera so that the azimuth, elevation and possibly the temperature of the source can be measured. The primary factors in determining whether or not these extra devices can be included are the cost and the fact that they will complicate the operation and maintenance of the cameras.

D. Visit of Look Magazine Reporter

On 25-26 April 1952, a representative of Look Magazine visited ATIC to obtain material for a forthcoming magazine article.

E. Status of Utilization of Radar Scope Cameras

On 21 April 1952, a letter was forwarded to Air Defense Command requesting the location of all ADC radar sites that have operational radar scope cameras and those sites that have cameras but do not yet have them operational. When this information is received, a request will be made to put all or part of these cameras on a 24-hour alert basis.

Although this will not provide definite identification of radar returns, it will aid in determining whether or not the return is due to weather phenomena, a malfunction of the set or a return from some unidentified object. A photograph of the exact size and shape of the return will then be available for study and the impression of the operator need not be relied upon.

F. Contractor Status

The contractual agreements with [redacted] for furnishing aid in conducting this project have been finalized. At the present time these people are formulating a standard questionnaire which will contain all data pertinent to a sighting. There have been several such questionnaires used in the past. The good points of each will be combined to give a new, more complete system of obtaining information.

G. Reaction to Life Magazine Article

On 4 April 1952, Life Magazine published an extensive article entitled, "Have We Visitors From Space?" This article created a great deal of interest in the subject of unidentified aerial objects. During the period of 3 April to 6 April 1952, approximately 350 daily newspapers in all parts of the United States carried some mention of the article and some mention of the fact that the Air Force was interested in receiving such reports.

It should be noted here that the conclusions reached by Life are not those of the Air Force. No proof exists that these objects are from outer space.

ATIC received approximately 110 letters in regard to the article. The letters are divided among those that offer theories as to the origin of the objects as well as those reporting objects. The letters offering theories comprise about 20 percent of the total. Although it cannot be stated that the theories are incorrect, a majority of them cannot be further evaluated since they have very little scientific basis. The letters which reported sightings comprised about 80 percent of the total. All but a few of these letters reported sighting that occurred within the last two years. The writers of these letters ranged from mystics to highly educated individuals.

All letters have been acknowledged.

It has been reported that Life Magazine has received 700 letters in response to the article.

II. REPORTS OF SPECIFIC INCIDENTS

A. Inclosed Summary List of Incidents

The inclosed list of incidents is (1) a summary of all incidents reported during the period 1 April 1952 to 30 April 1952; and (2) those incidents reported in Status Report No. 5, dated 31 March 1952, which are still pending or have been closed during the month.

S[illegible]INGS OF UNIDENTIFIED OBJECTS

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALT
6 Jan 52	1652	Palmer, Alaska	Sources observed long tube-like, bright blue object, near the setting sun. During the observation the object shifted fr[illegible] a horizontal to a vertical position. (Confidential)	30 Min.	—	Slow	
16 Jan 52	—	Artesia, N. Mex.	Two objects observed near "Skyhook" ba[illegible]hon. (Confidential) (See Appendix I)	40 Sec.	—	High	
17 Jan 52	0100	Long Island, N.Y.	Source observed light traveling throug[illegible] sky. The light exploded in a green flash. (Unclassified)	5 Sec.	—	High	
22 Jan 52	1020Z	Nenana, Alaska	Radar return from both ground and airb[illegible]ne radar. Sightings were not simultaneous. (Secret) (See Appendix II)	Several Seconds	—	Varied	Va
9-11 Feb 52	—	Finland	Unexplained explosions or earth tremor[illegible] (Restricted)	—	—	—	
13 Feb 52	1545Z	Pacific Ocean 31°16'N 159°10'E	Sources observed what appeared to be l[illegible]hts of a conventional aircraft near their aircraft. Lights cut across their cou[illegible]e after flying parallel. No known aircraft in the vicinity. (Restricted)	5 Min.	—	200 MPH	9,
20 Feb 52	2330	Stockton, Calif.	Two aircraft pilots observed object de[illegible]ribed as "locomotive headlight" at same altitude as a/c. Object accelerated a[illegible] climbed after crossing path of a/c. Possibility of other aircraft in area [illegible] negative. No radar returns. (Secret)	—	—	—	
13 Feb 52	—	Granite City, Ill.	Radar Bomb Scoring Group observed unus[illegible]l radar returns while attempting to score bomb run. (Secret)	—	—	High - up to 1090 MPH	
23 Feb 52	0215Z 0225Z 0231Z	36°51'N - 8°50'W Mediterranean Area	MATS crew observed three bright white [illegible]ashes of light. Each successive flash was nearer the aircraft. (Confidential)	—	—	—	8,
26 Feb 52	1110	Albany, N. Y.	Two aircraft observed object flying ve[illegible] high and very fast. "Pencil-thin" vapor trail observed. (Restricted)	3-5 Min.	—	1,000 MPH (Est)	Ver
27 Feb 52	2230	*Between Ft. Stockton and Pecos, Texas	Radar operator of B-29 a/c picked up [illegible]dentified object. Object approached B-29 at three times B-29's speed. (Confid[illegible]tial)	—	—	3 x B-29	Lo[illegible]
22 or 29 Mar 52	—	Colmar Manor, Md.	Source reports observing formation of [illegible]hts arranged similar to letter "C". Objects oval in shape and grey in color. (Res[illegible]icted)	—	—	High	Hig
1 Mar 52	1544Z	Goose AFB, Lab.	Source observed high vapor trail. Che[illegible] showed no aircraft in area other than local flights at low altitude. (Secret)	—	—	—	Hig
20 Mar 52	1730	Clovis, N. Mex.	Source observed pear-shaped object the[illegible]lor of silver or burnished gold. Observed to hover until it disappeared due to d[illegible]rness. (Restricted)	1 Hr.	None	Hovered	—
25 Mar 52	0645	Pt. Conception, Calif.	B-29 radar observer and navigator obse[illegible]d unidentified return. (Restricted)	20-30 Sec.	—	3,000 K.	25,0
26 Mar 52	0605Z	Alaska	Unidentified radar returns of two a/c[illegible]ecret)	22 Min.	—	—	—

ATIC FORM NO. 328 (27 DEC 51)

*Previously reported in Status Report No. 5

INGS OF UNIDENTIFIED OBJECTS

#6

OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
bright ...ping object, near the setting sun. During ...ed fro... a horizontal to a vertical position.	30 Min.	—	Slow	—	—	Several civilians	Possibly some phenomena incident to setting sun.
...ject" ...oon. (Confidential) (See Appendix I).	40 Sec.	—	High	—	45°	Balloon Observers	No conclusions. See Appendix I.
...through ...sky. The light exploded in a green flash.	5 Sec.	—	High	—	90°	Civilian	Description somewhat resembles a meteor.
...and a... ...e radar. Sightings were not simultaneous.	Several Seconds	—	Varied	Varied	Varied	Radar Operators	Pending. See Appendix II.
...breaks ...(Restricted)	—	—	—	—	—	Civilians	Believed to be of seismological origin.
...be ...ts of a conventional aircraft near their ... ...area flying parallel to known aircraft	5 Min.	—	200 MPH	9,000 ft.	120° to 360°	MATS crew	Possibly conventional a/c.
... ...an Fluorescent Searchlight" at some ... ...ated after arriving ... of a/c. ... ...positions. No radar returns. (Secret)	—	—	—	9,000 ft. (Est.)	90°	AF Pilots	No conclusions. No investigation due to time lapse since report.
...usual radar returns while attempting to score	—	—	High - up to 1090 MPH	30,000 ft.	Varied	Radar crew	Pending
...white ...asses of light. Each successive flash was ...tical)	—	—	—	8,500 ft.	—	MATS crew	No conclusions. No investigation.
...ying ... high and very fast. "Pencil-thin" vapor	3-5 Min.	—	1,000 MPH (Est)	Very High	—	AF pilots	Possibly meteor.
...ed up ...dentified object. Object approached B-29 (Confidential)	—	—	3 x B-29	Lower than ...,000 ft.	—	B-29 Radar Observer	Return was probably due to interference of radar with some part of the B-29. Evaluation from radar scope photos.
...on of ...nts arranged similar to letter "C". Objects ...(Restricted)	—	—	High	High	—	Civilian	No conclusions. No investigation.
...Che... ...owed no aircraft in area other than local ...s).	—	—	—	High	45°	AF Pilot	No conclusions. Insufficient data.
...ct: ...ion of silver or burnished gold. Observed ... ...ions. (Restricted)	1 Hr.	None	Hovered	—	—	AF Flight Surgeon	Possibly balloon from White Sands.
...ob... ...unidentified return. (Restricted)	20-30 Sec.	—	3,000 K.	25,000 ft.	315°	AF Navigator and Radar Operator	Similar phenomena due to interference of parts of a/c.
...two a/c ...Secret)	22 Min.	—	—	—	—	Radar Observers	Very probably unidentified conventional a/c.

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SIGHTINGS OF UNIDENTIFIED OBJECTS

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	AL
15 Apr 52	1940	Santa Cruz, Calif.	Two very faint objects crossed horizon in six seconds. (Unclassified)	6 Sec.	—	600 mph up	15
16 Apr 52	2203 C	Dallas, Texas	Eight separate colored balls. (Restricted)	20 Min.	—	—	—
17 Apr 52	1600 Z	Sault Ste Marie, Michigan	Round, pink, stationary object at 5000-8000 ft. altitude and appearing equal in size to B-29. (Restricted)	—	—	—	50
17-18 Apr 52	1505-1510	Yuma, Ariz.	Flat, white object, circular and with an occasional vapor trail. (Restricted)	7 Sec.	—	—	80
20 Apr 52	2133 PST	McClellan AFB, Calif.	Seven to ten objects appearing to follow aircraft that landed at McClellan. (Confidential)	3-5 Sec.	—	—	Le 1,0
21 Apr 52	1030 PST	Walla Walla, Wash.	Eight disc-shaped objects sighted NW of Walla Walla. (Confidential)	—	—	500 mph	Hi
22 Apr 52	0120Z	Waskish, Minn.	Cigar shaped, wingless, aluminum reflecting surface and soundless going north. (Restricted)	1 Min.	—	30 miles Min.	10,
24 Apr 52	0500 EST	Bellevue Hill, Va.	Three objects in loose fingertip formation at high speed in distance. (Secret)	3-4 Min.	—	High	—
24 Apr 52	1430-1445	Milton, Mass.	Two flat, flexible, square-like objects and dark orange or red color traveled with a wobbly undulating motion for four to six miles in the time they were observed. Went out of sight naturally due to distance. (Confidential)	1 1/2-2 Min.	—	240 mph	2,
25 Apr 52	2115	Germany	Brilliant moving white light on collision course with aircraft. (Confidential)	2 Min.	—	High	2,
25 Apr 52	2100-2115	Fargo, N. D.	Objects that glowed were seen very high and in "V" formation. (Confidential)	4 Sec.	—	—	—
27 Apr 52	1508Z	Grand Rapids, Mich.	Very bright white object flying in arc at high speed and approximating in size a ping pong ball held at arm's length. (Secret)	17 Sec.	—	1,500 mph	40
29 Apr 52	—	Dayton, Ohio	Civilian employed at W-P AFB reported observing blue object with brilliant red center. (Confidential)	45 Min.	—	—	—
30 Apr 52	0740 & 0746	Moriarity, N.M.	Radar pick-up. (Confidential)	4 Sweeps & 6 Sweeps	—	3,700 mph	—
18 Feb 52	—	Granite City, Ill.	Radar Bomb Scoring Group observed unusual radar returns while attempting to score bomb run. (Secret)	—	—	High up to 1,090 mph	30,
8 Apr 52	2000	Duncanville, Tex.	Unidentified radar return. (Secret)	—	—	2052 K	—
12 Apr 52	2230	*North Bay, Ont.	One bright amber disc was reported to have come into view from the SW and moved across the RCAF airfield. It then stopped, reversed direction and disappeared. (Confidential)	—	—	High	—
1 May 52	1050 PDST	George AFB, Calif.	Five dull white, circular objects which appeared to almost collide with each other and then break apart. (Confidential)	30 Sec.	—	2 x jet a/c	5,
1 May 52	0532 PST	Hanford Area, Wash.	One silver object at fairly slow airspeed - patrol plane in air at same time. (Confidential)	1 1/2 Min.	—	Slow	5,

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SIGHTINGS OF UNIDENTIFIED OBJECTS

DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
horizon in six seconds. (Unclassified)	6 Sec.	—	600 mph up	1500-3000 ft.	NE	Civilian	No conclusion.
(Restricted)	20 Min.	—	—	—	—	Civilians	No conclusions. Very little data.
at 5000-8000 ft. altitude and appearing equal in size	—	—	—	5000-8000 ft.	—	Civilian	Balloon released at 1600. Source observed the object at the same bearing.
and with an occasional vapor trail. (Restricted)	7 Sec.	—	—	80°	—	Military	No conclusion.
to follow aircraft that landed at McClellan. (Confidential)	3-5 Sec.	—	—	Less than 1,000 ft.	NNE	Commercial Pilot	Insufficient and too vague data to draw conclusion.
NW of Walla Walla. (Confidential)	—	—	500 mph	High	E	Two Civilians	No conclusion.
reflecting surface and soundless going north.	1 Min.	—	30 miles Min.	10,000 ft.	N	Civilian	No conclusion.
at high speed in distance. (Secret)	3-4 Min.	—	High	—	—	C-124 Crew	No conclusions.
red color traveled with miles in the time they were observed. (Confidential)	1 1/2-2 Min.	—	240 mph	2,000 ft.	NE	Civilian Research Tech.	No conclusions.
collision course with aircraft. (Confidential)	2 Min.	—	High	2,000 ft.	NW	AF Pilots	Possibly unknown convectional a/c.
very high and in "V" formation. (Confidential)	4 Sec.	—	—	—	N	Many	See Appendix I.
in and at high speed and approximating in size a length. (Secret)	17 Sec.	—	1,500 mph	40-50,000 ft.	SSE	Civilian	Could have been aircraft distorted by morning sun.
reported observing blue object with brilliant red	45 Min.	—	—	—	—	Civilian	Pending
	4 Sweeps & 6 Sweeps	—	3,700 mph	—	—	Radar Operators	Probable interference or jamming from some unknown source.
ved unusual radar returns while attempting to	—	—	High up to 1,090 mph	30,000 ft.	Varied	Radar Crew	Checked with Electronics Branch, ATIC. No conclusions.
Secret)	—	—	2052 K	—	—	Radar Observers	Checked with Electronics Branch, ATIC. No conclusions.
ted to have come into view from the SW and moved across ped, reversed direction and disappeared. (Confidential)	—	—	High	—	225°	RCAF Personnel	Pending additional info.
which appeared to almost collide with each other	30 Sec.	—	2 x jet a/c	5,000 ft.	NW	Military (AF)	See Appendix VI
aircraft - patrol plane in air at same time.	1 1/2 Min.	—	Slow	5,000 ft.	NW	Civilians	Could have been aircraft since early morning base would prevent clear observation.

SIGHTINGS OF UNIDENTIFIED OBJECTS

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	AL
3 May 52	2300	Phoenix, Ariz.	Two couples in convertible with top down observed cigar shaped, glowing white object descending slightly. (Confidential)	4 Sec.	—	500 mph	—
5 May 52	2200	Phoenix, Ariz.	Bluish-green light ascending slightly. (Confidential)	2 Sec.	—	1000 mph	10
7 May 52	—	Rio de Janeiro, Brazil	Photos of flying saucers taken by professional photographers. (Restricted)	—	—	—	—
7 May 52	1330	Nashville, Tenn.	Dark circular object with pendulum motion. (Unclassified)	5-8 Min.	—	Probably slow	Up
8 May 52	0227 EDST	Atlantic Ocean	PAA crew saw three lights, one after another, in opposite direction to them and at same altitude. (Confidential)	Few Sec.	—	Fast	15
9 May 52	1030 PDST	George AFB, Calif.	Round, silver object observed from ground and from two F-86's. (Restricted)	—	—	—	—
9 May 52	1250 PDST	George AFB, Calif.	Two silver metallic objects moving with the wind at a slow speed and at certain angles to the sun giving off a bright glare. Another report at the same time stated only one object sighted. (Restricted)	4 Min.	—	—	4,00
				20 Sec.	—	—	30,0 ft
9 May 52	1750 PDST	George AFB, Calif.	Dull colored object shaped like arrowhead which flew straight and level course. (Restricted)	10 Sec.	—	1500 mph	30,0 ft
10 May 52	1500 MST	Albuquerque, N.M.	Two silver disc-shaped objects at different altitudes. (Confidential)	5-10 Min.	—	—	—
10 May 52	2240	Augusta, Ga.	Initially four discs observed then, 20 minutes later, one more was observed and finally, 10 minutes later another disc was observed. The discs appeared to be 15 inches in diameter and yellow or gold in color.	Few Sec.	—	High	Hi fo wh va
11 May 52	0121-0132	Seattle, Wash.	Red body tracing streaks or sparks. (Restricted)	4 Sec.	Explosion	—	—
11 May 52	2058 CST	Deephaven, Minn.	Object bright as meteor with a short tail on it. (Restricted)	10 Sec.	—	Fast	—
11 May 52	1220 & 1226	George AFB, Calif.	Three objects, one of which resembled a paper plate and was white, were observed in two sightings six minutes apart. (Restricted)	1 Min.	—	—	10,000 30,000
13 May 52	1115Z	El Centro, Calif.	a. Five flying saucers as large as B-36 with light underneath. b. F-94 pilot reported shooting star. c. Sheriff sighted object like parachute flare. d. Tower operator sighted pulsating orange and blue object hovering and changing position. (Confidential)	—	—	Terrific	—
13 May 52	1425 PDST	George AFB, Calif.	A round, shiny, metallic object which appeared to reflect or glow white or silver was observed from T-60 aircraft at 10,500 ft. (Restricted)	30 Min.	—	Stationary	15,
14 May 52	1405-1430 PDST	George AFB, Calif.	Same as above.	25 Min.	—	—	Over
15 May 52	2135	Washington, D.C.	Goldish-orange, saucer-like object gave impression of spinning motion. Two observers at different levels, i.e., one at street level while other at roof level, hence variations in observation. (Restricted)	6-10 Sec.	—	Slow and/or extremely fast	low

ATIC FORM NO. 328

IGHTINGS OF UNIDENTIFIED OBJECTS

N OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
n observed cigar shaped, glowing white object	4 Sec.	—	500 mph	—	W	Civilians	Meteor or fireball.
(Confidential)	2 Sec.	—	1000 mph	10,000 ft.	NE	Civilian	Description is similar to meteor or fireball.
rsonal photographers. (Restricted)	—	—	—	—	—	—	See Appendix II.
on. (Unclassified)	5-6 Min.	—	Probably slow	Unknown	SW	Civilian	Pending
ther, in opposite direction to them and at	Few Sec.	—	Fast	15,000 ft.	N	PAA Pilots	See Appendix III.
and from two F-86's. (Restricted)	—	—	—	—	—	AF Pilots	See Appendix VI.
wing at a slow speed and at certain angles	4 Min.	—	—	4,000-5,000 ft.	Motionless	Military (AF)	See Appendix VI.
reports at the same time stated only	20 Sec.	—	—	30,000-40,000 ft.			
... straight and level course.	10 Sec.	—	1500 mph	30,000-40,000 ft.	S	Airman	See Appendix VI.
ent altitudes. (Confidential)	5-10 Min.	—	—	—	NE	Lt Col and Wife	Pending
minutes later, one more was observed and ...ar observed. The discs appeared to be ...d in color.	Few Sec.	—	High	High except for last which was very low.	N	Civilians	Pending
estricted)	4 Sec.	Explosion	—	—	N	Many	See Appendix IV.
ail on it. (Restricted)	10 Sec.	—	Fast	—	SE	Civilian	Resembles meteor.
a paper plate and was white, were observed Restricted)	1 Min.	—	—	10,000-15,000 ft. 30,000-40,000 ft.	Varied	Airman	See Appendix VI.
...s with light underneath.	—	—	Terrific	—	SW	Many	See Appendix V.
...te flare. ...range and blue object hovering and changing							
...ch appeared to reflect or glow white ...ft at 10,500 ft. (Restricted)	30 Min.	—	Stationary	45,000 ft.	—	AF Pilot and Airman	See Appendix VI.
	25 Min.	—	—	Over 40,000 ft.	—	AF Pilot and Airman	See Appendix VI.
...impression of spinning motion. Two observers ...level, while other at roof level, hence	6-10 Sec.	—	Slow and/ or extremely fast	Low	S	Two ensigns USN and others.	None

APPENDIX I

Artesia, New Mexico - 16 January 1952

I. DESCRIPTION OF INCIDENT

On 16 January 1952, two members of a balloon project from the General Mills Aeronautical Research Laboratory and four other civilians observed two unidentified aerial objects in the vicinity of the balloon they were observing. The balloon was at an altitude of 112,000 ft. and was 110 ft. in diameter at the time of the observation.

The objects were observed twice, once from Artesia, New Mexico, and once from the Artesia Airport. In the first instance, one round object appeared to remain motionless in the vicinity, but apparently higher, than the balloon. The balloon appeared to be 1½ inches in diameter and the object 2½ inches in diameter (ratio 3:5) and the color was a dull white. This observation was made by the two General Mills observers.

A short time later the same two observers and four civilian pilots were observing the balloon from the Artesia Airport. Two objects at apparently extremely high altitude were noticed coming toward the balloon from the northwest. They circled the balloon, or apparently so, and flew off to the northeast. The time of observation was about 40 seconds. The two objects were the same color and size as the first object. They were flying side-by-side. When the objects appeared to circle the balloon, they disappeared and the observers assumed they were disc-shaped and had turned on edge to bank.

II. STATUS OF INVESTIGATION

Unfortunately this report was not made until 5 April and did not reach ATIC until 16 April. Due to this time lapse, no further investigation is contemplated. The observers are known to be very reliable and experienced.

III. CONCLUSIONS

None.

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APPENDIX II

Nenana, Alaska - 22 January 1952

I. DESCRIPTION OF INCIDENT

At 1020Z on 22 January 1952, a radar station at Murphy's Dome, Alaska, observed an unidentified radar return. The target was going away from the station on an azimuth of 210°, at a speed of about 1500 mph when first observed but appeared to reverse its direction and returned toward the station. The set was adjusted so that the target could be observed as it closed in on the station but after this change was made the target was no longer observed. Seven minutes later (approximately 1030Z) the target was again observed, however, at about its original location, and again going away from the station. Just before it faded it appeared to be making a turn back toward the station.

At 1030Z an F-94 was airborne to search for the object. At this time the object was going away from the station at a high rate of speed so the F-94 was told to orbit. About this time the ground station lost contact with the object but continued to track the F-94.

At about 1100Z as the F-94 was approaching Nenana (near Fairbanks), the radar observer in the F-94 observed two targets, one faint and one bright. The aircraft was at 30,000 ft. and the target was at 25,000 ft. The targets crossed from right to left and appeared to be traveling slowly and as the F-94 approached the target a high rate of closure was indicated. The contact was lost at a range of 200 yards.

Approximately one hour later, again near Nenana, another contact was made by the F-94. In this instance the target was kept dead ahead and level. When the target was at a range of 200 yards, the pilot pulled up and the target was lost. The rate of closure during the run was 100 knots even though the F-94 had flaps down. No other contacts were made and the aircraft was released at 1210Z.

During the two airborne contacts the F-94 was being tracked by the ground station but the object was not being picked up.

The weather was clear but no visual sighting was made. On the same night, the same crew had visually identified a C-54, a C-47, and a small civilian aircraft from 300 to 500 yards. There were no clouds in the sky but it was a dark night.

No malfunctions were found in either radar set.

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II. STATUS OF INVESTIGATION

Report is being studied by the Electronics Branch of ATIC.

III. CONCLUSIONS

Pending.

APPENDIX III

Benson, Arizona - 3 April 1952

I. DESCRIPTION OF INCIDENT

On 3 April 1952 at 0815 MST, three civilian AF pilot instructors and several other people observed an object from the Benson, Arizona, airport. The object was about the size of a bright star but was prominent enough to be continually observed (i.e. not necessary to scan the sky to find it).

At 0823 MST, one of the instructors took a fix on the object by sitting in a T-6 and sighting across the canopy with the aircraft on a magnetic heading of 255° at the time. Fixes were taken at intervals until 0914 at which time the object disappeared. The object did not move during the 51 minute period. How the object disappeared is not known as one of the observer's attention was distracted for about 15 seconds and when he looked up the object was gone.

One of the instructors flew a T-6 up to 13,500 ft. in an attempt to better observe the object, however, there was no relative change in the size.

Several cadets flying T-6's in the area also observed the object.

II. STATUS OF THE INVESTIGATION

The excellent forethought of the instructor to take continual fixes on the object has eliminated the possibility of the object being an aircraft or balloon since no motion was observed. In addition, an investigation was made and it was determined that there were no balloons in the area.

It is possible that the object was a bright planet. This is doubtful, however, since a planet would appear to move some in 51 minutes.

The approximate elevation of the fix has been requested. In the original report it was given as "two inches above the canopy". This angle will depend on height of the pilot, height of seat, etc. When this information is received, a nearly exact fix can be obtained and known astronomical bodies checked.

III. CONCLUSIONS

Pending.

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APPENDIX VI

Madison, Wisconsin - 16 April 1952

I. DESCRIPTION OF INCIDENT

This incident is cited not so much because it is outstanding but because of the excellent attempt at identifying the object by ADC units.

2015 CST: Civilian telephoned fighter operations of Truax Field to report that he had just sighted a formation of yellowish-white lights traveling at a high rate of speed on a heading of 90°.

2020 CST: Fighter operations called AC and W Squadron. The radar was closed down for preventive maintenance but was operational within three minutes. A flight of F-80's were directed to investigate and returned with negative results. A flight of F-86's were sent to 30,000 ft., also returned with negative results.

In addition to this the AC and W Squadron Intelligence Officer checked all airline flights and checked two observatories for any unusual astronomical displays. Results were negative.

II. STATUS OF INVESTIGATION

It is possible that the observer saw either the F-80's or F-86's over Madison, since they were in the area, however, the source reported no sounds. The objects were also reported to have turned very sharply and climbed at a high rate of speed. Jet aircraft far enough away not to be heard would normally not appear to make a sharp turn and fast climb.

III. CONCLUSIONS

Source possibly observed jet aircraft in area and the apparent high speed and rate of climb was an illusion.

APPENDIX VII

Bethesda, Maryland - 18 April 1952

I. DESCRIPTION OF INCIDENT

Four civilians reported that they observed a V-formation of from 7 to 9 lights traveling north over Bethesda, Maryland, at 0130 EST on 18 April 1952.

The included angle of the formation or "V" was estimated to be 40°. There was one light at the apex and three to four in each leg. Each light appeared to be orange-yellow, circular, and to occupy 15 percent of the total length of the leg.

The formation, or object, was first sighted at an elevation of about 60° in the south and disappeared behind some trees at 60° in the north. The total time of observation was from four to eight seconds and there was no sound.

All four observers were interrogated and their accounts of the incident were similar. They stated that they had not seen the Life Magazine article describing the Lubbock incident prior to the sighting.

II. STATUS OF INVESTIGATION

The possibility of jet aircraft in the area was checked. A similar report of light formations did turn out to be very probably a B-45 type aircraft, however, no jets were known to be in the area at the time of this incident.

III. CONCLUSIONS

None.

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STATUS REPORT

PROJECT BLUE BOOK - REPORT NO. 7

FORMERLY PROJECT GRUDGE

PROJECT NO. 10073

31 MAY 1952

AIR TECHNICAL INTELLIGENCE CENTER
WRIGHT-PATTERSON AIR FORCE BASE
DAYTON, OHIO

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T52-11949

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AUTH: CO, ATIC
BY: E.J. RUPPELT
1st Lt, USAF
DATE 19 June 52

This report is the seventh of a series of monthly status reports of Project Blue Book. Each report is written on or near the last day of the month and will contain a list of all incidents reported during the month covered by the report. The reports that are considered outstanding will be summarized in the appendices of the report so that more details can be presented. The overall status of the project will be presented.

Any additional information may be obtained on any incident by directing requests to Chief, Air Technical Intelligence Center, Attn: ATIAA-5, Wright-Patterson Air Force Base, Ohio.

The security classification of this report is Secret due only to the inclosure of reports that were classified Secret by the originating agency and due to the fact that allied information pertaining to the project is Secret. The classification of each separate incident is noted with the incident.

T52-11949

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STATUS OF PROJECT BLUE BOOK

I. OVERALL STATUS

A. Briefings on Project Blue Book

On 8 and 9 May 1952, three briefings were given on Project Blue Book in Washington, D. C. The people briefed included Secretary of Air Finletter, Major General Samford and Brig General Ackerman of the Directorate of Intelligence, Brig General Maxwell of the Research and Development Board, and members of the Office of Naval Research.

B. Field Investigations

During the month of May 1952, two field investigations were made.

1. 20-24 May 1952 - George Air Force Base, Calif.

2. 21 May 1952 - Pan American crew at New York, New York

C. Visit by Representative of the ONR

A representative of the Office of Naval Research visited ATIC on 28 May 1952. The purpose of the visit was to discuss the operation of Project Blue Book and to determine what aid, if any, the ONR could offer. It was decided that at the present time the Navy could best assist the Air Force by publishing some type of directive pertaining to reports of unidentified aerial objects. A liaison with the ONR was also established so that any contacts with the Navy can be expeditiously handled. (Action on the above Navy directive has been started.)

D. RCAF Interest in Project Blue Book

Two RCAF personnel, members of the Directorate of Scientific Intelligence, Defense Research Board of Canada, visited Project Blue Book at ATIC on 14 May 1952. Canada is setting up a project very similar to the U.S. Air Force project for the investigation of reports of unidentified aerial objects. The RCAF people were briefed on the operations of the project and the difficulties that have been encountered, and the proposed future plans were discussed.

Action is being taken to establish channels for communications between the Canadian and U.S. project personnel.

E. Current Directive for Reporting Sightings

On 29 April 1952, Air Force Letter 200-5, Subject: Reporting of Unidentified Flying Objects was published. This AFL states the channels to be

used in reporting, types of reports to be made, and the information to be included in reports. Although this AFL has only been in effect a month, excellent results in timely reporting have already become evident.

F. Information on Balloon Releases

A large amount of detailed information on the release of weather sounding balloons has been received from the Air Weather Service. The information includes the times, locations, and types of balloons launched daily in the United States. This information has been plotted on a map and incorporated into a card file so that it is now possible to make a rapid check of all sightings for the possibility of their being balloons.

G. Contractor Status

The civilian contractor for Blue Book has finished a tentative questionnaire to be used in interrogating observers. A great deal of time has been spent in selecting and wording of the questions. Approximately twelve engineers and scientists in varied fields have been consulted and have given their comments on the form. An effort has been made to word the questions so that they are not "leading" and so that the maximum amount of information may be obtained. An astronomer and a psychologist will be consulted next and after their comments have been received the questionnaire will be finalized.

The contractor, which is a civilian research institute, has also established a panel of twelve scientists and engineers. These people, all specialists in certain fields, can be called together at the request of ATIC to discuss any pertinent reports, questions, or problems that arise. In the past month, two meetings were held to discuss the questionnaire.

H. Diffraction Grating Cameras

This phase of the project is not being handled directly by Project Blue Book and the exact status is unavailable at the time of this report.

I. Utilization of ADC Scope Cameras

A request has been sent to Air Defense Command asking them to put all of the Type O-15 Radar Scope Cameras on a 24-hour alert basis so that any unidentified radar returns may be photographed. These photographs, in conjunction with a special electronics questionnaire that has been prepared by ATIC, will aid in the interpretation of the electronic observations.

J. Recent "Mirage" Theories

Several theories on the possibility that some sightings can be explained as a type of mirage have been offered to ATIC. These theories have been accepted,

as theories, and will be investigated. More details on the ideas have been requested and as soon as they are received they will be submitted to the Blue Book civilian contractor's panel for analysis and comments.

SIGHTINGS OF UNIDENTIFIED OBJECTS

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED
2 Feb 52	0650	Eastern Pacific	MATS Crew observed what appeared to be a red rocket burst at an estimated 500 yds. off the port wing of the a/c. (Confidential)	—	—	—
8-12 Mar 52	2130Z	Pacific Ocean	Three puffs of white smoke. (Confidential)	—	—	—
15 Mar 52	1630 MST	Sandia Mt. Range, New Mexico	Dull aluminum object, shaped like flattened oval and as large as B-29 fuselage. (Confidential)	15 Min.	—	150-200 mph and stationary
23 Mar 52	0205Z	Yakima, Wash.	Ground radar sighting and F-94 visual sighting of flash of light. (Secret)	—	—	75 Knots
2 Apr 52	2000	Brownwood, Tex.	Slow moving meteor-like object with trail of three small balls of fire. (Restricted)	40 Sec.	—	—
2 Apr 52	2035	Waco, Texas	Flaming object approaching from southwest. Flame yellow and emitted sparks. (Restricted)	30 Sec.	—	—
2 Apr 52	Between 0900&1000	Lake Meade, Nev.	Very large, silver object which moved very little. (Restricted)	1 Hour	—	—
3 Apr 52	0823	* Marana AFB, Ariz.	Several sources observed large object in sky which remained stationary. (Restricted)	52 Min.	—	Hovered
5 Apr 52	2115 EST	Miami, Fla.	Four dark shapes passed across face of moon, objects were circular, dark, opaque and invisible except when outlined against moon. (Confidential)	—	—	—
5 Apr 52	1040	Phoenix, Ariz.	Three large, circular objects of dull gray color with no wings, flame, or smoke. (Restricted)	—	—	1/2 falling comet
6 Apr 52	1459	Ft. Hood, Texas	Group of 50 or 75 grayish-white objects shaped like a disc and in formation, changing position constantly. (Restricted)	3-30 Min.	—	—
7 Apr 52	0445 CST	Memphis, Tenn.	Dazzling blue-white object with reddish glow near top and shaped like cotton basket. Was much larger than a/c at same distance. (Restricted)	Few Sec.	—	Many times commercial aircraft
9 Apr 52	1432 CST	* Shreveport, La.	C-46 sighted a disc-shaped, whitish cream colored object which circled Barksdale AFB. (Confidential)	—	—	200-400 mph
10 Apr 52	0415	Ada, Minn.	Object traveled in horizontal plane. It started out as a circle became oval and then split into parts, all of equal brightness. (Restricted)	—	—	—
11 Apr 52	1825	Washington, Ind.	Streak of deep orange came toward sources from the west, turned northeast and reduced the exhaust. (Restricted)	4 Min.	—	—
13 Apr 52	2107 CST	Biloxi, Miss.	Three round, dull orange objects over the Gulf of Mexico. (Restricted)	4-5 Sec.	—	Fast
14 Apr 52	—	LaCrosse, Wis.	Several light colored objects in V formation. (Unclassified)	—	—	Fast
14 Apr 52	1834 CST	Memphis, Tenn.	Bright inverted bowl, with slots running vertical and glowing red. (Restricted)	45-60 Sec.	—	Rapid

ATIC FORM NO. 328 *Previously mentioned in Status Report No. 6.

SIGHTINGS OF UNIDENTIFIED OBJECTS

PTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
o be a red rocket burst at an estimated 500 yds. nfidential)	—	—	—	5,000 ft.	—	MATS Crew	Delayed report. No investigation due to time lapse in report.
idential)	—	—	—	—	—	MATS Crew	No investigation due to time lapse in report.
flattened oval and as large as B-29 fuselage.	15 Min.	—	150-200 mph and stationary	10,000 ft.	—	AF Officer	No conclusions. Report too late to investigate.
al sighting of flash of light. (Secret)	—	—	78 Knots	22,500 and 25,000 ft.	30° and 180°	Pilot and Ground Radar Operator	No conclusion.
trail of three small balls of fire. (Restricted)	40 Sec.	—	—	30°	—	AF Officer	Too great lapse of time to get accurate data.
...ower. Flame yellow and emitted sparks.(Restricted)	30 Sec.	—	—	2,000 ft.	NE	Tech Advisor - Instructor	Resembles fire ball.
...y little. (Restricted)	1 Hour	—	—	Tremendous	—	M/Sgt and wife	No conclusion.
...sky which remained stationary. (Restricted)	52 Min.	—	Hovered	High	Hovered	AF Personnel	Pending.
...noon, objects were circular, dark, opaque and ...noon. (Confidential)	—	—	—	—	90°	Civilians	No conclusion.
...gray color with no wings, flame, or smoke.	—	—	1/2 falling comet	40,000 ft.	N	Civilians	Three F-51's in area and flying north at the time.
...ects shaped like a disc and in formation, changing	3-30 Min.	—	—	30° - 40°	—	Civilian	No conclusion.
...glow near top and shaped like cotton basket. ...tance. (Restricted)	Few Sec.	—	Many times commercial aircraft	—	NNW	Civilian	Similar to fire ball or meteor.
...cream colored object which circled Barksdale AFB.	—	—	200-400 mph	4,000 ft.	W & SE	AF Pilots	Two F-51 and three silvery-white balloons were in the area at time.
...It started out as a circle became oval and then ...ntinued. (Restricted)	—	—	—	—	S	Civilians	Possibly Fire ball
...source from the west, turned northeast and	4 Min.	—	—	Very high	NE	Civilians	Could be the vapor trail of an aircraft being struck by the rays of the setting sun.
...r the Gulf of Mexico. (Restricted)	4-5 Sec.	—	Fast	30°	W	AF Officer	No conclusions.
...formation. (Unclassified)	—	—	Fast	12-20,000 ft.	NW	Airline Pilot	No conclusions.
...ning vertical and glowing red. (Restricted)	45-60 Sec.	—	Rapid	2,000 ft.	—	Navy Pilots	No conclusions.

SIGHTINGS OF UNIDENTIFIED OBJECTS

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED
1 Apr 52	0030	Port Chicago, Calif.	Source reported large bright light moving faster than an aircraft and in an erratic flight path. Object left a streak of flame. (Restricted)	---	---	High
2 Apr 52	2045	Temple, Texas	Large meteor-like object was seen traveling across the sky at high speed. Object had trail. (Confidential)	30 Sec.	---	High
3 Apr 52	0805	Marana, Arizona	Several sources observed large object in sky. Object remained stationary. (Restricted) (See Appendix III.)	52 Min.	---	Hovered
7 Apr 52	1800	St. Louis, Mo.	Sources observed shiny object which hovered then appeared to disappear at high speed. (Restricted)	5 Min.	---	High
7 Apr 52	1830	St. Louis, Mo.	Source observed rectangular object about size of C-47. Object emitted white sparks. (Restricted)	---	---	---
7 Apr 52	Day-break	Walnut, Miss.	Sources observed large white object "streaking" through the sky. No trail observed. (Restricted)	Several Seconds	---	High
8 Apr 52	0900-1000	Lake Meade, Nev.	Object appeared to be "B-26 without wings". (Restricted)	1 Hr.	---	Hovered
8 Apr 52	2000	Duncanville, Tex.	Unidentified radar return. (Secret)	---	---	2052 K.
9 Apr 52	1430	Shreveport, La.	Two C-46 crews observed disc-shaped object. (See Appendix IV) (Restricted)	---	---	---
9 Apr 52	2325	Medford, Mass.	Object report to be large, cigar-shaped, and bluish in color. It traveled a straight course and disappeared over the horizon. Viewed from the top of a building. (Confidential)	2 Min.	---	High
10 Apr 52	2010	Ft. Lauderdale, Fla.	Source observed elliptical shaped brilliantly illuminated object without trail moving at high speed. (Restricted)	---	---	High
12 Apr 52	2230	North Bay, Ont.	One bright amber disc was reported to have come into view from the southwest and moved across the RCAF airfield. It then stopped, reversed its direction, and disappeared. (Restricted)	---	---	High
13 Apr 52	1645	Moriarity, N.Mex.	Four observers observed circular object over station. Object traveled at high speed and made an abrupt turn. (Confidential)	Few Sec.	None	High
16 Apr 52	2015	Madison, Wis.	Source reported observing five to six objects in formation. Objects were yellowish-white. They came into view from the east made a sharp turn to the NNW and disappeared. (Secret) (See Appendix VI.)	Few Sec.	None	High
16 Apr 52	2225	Shreveport, La.	Object was circular and brilliant white, ten times the size of the brightest planet. The object was first sighted overhead. It traveled a straight course at high speed. It was on an original heading of 100° but made a 180° turn and took up reciprocal heading. (Restricted)	20 Sec.	None	High

ATIC FORM NO. 328

SIGHTINGS OF UNIDENTIFIED OBJECTS

TION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
ving faster than an aircraft and in an erratic of flight. (Restricted)	—	—	High	High	360°	Civilian	Description resembles meteor except for erratic flight path.
traveling across the sky at high speed. Object	30 Sec.	—	High	—	30°	Many	Object was apparently a large fireball. Reports on this object were received from all over Texas. Astronomers believe it was a fireball.
ct in sky. Object remained stationary. (Restricted)	52 Min.	—	Hovered	High	Hovered	AF personnel	Pending. See Appendix III.
hovered then appeared to disappear at high speed.	5 Min.	—	High	—	—	Civilians	No investigation. Lack of data. No conclusions.
size of C-47. Object emitted white sparks.	—	—	—	—	—	Civilian	No investigation. Lack of data. No conclusions.
ing" through the sky. No trail observed.	Several Seconds	—	High	Appeared low	—	CIC Agent	Probably large meteor or fireball. Several reports of similar object from Missouri and Tennessee.
wings". (Restricted)	1 Hr.	—	Hovered	High	—	AF M/Sgt	No conclusions. Lack of data.
)	—	—	2052 K.	—	—	Radar Observers	Pending.
object. (See Appendix IV) (Restricted)	—	—	—	Below 12,000ft.	Varied	AF Pilots	Pending. (See Appendix IV.)
ped and bluish in color. It traveled a straight ion. Viewed from the top of a building.	2 Min.	—	High	—	225°	Civilian	Description similar to large meteor or fireball.
rilliantly illuminated object without trail moving	—	—	High	—	270°	Ex-AF Pilot	Description similar to large meteor or fireball
to have come into view from the southwest and moved stopped, reversed its direction, and disappeared.	—	—	High	—	225°	RCAF Personnel	Pending addition information.
ject over station. Object traveled at high speed	Few Sec.	None	High	High	90° -360°	AF Airman	See Appendix V.
objects in formation. Objects were yellowish- ast made a sharp turn to the NNW and	Few Sec.	None	High	—	90°	Civilian	See Appendix VI.
ross the disc of the brightest planet. traveling a straight course at high speed. made a 180° turn and took up reciprocal	20 Sec.	None	High	—	100°-280°	AF Pilot	Radiosonde balloon (unlighted) was in area. Half moon low in East at time of sighting. Possibly balloon but no definite conclusions. Speed might be due to illusion of some type.

SIGHTINGS OF UNIDENTIFIED OBJECTS

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	AL
17 Apr 52	---	Point Hope, Alaska	Unidentified vapor trails. (Secret)	---	---	---	---
17 Apr 52	2125	Ft. Eustis, Va.	Source observed bright white object with green trail East of Ft. Eustis at an elevation of 45°. Object traversed 90° in few seconds. Object traveled in flat trajectory. (Restricted)	2 Sec.	None	High	---
20 Apr 52	1815	W-P AFB, Dayton, Ohio	A bright white light was observed traveling through the air at high speed. Object appeared to be flat and long and did not change shape during flight. (Restricted)	15-30 Sec.	None	High	---
18 Apr 52	0130	Bethesda, Md.	Four observers saw U-shaped group of lights. (See Appendix VII) (Restricted)	4-6 Sec.	None	High	---
21 Apr 52	0405	LaCrosse, Wis.	Source observed object which "appeared to be rotating with fire coming out of both ends". Observed through windshield during rainstorm. (Restricted)	---	"Whooshing"	---	---
21 Apr 52	2215	Colorado Springs, Colo.	An object resembling a "flying wing" aircraft was observed. It appeared to have swept wings, 10 times larger than jet fighter, and had a luminous glow. Object was observed through bare tree branches. (Restricted)	5-10 Sec.	None	Moderate	Mod
21 Apr 52	2010	Clovis, N. Mex.	Object seemed to be made up of many orange colored lights, sometimes fused, sometimes split. It would remain motionless at times and at other times would accelerate to high speeds. (Restricted)	5 Min.	None	High	---
27 Apr 52	1920	Waskish, Minn.	Object was cigar-shaped with no wings. It gave off reflection of the sun. (Restricted)	1 Min.	None	High	---
27 Apr 52	2030 to 2230	Yuma, Ariz.	Objects appeared as bright red or flame colored discs slightly larger than fighter aircraft. Eight objects were sighted at various times. Once two objects were in formation. Scattered overcast at 6,000 ft., solid at 11,000 ft. Observed from drive-in movie.	Periodically for 2 Hr.	None	---	Bel
27 Apr 52	1100	Royal Oak, Mich.	Source observed small white object "similar to paper plate" in sky. (Restricted)	Seconds	---	---	---
27 Apr 52	1700	Roseville, Mich.	Four observers watched several objects. Some of the objects were circular, some oval shaped. All were silver in color. They were observed with binoculars. (Restricted)	45 Min.	None	Varied	---
27 Apr 52	2000	Selfridge AFB, Mich.	Source observed large bright flash of green light which persisted for 3-4 seconds. (Restricted)	3-4 Sec.	None	---	---
27 Apr 52	2305	Pontiac, Mich.	Source observed "huge" circular object very close to the ground. Estimated 200 ft. in diameter.	---	---	---	200

SIGHTINGS OF UNIDENTIFIED OBJECTS

DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
(Secret)	---	---	---	---	---	---	Possibly Soviet overflight. (ADC evaluation)
...e object with ...green trail East of Ft. Eustis at an elevation ...30° in few seconds. Object traveled in flat trajectory.	2 Sec.	None	High	---	---	Army Lt Col	Description resembles that of a fireball or meteor.
...observed traveling through the air at high speed. Object ...ng did not change shape during flight. (Restricted)	15-30 Sec.	None	High	---	90°	AF Officers	Description resembles that of large meteor.
...group of lights. (See Appendix VII) (Restricted)	4-8 Sec.	None	High	---	360°	Civilians	See Appendix VII.
...appeared to be rotating with fire coming out of both ...ejectors. (Restricted)	---	"Whooshing"	---	---	180°	County Nurse	Object may have been light blurred by rain on windshield of automobile.
...was observed. It appeared to have ...and had a luminous glow. Object was	5-10 Sec.	None	Moderate	Moderate	315°	Civilian	No conclusions. Insufficient data.
...sometimes fused, sometimes ...other times would accelerate to	5 Min.	None	High	---	135°	AF Flight Surgeon	No conclusions.
...no explanation except off reflection of the sun. (Restricted)	1 Min.	None	High	---	360°	Civilian - Ground Observer	Description similar to meteor.
...red or flame colored discs slightly larger than fighter ...sighted at various times. Once two objects were in ...at 6,000 mph, solid at 11,000 ft. Observed from	Periodically for 2 Hr.	None	---	Below 11,000 ft.	Varied	AF Tower Operator	No conclusions.
...object "similar to paper plate" in sky. (Restricted)	Seconds	---	---	---	---	Civilian	No conclusions. Lack of data.
...al objects. Some of the objects were circular, some ...s in color. They were observed with binoculars.	1/2 Min.	None	Varied	---	Varied	Four civilians	No conclusions. Too fast for balloons. No aircraft in the area.
...flash of green light which persisted for 3-4 seconds.	3-4 Sec.	None	---	---	---	AF Intelligence Officer	No conclusions.
...lar object very close to the ground. Estimated 200 ft.	---	---	---	200 ft. (Est)	---	Civilian	Information extremely doubtful.

T52-10589

SIGHTINGS OF UNIDENTIFIED OBJECTS

DATE	TIME (Local)	LOCATION	DESCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALT
20 May 52	1125 PDST	George AFB, Calif.	Third separate report by airman at approximately same time and with same description. Others 13 and 14 May. (Unclassified)	5 Min.	—	Stationary	—
20 May 52	2210	Houston, Texas	Very bright orange white light moving toward observers from north at an angle of 45° with erratic movements from side to side.	90 Sec.	—	—	—
21 May 52	0630 CDST	Lombard, Ill.	Spherical glass-like object dented mail box and bounced onto porch. Source attempted to pick up object but it was too hot.	—	—	—	—
22 May 52	1240 PDST	Stockton, Calif.	A silver, rectangular object hovering in sky and eventually fading away. (Restricted)	25 Min.	—	Stationary	30,0
22 May 52	—	Alexandria, Va.	Oval-shaped, reddish glow, moving very rapidly on erratic course. (Unclassified)	—	—	—	5,0
24 May 52	0827Z	Zuni, N. M.	Two torpedo shaped objects, reddish in color, appearing not to have center section and traveling in arc. (Restricted)	15 Sec.	—	—	Desc
25 May 52	1658Z	Tierra Amarilla, N. M.	Observed with OPs-5 radar. Appeared on scope three times on two radar sets. (Secret)	40 Sec.	—	1600 mph	—
25 May 52	2127 CST	Randolph AFB, Texas	Tear-drop shaped objects like white light with an orange tinge in a very tight "V" formation and in three groups of four each. (Restricted)	3 Sec.	—	Comparable to falling star (1500-2000 mph)	Abov ft
28 May 52	1346 MST	Kirtland AFB, N.M.	Three pinkish objects in trail formation sighted from ground. (Restricted)	6	—	—	Vari

AFIC FORM NO. 328

SIGHTINGS OF UNIDENTIFIED OBJECTS

SCRIPTION OF INCIDENT	LENGTH OF TIME OBSERVED	SOUND	SPEED	ALTITUDE	HEADING	SOURCE	ACTION OR COMMENTS
...approximately same time and with same description.	5 Min.	—	Stationary	—	—	Airman	See Appendix VI.
...and observers from north at an angle of 45°	90 Sec.	—	—	—	S	AF Pilots	Similar to meteor except for erratic movement.
...and bounced onto porch. Source attempted	—	—	—	—	—	Civilian	Glass marble with tar-like covering origin unknown.
...ing in sky and eventually fading away. (Restricted)	25 Min.	—	Stationary	30,000 ft.	—	Civilians	None.
...rapidly on erratic course. (Unclassified)	—	—	—	5,000 ft.	—	Civilian	Insufficient information.
...ion, appearing but to have center section	15 Sec.	—	—	Descending	S	TWA Pilot	Resembles fireball or other astronomical activity.
...three times on two radar sets. (Secret)	40 Sec.	—	1600 mph	—	325°	Radar	Pending
...in a very tight "V" for-	3 Sec.	—	Comparable to falling star (1500-2000 mph)	Above 10,000 ft.	E	USAF Navigator, wife and friend	Pending
...sighted from ground. (Restricted)	4	—	—	Varied	W	Civilians	Pending

APPENDIX I

Fargo, North Dakota - 25 April 1952

I. DESCRIPTION OF INCIDENT

Between 2100 and 2145 hours on 25 April 1952, eight observers reported sighting unidentified flying discs which appeared in a wide "V" formation. There were five discs per flight and a total of five flights at eight minute intervals. The direction of flight was consistently south to north.

The formation was described as a wide "V", irregular or more specifically, sloppy, in that the disc pilots, if such is the case, appeared to have trouble maintaining constant speed and altitude.

II. STATUS OF THE INVESTIGATION

The Commanding Officer of Detachment 2, 462nd Ground Observer Squadron, Fargo Filter Center, Fargo, North Dakota, followed up the report personally. He proceeded to the top (10th floor) of the Black Building in Fargo, North Dakota, at about 2030 hours on 28 April 1952 equipped with binoculars, high-speed camera, telescope, etc., and awaited the mysterious flights. A number of local citizens shared his vigil with him.

III. CONCLUSIONS

The unidentified discs seen traveling very high and fast and of bright red and orange color were identified by the above observers (II) as being migrating mallard and teal ducks.

APPENDIX II

Rio de Janerio, Brazil - 7 May 1952

I. DESCRIPTION OF INCIDENT

On 7 May 1952 two photographers of "O Cruzeiro" Magazine in Rio de Janerio, Brazil, reported that they had photographed a "flying disc" at a position 23° 01' S, 43° 26' W. The object reportedly was in view one minute during which time five photographs were taken.

It approached from the southeast, made a 180° turn and went out of sight toward the sea at what was described as high speed. The color of the object was blue-gray and it seemed to be over 1000 meters in altitude and about twice the size of a DC-3.

II. STATUS OF THE INVESTIGATION

The photographers reportedly were asking $25,000 for the five negatives, consequently, the negatives are not available for study.

III. CONCLUSIONS

Until the negatives are analyzed, it is impossible to draw any definite conclusions. It is doubtful that the pictures and story are authentic.

APPENDIX III

Atlantic Ocean - 8 May 1952

I. DESCRIPTION OF INCIDENT

On 8 May, approximately 600 miles off the east coast of the United States, between Jacksonville, Florida, and Savannah, Georgia, the pilot and co-pilot of Pan American Airline Flight 203, enroute to San Juan from New York, sighted three unidentified aerial objects. The objects were on a reciprocal heading of approximately 355° to 360° at the same altitude as the airliner.

The first object resembled a landing light but was much whiter and about ten times as large. It was followed by two slightly smaller orange objects with tapering tails which were fringed with blue. These three round objects were equally spaced and between 1/8 and 1/4 mile off the left wing.

II. STATUS OF THE INVESTIGATION

The sources were interrogated and stated that the objects were completely foreign to them. There was no known missile, naval or air activity in the area at that time.

III. CONCLUSIONS

No conclusions.

APPENDIX IV

Seattle, Washington - 11 May 1952

I. DESCRIPTION OF INCIDENT

At approximately 0124 to 0132 PST, on 11 May 1952 many individuals reported sighting a vivid blue object with flaming sparks or streamers coming nearly straight down over Seattle, Washington. The object exploded in a brilliant flash, lighting up the sky and then disappeared. After the explosion, some of the witnesses experienced a tremor or shock wave of approximately nine seconds duration.

II. STATUS OF THE INVESTIGATION

Two local astronomers were contacted and they stated that the object was a meteor. At the present time the astronomers are searching for fragments to confirm their statement.

III. CONCLUSIONS

Object was probably a meteor but file will not be closed until confirming evidence is found.

APPENDIX V

El Centro, Calif., Area - 13 May 1952

I. DESCRIPTION OF INCIDENT

In the El Centro, Calif., Area on 13 May 1952 four separate reports of unidentified aerial objects were made. They were as follows:

a. 1115Z - Hovering over El Centro, five "flying saucers" as large as B-36's, with a light underneath, disappeared to the southwest at a terrific rate of speed. They were reported by the El Centro Sheriff's Office.

b. 1115Z - An F9F pilot taking off from El Centro Naval Air Station reported what appeared to be a shooting star diving at an angle of 60°.

c. 1142Z - A sheriff's car at Neland, Calif., sighted a strange object resembling a parachute flare over the south end of the Salton Sea.

d. 1150Z - A control tower operator at Yuma, Arizona, sighted an orange and blue object 320° and 20 miles from his position. After hovering for a short time in one position, it changed to another position and began hovering again. Operator said it was sighted for too long a period to be a falling star.

II. STATUS OF INVESTIGATION

There were no AF fighters airborne at the time but four F9F's from El Centro Naval Air Station were airborne from 1100Z to 1230Z.

III. CONCLUSIONS

a. It is possible that the F9F's and what appeared to be a shooting star account for the first report.

b. What appeared to be a shooting star was probably a meteor.

c. No conclusions.

d. The tower operator stated that he had observed the same phenomenon several times previous and is convinced that it is merely the reflection of automobile headlights on the highway at night.

APPENDIX VI

George AFB, Calif. - 1, 9, 13, 14, 20 May 1952

I. DESCRIPTION OF INCIDENT

The sighting on 1 May 1952 at George AFB, Calif., was the first of a series of nine sightings there in a three week period. These sightings were all by military personnel.

a. 1 May 1952 - Five round, disc-shaped objects, flat white in color which gave no glare or reflection were sighted. They were in formation with three in front and two in the rear. The latter two darted around in a circular or zig-zag manner.

b. 9 May 1952, 1030 PDST - An unidentified round, silver object was sighted visually from the ground and from two F-86 aircraft.

c. 9 May 1952, 1230 PDST - Two unidentified objects moving with the current or breeze at a slow speed. They appeared to be a silver metal color with a dark spot in the center and at certain angles to the sun gave off a bright glare.

d. 9 May 1952, 1720 PDST - Object was of dull color like a thundercloud. It was shaped like an arrowhead but had no known aerodynamic features.

e. 11 May 1952, 1220 PDST - Object looked like a white paper plate flipping end over end with an initial speed comparable to a jet although later it reduced its pace.

f. 13 May 1952, 1425 PDST - Single object, appeared round, shiny, metallic which glowed or reflected white or silver was observed for thirty minutes.

g. 14 May 1952, 1405 to 1430 PDST - Same description as object sighted on 13 May and by same sources.

h. 20 May 1952, 1425 PDST - A silver colored, bright, round object was observed for five minutes. Initially the object was stationary but eventually moved and faded away.

II. STATUS OF INVESTIGATION

Only balloons released from Edwards AFB can be tracked accurately over George AFB, consequently, for the most part they are the only balloons with which we are concerned. These balloons are released irregularly thus accounting for some of the unusual times of sightings reported in cases which are probably balloons.

The project monitor of Blue Book went to George AFB to investigate the various reports.

a. 1 May 1952 - Report well documented. No additional information obtained.

b. 9 May 1952, 1030 PDST - A balloon was released from Edwards AFB, 55 minutes prior to this sighting.

c. 9 May 1952, 1230 PDST - No known activity which could account for sighting.

d. 9 May 1952, 1720 PDST - No known activity which could account for sighting.

e. 11 May 1952 - Third report in three days from same individual. No activity in area.

f. 13 May 1952 - Balloon launched from Edwards AFB at 1340 PDST.

g. 14 May 1952 - No balloon release officially reported.

h. 20 May 1952 - Balloon released from Edwards AFB at 1332 PDST.

III. CONCLUSIONS

a. 1 May 1952 - No Conclusions.

b. 9 May 1952, 1030 PDST - Very probable that the balloon released from Edwards AFB was the object sighted.

c. 9 May 1952, 1230 PDST - Very possible that paper was caught in the thermals and swept along. A similar sighting turned out to be just that.

d. 9 May 1952, 1720 PDST - No conclusions.

e. 11 May 1952 - No conclusions.

f. 13 May 1952 - Probably was balloon released from Edwards AFB, 45 minutes previous.

g. 14 May 1952 - Description fits incident of 13 May so perfectly it is highly probable that the object was a balloon.

h. 20 May 1952 - Balloon released 53 minutes prior to sighting was probably object observed.

APPENDIX VII

Nenana, Alaska - 22 January 1952

I. DESCRIPTION OF INCIDENT

At 1020Z on 22 January 1952, a radar station at Murphy's Dome, Alaska, observed an unidentified radar return. The target was going away from the station on an azimuth of 210°, at a speed of about 1500 mph when first observed but appeared to reverse its direction and returned toward the station. The set was adjusted so that the target could be observed as it closed in on the station but after this change was made the target was again observed, however, at about its original location, and again going away from the station. Just before it faded, it appeared to be making a turn back toward the station.

At 1030Z an F-94 was airborne to search for the object. At this time the object was going away from the station at a high rate of speed so the F-94 was told to orbit. About this time the ground station lost contact with the object but continued to track the F-94.

At about 1100Z as the F-94 was approaching Nenana (near Fairbanks), the radar observer in the F-94 observed two targets, one faint and one bright. The aircraft was at 30,000 ft. and the target was at 25,000 ft. The targets crossed from right to left and appeared to be traveling slowly and as the F-94 approached the target a high rate of closure was indicated. The contact was lost at a range of 200 yards.

Approximately one hour later, again near Nenana, another contact was made by the F-94. In this instance the target was kept dead ahead and level. When the target was at a range of 200 yards, the pilot pulled up and the target was lost. The rate of closure during the run was 100 knots even though the F-94 had flaps down. No other contacts were made and the aircraft was released at 1210Z.

During the two airborne contacts the F-94 was being tracked by the ground station but the object was not being picked up.

The weather was clear but no visual sighting was made. On the same night, the same crew had visually identified a C-54, a C-47, and a small civilian aircraft from 300 to 500 yards. There were no clouds in the sky but it was a dark night.

No malfunctions were found in either radar set.

II. STATUS OF INVESTIGATION

Report by Electronics Branch of ATIC.

Target being slanted instead of perpendicular to radii from radar station indicates possible weather target. Speed may be accounted for by the momentary appearance and disappearance of other weather targets. Further explanation cannot be made.

III. CONCLUSIONS

Target caused by weather phenomena.

T52-11949

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SECURITY INFORMATION

STATUS REPORT

PROJECT BLUE BOOK } - REPORT NO. 8

FORMERLY PROJECT GRUDGE

PROJECT NO. 10073

31 DECEMBER 1952

AIR TECHNICAL INTELLIGENCE CENTER
WRIGHT-PATTERSON AIR FORCE BASE
OHIO

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This report is the eighth of a series of Status Reports of Project Blue Book. Normally each report is written on or near the last of each month and includes all project activities for that month. This procedure has not been followed during the months of June, July, August, September and October due to an extremely heavy workload caused by an increase in reports. The procedure of listing all reported sightings will also be eliminated in this report since 886 reports were received during the period covered by this report and compiling such a list would not be feasible at the present time.

Any additional information may be obtained on any incident by directing requests to the Commanding General, Air Technical Intelligence Center, Attn: ATIAA-5, Wright-Patterson Air Force Base, Ohio.

STATUS OF PROJECT BLUE BOOK

I. OVERALL STATUS

The period since the last status report of this project was published (Project Blue Book Status Report #7, 31 May 1952) has produced a volume of reports exceeding the total number of reports received in the period 1947 to 31 Dec 51. For the month of Jul 52, the total was over 440 reports. During the period 1 Jun 52 to 31 Oct 52, the period covered by this status report, 886 reports have been received, evaluated, cross-indexed and filed. This total of 886 represents 149 more reports than had been received during the previous five-year period this project has been in existance. It should be noted that these reports are those coming through official channels to ATIC and do not include the approximately 800 letters received from the public during this period.

A noticeable increase in reports started in Jun 52 and reached a peak on 28 Jul 52 when 43 reports were received (see Appendix I). Much of the increased volume of reports can be accredited to the widespread publicity given by Life, Time, Look and many other magazines and newspapers. One noticeable characteristic of the reports is that in general the quality has improved, a factor which resulted from the distribution of Air Force Letter 200-5, Subject: "Reporting of Unidentified Flying Objects", and to widespread briefings given by Project Blue Book briefing teams.

In Jul 52 the workload of project personnel had risen to the point that the number of personnel was increased to a total of four officers, two airmen, and two secretaries. For a period of 45 days, a weather officer was on TDY to the project.

All reports received were screened and evaluated as soon as possible after they were received. A breakdown as to the evaluations of the reports is given below. The categories used in the evaluation of reports are as follows:

A. Unknown

These are reports that contain relatively enough data to evaluate, but cannot be associated with any known phenomenon or object. There is a possibility that some of these reported objects or phenomena in this category could be identified if more background data on balloon tracks, aircraft movements, etc., were available.

B. Insufficient Data

This category represents reports which do not contain enough data to evaluate. A great many of the cases are due to poor reporting on the

part of the reporting agency. All cases where there is only a single observer, unless his or her reliability is unquestionable, are put in this category.

C. Aircraft

This category of reports varies from those reports of objects that were definitely proven to be aircraft to those that were possibly aircraft. In evaluating reports as aircraft, a great deal of importance is put on any comments by the reporting officer about local air traffic. Another criterion is the elevation of the reported object. It has been found that if an observer sees an aircraft above a 60° angle from the horizon and is in a relatively quiet location, he can hear the sound of the aircraft. Thus all reports of moving lights at night or "shiny" objects in the daytime, moving at moderately fast speeds (i.e., in view for 2-5 minutes), and observed below 60° could be aircraft and are evaluated as aircraft. Conversely, any object that passes directly over, or within 30° of the zenith of an observer, at moderately fast speeds and if no sound is heard, is not likely to be an aircraft.

D. Balloons

Several criteria are used to determine whether a reported object was or possibly was a balloon. Objects that are reported to hover or move very slowly could be balloons. In this type of report, the times are checked. All weather balloons in the United States are launched at 0300Z, 0900Z, 1500Z and 2100Z. If an object is reported near a balloon launch site within an hour after these scheduled launch times, it is classed as a balloon. If the object is moving and a track is reported, the track is checked against winds aloft for that area. If the reported movement is with the wind at any altitude, the object could be a balloon. Many balloons are tracked by radio and radar and in these cases, the actual track of the balloon can be correlated with the data obtained from the observers.

The possibility of observers seeing balloons that have developed slow leaks and have drifted long distances is always present. In cases where the description of the object is identical to that of a balloon and yet no balloons can be positively determined as having been in that area, the report is evaluated as possibly a balloon on the chance that a balloon has become "lost" and has drifted into the area.

E. Astronomical

Reports in this category are those that are proven to be or are similiar in all respects to known astronomical bodies such as meteors, fireballs, planets, or stars. The estimated azimuth and elevation of a reported object and the time of the observation can be checked to determine the known location of astronomical bodies. In some cases, this is done by project personnel and in more difficult cases by an astronomer.

Meteors are identified mainly by the observer's description as to size, shape, and maneuvers. In some cases, exceptionally large meteors or fireballs are plotted by observatories and these plots are obtained.

F. Other

This category contains reports that have been proven to be known objects or phenomena, or the descriptions of the reported objects are similiar to reports of known objects that do not fall into the above categories. Examples of these are birds, anomalous radar phenomena, bugs, etc.

A percentage breakdown of the evaluation of reports is as follows:

A. June

Category	No. Reports	% Total
Unknown	57	38.77
Insufficient Data	23	15.64
Aircraft	14	9.52
Balloons	22	14.96
Astronomical	22	14.96
Other	9	6.12
	147	100.00%

B. July

Unknown	93	21.04
Insufficient Data	118	26.69
Aircraft	52	11.76
Balloons	107	24.21
Astronomical	57	12.89
Other	15	3.39
	442	100.00%

C. August

Unknown	34	15.59
Insufficient Data	55	25.23
Aircraft	28	12.84
Balloons	70	32.11
Astronomical	22	10.09
Other	9	4.13
	218	100.00%

Category	No. Reports	% Total
D. September		
Unknown	22	27.85
Insufficient Data	20	25.32
Aircraft	7	8.86
Balloons	12	15.19
Astronomical	12	15.19
Other	6	7.59
	79	100.00%
E. Cumulative total for June, July, August, and September		
Unknown	206	23.25
Insufficient Data	216	24.38
Aircraft	101	11.39
Balloons	211	23.81
Astronomical	113	12.75
Other	39	4.40
	886	100.00%

(Note: No breakdown for the month of October 1952 is included since at the time this report was written all October reports had not been evaluated.)

II. SPECIAL REPORT ON CONFERENCE WITH 44 PROFESSIONAL ASTRONOMERS

During the past summer a professional astronomer, under contract with ATIC as a consultant on Project Blue Book, held conferences with 44 professional astronomers in the U.S.A. and submitted a report of his findings. These people were either contacted on trips or at professional society meetings. Of these, 5 had observed objects or phenomena they could not readily explain. The feelings of the 44 astronomers toward the investigation of unidentified flying objects were as follows:

	% Total	Number
Completely Indifferent	6%	7
Mildly Indifferent	27%	12
Mildly Interested	40%	17
Very Interested	17%	8
	100%	44

Although the report is too lengthy to reproduce in total, an excerpt from the summary of the report is as follows:

"Over 40 astronomers were interviewed, of which five had made sightings of one sort or another. This is a higher percentage than among the populace at large. Perhaps this is to be expected, since astronomers do, after all, watch the skies. On the other hand, they will not likely be fooled by balloons, aircraft, and similiar objects, as may the general populace.

It is interesting to remark upon the attitude of the astronomers interviewed. The great majority were neither hostile nor overly interested; they gave one the general feeling that all flying saucer reports could be explained as misrepresentations of well-known objects and that there was nothing intrinsic in the situation to cause concern. I took the time to talk rather seriously with a few of them, and to acquaint them with the fact that some of the sightings were truly puzzling and not at all easily explainable. Their interest was almost immediately aroused, indicating that their general lethargy is due to lack of information on the subject. And certainly another contributing factor to their desire not to talk about these things is their overwhelming fear of publicity. One headline in the nation's papers to the effect that "Astronomer Sees Flying Saucer" would be enough to brand the astronomer as questionable among his colleagues. Since I was able to talk with the men in confidence, I was able to gather very much more of their inner thoughts on the subject than a reporter or an interrogator would have been able to do. Actual hostility is rare; concern with their own immediate scientific problems is too great. There seems to be no convenient method by which problems can be attacked, and most astronomers do not wish to become involved, not only because of the danger of publicity but because the data seems tenuous and unreliable."

III. PRESS CONFERENCE

On 29 Jul 52 a press conference was held in the Pentagon to answer the many questions that were being directed to the Air Force by the press. The conference was held by Major General John A. Samford, Director of Intelligence, USAF. Others participating were Major General Roger M. Ramey, Director of Operations, USAF, and officers of the Air Technical Intelligence Center.

In essence General Samford stated that to date there were no indications that any of the reported objects that could not be identified constitute a menace to the United States. However, the Air Force would continue to give the subject "adequate, but not frantic attention".

IV. PROPOSED THEORIES AS TO THE NATURE OF THE REPORTS

Several widely publicized theories as to the nature of the reported objects or phenomena have been advanced in recent months. These theories have been discussed with authorities on the subject of atmospheric physics and they have agreed that none of the theories so far proposed would account for more than a very small percentage of the reports, if any.

V. STATUS OF STATISTICAL ANALYSIS

In the spring of 1952 the Air Technical Intelligence Center established a project with a civilian contractor to make a statistical analysis of all incidents. As of 31 Oct 52, all reports for 1947, 1948, 1949, 1950, and 1951 had been reviewed and coded for IBM punch cards. By the end of October the data to date on 1952 incidents will be on punch cards ready for a preliminary analysis by statisticians.

When this is completed, the contractor will begin work on the coding of the 1952 reports. No completion date has been established for this phase. It is not contemplated that the 1952 reports will be completed in the near future, because, as was stated in Section I of this report, the total for the year of 1952 exceeds the total number of reports for all previous years.

VI. TECHNICAL INFORMATION SHEET

A questionnaire or technical information sheet to be filled out by observers making a visual sighting was completed in Oct 52. Preliminary work on this questionnaire began in May 52. A panel consisting of Blue Book personnel and several civilian scientists and engineers met and drafted a list of questions whose answers would be needed in evaluating reports. These questions were then given to a panel of psychologists who reworded them and made them into questionnaire form. Test samples of these questionnaires were reproduced and sent to persons reporting sightings. As test questionnaires were completed and returned by observers they were studied by the psychologists and others. Several such test questionnaires were developed before a final form was established. The final questionnaire is inclosed in this report as Appendix II.

These questionnaires are now being sent directly from ATIC to all persons making reports, if a mailing address is in the report. This includes both reports made by military in accordance with AFL 200-5 and reports made directly to ATIC by civilians.

VII. COOPERATION OF AIR DEFENSE COMMAND

Excellent cooperation has been received from the Air Defense Command in the utilization of their radar, fighter aircraft and the Ground Observer Corps.

ADC has directed all their radar sites that are equipped with operational radar scope cameras to keep these cameras on a 24-hour alert basis. It has been found that scope photos are an extremely valuable aid when it is necessary to evaluate reports of extremely high speed or unusual radar tracks.

A secondary duty of the Ground Observer Corps is the reporting of unidentified aerial phenomena or objects. This duty was established by ADC Regulation 55-31.

VIII. NAVY REPORTING REGULATION

On 26 Sep 52 the United States Navy published an OPNAV very similiar to AFL 200-5. This notice directs all naval units and installations to report sightings directly to Hq USAF, ATIC, ADC, and other agencies.

IX. BALLOON AND WEATHER DATA

In order to achieve more positive identification of unidentified flying objects, the Air Technical Intelligence Center has established channels of communication with the Air Weather Service, whereby the track of any weather balloon released by the USAF, US Navy, or Weather Bureau, within the continental limits of the United States or from US ships at sea and overseas bases, can be obtained. Basically the system works as follows: If the analyst at ATIC concludes, by reason of the description of a UFO, or the time and place of the sighting, that the UFO is possibly a weather balloon, he initiates and transmits to AWS a specific request for the tracks of all weather balloon releases at or near that time and place. Comparison of these tracks with the Flyobrpt frequently completes the analysis of the report.

Additionally, the US Navy and the USAF are currently engaged in the launching of special project upper air research balloons. These balloons are plastic polyethylene, a highly reflective surface, and since they often are on the order of one-hundred feet in diameter, they are visible to the naked eye under certain atmospheric conditions, even at extreme altitudes. Further, the loads carried are usually heavy and metallic, and electronic contact with these balloons can occur. In view of this situation, ATIC has, through the Ent Weather Central, Ent AFB, Colorado, taken steps to obtain the tracks of all such balloon releases, and these tracks have often resulted in positive identification of a UFO. To cite cases in point, the tracks of sixteen flights released in July by a US Navy contractor resulted in four positive, two probable, and four possible identifications of UFO's.

Another factor having a great deal of bearing in the analysis of a Flyobrpt, though it may not be the actual cause, is the meteorological condition of the atmosphere at the time and place of sighting. To obtain this data, the Air Technical Intelligence Center utilizes three sources. Firstly, when detailed information is needed immediately, it can often be obtained from the Base Weather Office at W-P AFB. Secondly, since ATIC receives daily RAOB's, constant pressure charts, surface charts and winds aloft charts, the necessary information is frequently on hand. Thirdly, when the data needed

is voluminous and complex, and time is relatively unimportant, the Air Technical Intelligence Center utilizes the records of the Air Weather Service in exactly the same manner as that employed in obtaining weather balloon release data.

X. CAMERAS

In an effort to obtain technical information concerning UFO's, ATIC has underway a program for the distribution of a large number of stereo cameras equipped with a diffraction grating over one lens. The camera in question is called the "Videon". It contains two F3.5 lenses with focal lengths of 45mm. As supplied by ATIC, the shutter speed and distance settings will be locked at 1/20th of a second and infinity, respectively. The "Videon" utilizes standard 35mm cartridge film, and is extremely simple to operate.

The diffraction grating actually consists of a thin cellulose compound which contains 15,000 vertical "hairlines" to the linear inch. It is mounted between two sheets of optical glass and placed over one lens of the Videon by means of a filter adapter ring. The grating operates on precisely the same principle as a prism; it separates a light into its component parts which will appear as well defined spectrum bands upon the film. Since each chemical element emits a wave of characteristic length, and the grating, so to speak, "picks up" these characteristics and shows them as significant bands on the film, comparative study of the film is expected to reveal much data concerning the chemical composition of a given UFO. The Videon camera, equipped as described above, does not represent the epitome of scientific equipment, however, actual comparison with other models has revealed that it offers a good probability for success in accomplishing the stated purpose, and this factor, along with the economy and availability factors, was responsible for ATIC's decision to purchase and distribute these cameras.

Simultaneously with the experimentation involving ground cameras, ATIC mounted diffraction gratings over the lenses of 16mm gun cameras of F-86 aircraft of the 97th Fighter-Interceptor Squadron, W-P AFB. These fighters then undertook air-air photography of known light sources, and the spectrums obtained were comparable to those obtained with the Videon; the smaller film surprisingly enough recorded equivalent definition and band separation. Therefore, as a part of the long range program, ATIC is considering the possibility of equipping certain USAF fighter-interceptor aircraft with diffraction gratings for air-air photographic coverage of UFO's.

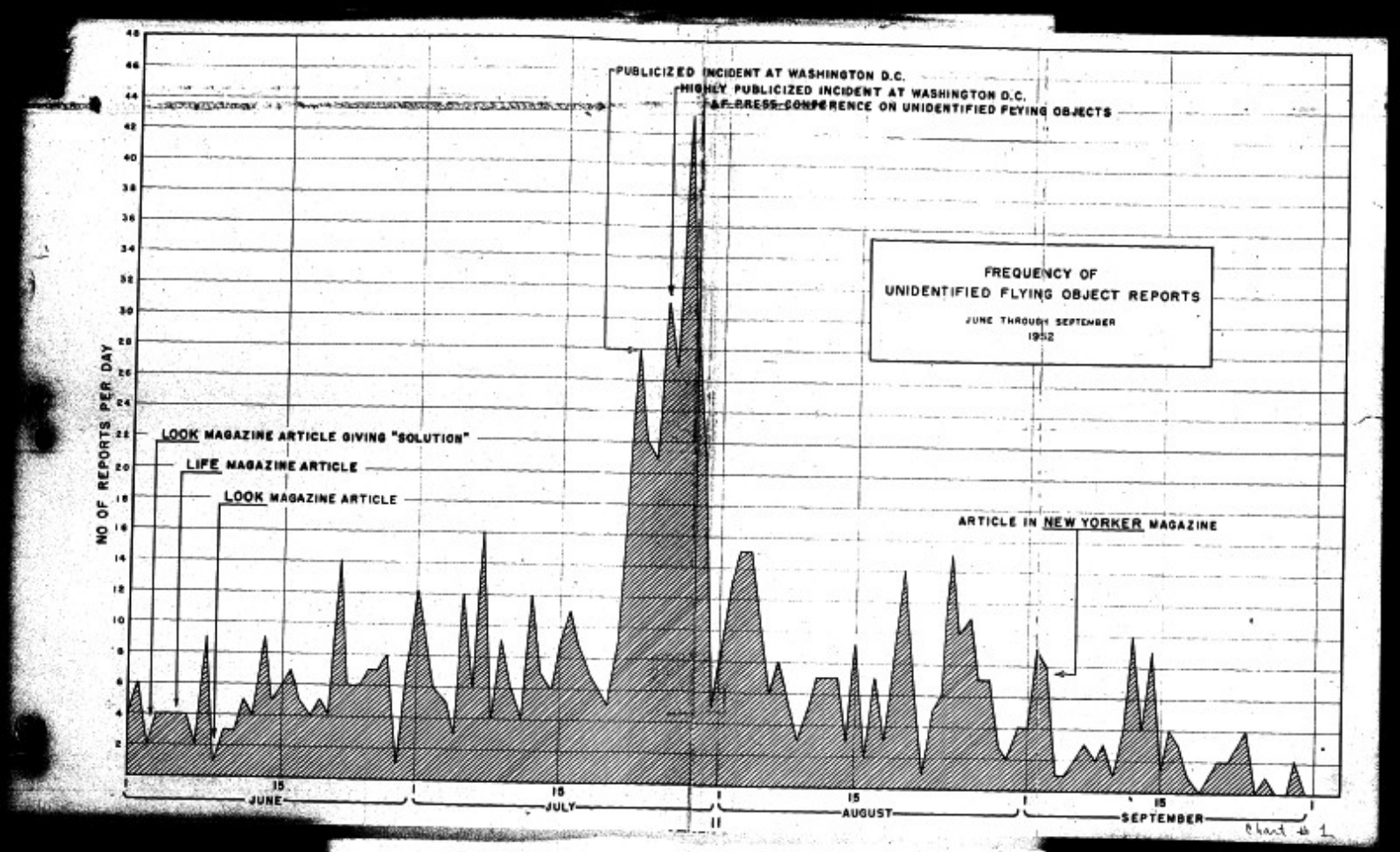
At present, ATIC is negotiating with Hq ADC, a plan for the placement of a certain number of Videon cameras with AC&W Squadrons. Similiarly, Videon cameras may be distributed to tower operators of AACS. Future plans allow for the procurement and placement of more Videon cameras and the placement of the diffraction grids in aircraft, however, these plans are entirely contingent upon the degree of success obtained in present operations.

XI. RECENT SIGHTINGS

Appendix III gives summaries of a few of the reports made to ATIC during the period covered by this report.

APPENDIX I

This chart shows the frequency of reports during the months of June, July, August, and September 1952. The dates of publication of several magazine articles and widely publicized incidents are noted on the chart.


PUBLICIZED INCIDENT AT WASHINGTON D.C.
HIGHLY PUBLICIZED INCIDENT AT WASHINGTON D.C.
&F. PRESS CONFERENCE ON UNIDENTIFIED FEYING OBJECTS
FREQUENCY OF
UNIDENTIFIED FLYING OBJECT REPORTS
JUNE THROUGH SEPTEMBER
1952
NO OF REPORTS PER DAY
LOOK MAGAZINE ARTICLE GIVING "SOLUTION"
LIFE MAGAZINE ARTICLE
LOOK MAGAZINE ARTICLE
ARTICLE IN NEW YORKER MAGAZINE
JUNE
JULY
AUGUST
SEPTEMBER
Chart # 1

Original

APPENDIX II

The final form of the questionnaire used for the interrogation of observers making visual sightings.

U. S. AIR FORCE TECHNICAL INFORMATION SHEET

This questionnaire has been prepared so that you can give the U. S. Air Force as much information as possible concerning the unidentified aerial phenomenon that you have observed. Please try to answer as many questions as you possibly can. The information that you give will be used for research purposes, and will be regarded as confidential material. Your name will not be used in connection with any statements, conclusions, or publications without your permission. We request this personal information so that, if it is deemed necessary, we may contact you for further details.

1. When did you see the object?

_____ Day _____ Month _____ Year

2. Time of day: _____ Hour _____ Minutes

(Circle One): A.M. or P.M.

3. Time zone:

(Circle One): a. Eastern
b. Central
c. Mountain
d. Pacific
e. Other _____

(Circle One): a. Daylight Saving
b. Standard

4. Where were you when you saw the object?

_____ Nearest Postal Address _____ City or Town _____ State or Country

Additional remarks: _____

5. Estimate how long you saw the object. _____ Hours _____ Minutes _____ Seconds

5.1 Circle one of the following to indicate how certain you are of your answer to Question 5.

a. Certain
b. Fairly certain
c. Not very sure
d. Just a guess

6. What was the condition of the sky?

(Circle One): a. Bright daylight
b. Dull daylight
c. Bright twilight
d. Just a trace of daylight
e. No trace of daylight
f. Don't remember

7. IF you saw the object during DAYLIGHT, TWILIGHT, or DAWN, where was the SUN located as you looked at the object?

(Circle One): a. In front of you
b. In back of you
c. To your right
d. To your left
e. Overhead
f. Don't remember

8. IF you saw the object at NIGHT, TWILIGHT, or DAWN, what did you notice concerning the STARS and MOON?

8.1 STARS *(Circle One)*:

a. None
b. A few
c. Many
d. Don't remember

8.2 MOON *(Circle One)*:

a. Bright moonlight
b. Dull moonlight
c. No moonlight — pitch dark
d. Don't remember

9. Was the object brighter than the background of the sky?

(Circle One): a. Yes b. No c. Don't remember

10. IF it was BRIGHTER THAN the sky background, was the brightness like that of an automobile headlight?:

(Circle One) a. A mile or more away (a distant car)?
b. Several blocks away?
c. A block away?
d. Several yards away?
e. Other _____

11. Did the object:

(Circle One for each question)

a. Appear to stand still at any time?	Yes	No	Don't Know
b. Suddenly speed up and rush away at any time?	Yes	No	Don't Know
c. Break up into parts or explode?	Yes	No	Don't Know
d. Give off smoke?	Yes	No	Don't Know
e. Change brightness?	Yes	No	Don't Know
f. Change shape?	Yes	No	Don't Know
g. Flicker, throb, or pulsate?	Yes	No	Don't Know

12. Did the object move behind something at anytime, particularly a cloud?

(Circle One): Yes No Don't Know. IF you answered YES, then tell what it moved behind: _____

13. Did the object move in front of something at anytime, particularly a cloud?

(Circle One): Yes No Don't Know. IF you answered YES, than tell what it moved in front of: _____

14. Did the object appear: *(Circle One)*: a. Solid? b. Transparent? c. Don't Know.

15. Did you observe the object through any of the following?

a. Eyeglasses	Yes	No	e. Binoculars	Yes	No
b. Sun glasses	Yes	No	f. Telescope	Yes	No
c. Windshield	Yes	No	g. Theodolite	Yes	No
d. Window glass	Yes	No	h. Other _____		

16. Tell in a few words the following things about the object.

a. Sound _____

b. Color _____

17. Draw a picture that will show the shape of the object or objects. Label and include in your sketch any details of the object that you saw such as wings, protrusions, etc., and especially exhaust trails or vapor trails. Place an arrow beside the drawing to show the direction the object was moving.

18. The edges of the object were:

(Circle One): a. Fuzzy or blurred
b. Like a bright star
c. Sharply outlined
d. Don't remember
e. Other _____

19. IF there was MORE THAN ONE object, then how many were there? _____
Draw a picture of how they were arranged, and put an arrow to show the direction that they were traveling.

20. Draw a picture that will show the motion that the object or objects made. Place an "A" at the beginning of the path, a "B" at the end of the path, and show any changes in direction during the course.

21. IF POSSIBLE, try to guess or estimate what the real size of the object was in its longest dimension. _____feet.

22. How large did the object or objects appear as compared with one of the following objects *held in the hand* and at about arm's length?

(Circle One):

a. Head of a pin
b. Pea
c. Dime
d. Nickel
e. Quarter
f. Half dollar
g. Silver dollar
h. Baseball
i. Grapefruit
j. Basketball
k. Other _____

22.1 *(Circle One of the following to indicate how certain you are of your answer to Question 22.*

a. Certain
b. Fairly certain
c. Not very sure
d. Uncertain

23. How did the object or objects disappear from view? _____

_____

_____

24. In order that you can give as clear a picture as possible of what you saw, we would like for you to imagine that you could construct the object that you saw. Of what type material would you make it? How large would it be, and what shape would it have? Describe in your own words a common object or objects which when placed up in the sky would give the same appearance as the object which you saw.

25. Where were you located when you saw the object? *(Circle One):*

a. Inside a building
b. In a car
c. Outdoors
d. In an airplane
e. At sea
f. Other _____

26. Were you *(Circle One)*

a. In the business section of a city?
b. In the residential section of a city?
c. In open countryside?
d. Flying near an airfield?
e. Flying over a city?
f. Flying over open country?
g. Other _____

27. What were you doing at the time you saw the object, and how did you happen to notice it?

_____

_____

_____.

28. IF you were MOVING IN AN AUTOMOBILE or other vehicle at the time, then complete the following questions:

28.1 What direction were you moving? *(Circle One)*

a. North
b. Northeast
c. East
d. Southeast
e. South
f. Southwest
g. West
h. Northwest

28.2 How fast were you moving? _____ miles per hour.

28.3 Did you stop at any time while you were looking at the object?
(Circle One) Yes No

29. What direction were you looking when you first saw the object? *(Circle One)*

a. North
b. Northeast
c. East
d. Southeast
e. South
f. Southwest
g. West
h. Northwest

30. What direction were you looking when you last saw the object? *(Circle One)*

a. North
b. Northeast
c. East
d. Southeast
e. South
f. Southwest
g. West
h. Northwest

31. If you are familiar with bearing terms (angular direction), try to estimate the number of degrees the object was from true North and also the number of degrees it was upward from the horizon (elevation).

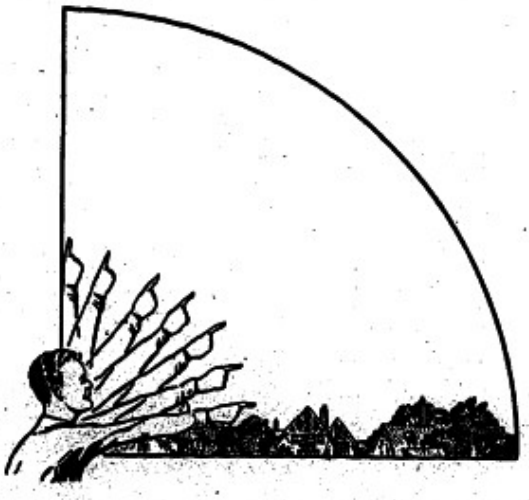
31.1 When it first appeared:

a. From true North _____ degrees.
b. From horizon _____ degrees.

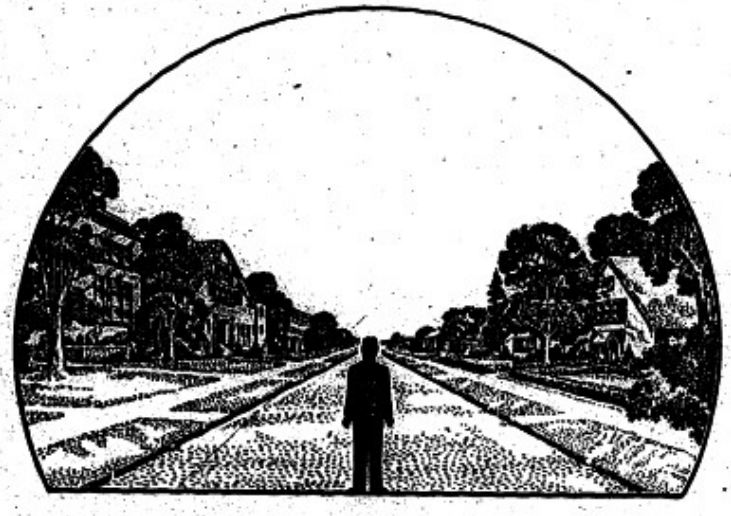
31.2 When it disappeared:

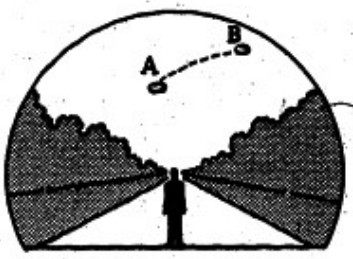
a. From true North _____ degrees.
b. From horizon _____ degrees.

32. In the following sketch, imagine that you are at the point shown. Place an "A" on the curved line to show how high the object was above the horizon (skyline) when you *first* saw it. Place a "B" on the *same* curved line to show how high the object was above the horizon (skyline) when you *last* saw it.



33. In the following larger sketch place an "A" at the position the object was when you *first* saw it, and a "B" at its position when you *last* saw it. Refer to smaller sketch as an example of how to complete the larger sketch.





34. What were the weather conditions at the time you saw the object?

34.1 CLOUDS *(Circle One)*

a. Clear sky
b. Hazy
c. Scattered clouds
d. Thick or heavy clouds
e. Don't remember

34.2 WIND *(Circle One)*

a. No wind
b. Slight breeze
c. Strong wind
d. Don't remember

34.3 WEATHER *(Circle One)*

a. Dry
b. Fog, mist, or light rain
c. Moderate or heavy rain
d. Snow
e. Don't remember

34.4 TEMPERATURE *(Circle One)*

a. Cold
b. Cool
c. Warm
d. Hot
e. Don't remember

35. When did you report to some official that you had seen the object?

_____ Day _____ Month _____ Year

36. Was anyone else with you at the time you saw the object?

(Circle One) Yes No

36.1 IF you answered YES, did they see the object too?

(Circle One) Yes No

36.2 Please list their names and addresses:

37. Was this the first time that you had seen an object or objects like this?

(Circle One) Yes No

37.1 IF you answered NO, then when, where, and under what circumstances did you see other ones?

38. In your opinion what do you think the object was and what might have caused it?

39. Do you think you can estimate the *speed* of the object?

(Circle One) Yes No

IF you answered YES, then what speed would you estimate? _____ m.p.h.

40. Do you think you can estimate how far away from you the object was?

(Circle One) Yes No

IF you answered YES, then how far away would you say it was? _____ feet.

41. Please give the following information about yourself:

NAME _____ (Last Name) _____ (First Name) _____ (Middle Name)

ADDRESS _____ (Street) _____ (City) _____ (Zone) _____ (State)

TELEPHONE NUMBER _____

What is your present job? _____

Age _____ Sex _____

Please indicate any special educational training that you have had.

a. Grade school _____
b. High school _____
c. College _____
d. Post graduate _____
e. e. Technical school _____
(Type) _____
f. Other special training _____
_____

42. Date you completed this questionnaire: _____ (Day) _____ (Month) _____ (Year)

U. S. AIR FORCE TECHNICAL INFORMATION SHEET

(SUMMARY DATA)

In order that your information may be filed and coded as accurately as possible, please use the following space to write out a short description of the event that you observed. You may repeat information that you have already given in the questionnaire, and add any further comments, statements, or sketches that you believe are important. Try to present the details of the observation in the order in which they occurred. Additional pages of the same size paper may be attached if they are needed.

NAME _____
(Please Print)

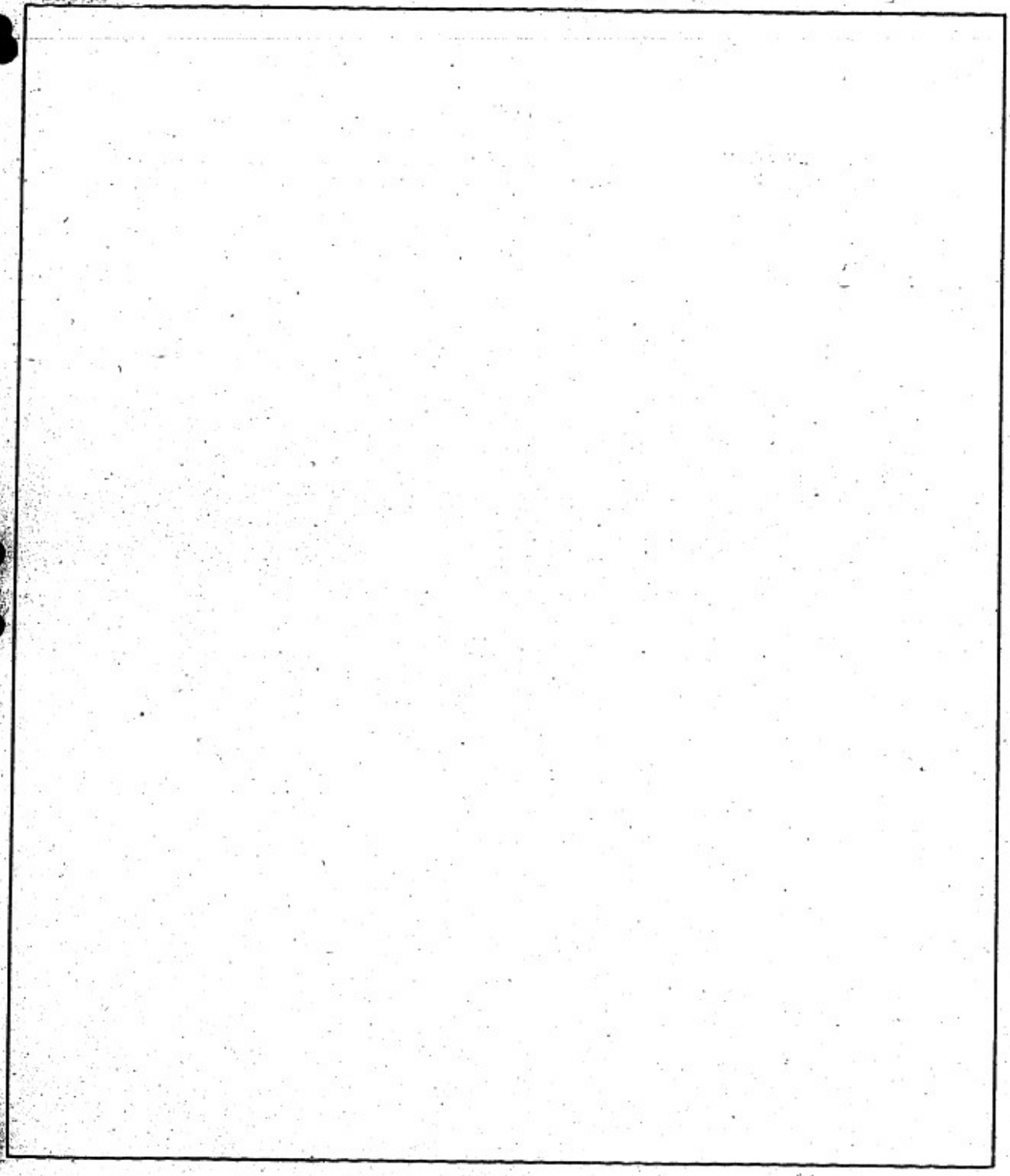
SIGNATURE _____

DATE _____

(Do Not Write in This Space)

CODE:

USAFTIS



APPENDIX III

This appendix contains resumes of several of the more significant incidents that were reported to ATIC during the period covered in this report.

13 May 1952 Greenville, South Carolina

Description of Incident

On the night of 13 May 1952 at 2233 EST, four amateur astronomers observed a diamond formation of four oval-shaped objects. The objects were observed visually from the ground. The objects were sighted nearly overhead and disappeared at an angle of about 12° in three seconds. They were described as being reddish-yellow or reddish-brown in color. They were relative in size to a half dollar, quarter turned, at arm's length. The objects appeared to wobble in their flight and being oval-shaped appeared to be flying sideways.

The night was extremely clear. The sources stated that there was haze and ground illumination near the city, but that they were on the Furman University campus and that there were no ground lights near nor haze.

One observer was inclined to believe these were geese.

Comments

The description of this incident is very similiar to others from drive-in theaters and one from Fargo, North Dakota, on 25 April 1952, that were ducks. In this case, however, there were no ground lights in the area to reflect from a bird. This is borne out by the fact that these people had set up their telescopes in a dark area, which is essential for good astronomical observing.

It is not known how much light a bird will reflect, but it seems logical that a relatively bright ground source of light would be needed.

As was stated, one source was sure they were geese but the other three were just as sure they were not.

The possibility of aircraft is nil since they passed directly overhead with no sound.

Conclusion

Unknown

18 July 1952 Patrick AFB, Florida

Description of Incident

At approximately 2245 EST on 18 July 1952 seven people, three officers and four airmen, observed a series of unidentified lights near Patrick AFB, Florida. The lights were described as being much brighter than a star and amber-red in color and similiar to a star. The first light was observed at a 45° angle of elevation west of the air base. It remained stationary for approximately one minute, then began to slowly move north. It stopped, then moved south at a slow speed. While observing the first light, a similiar light was observed about 20° below the first light and moving north at a much higher speed.

As the first light continued to move south, a third light was seen over the base traveling in a westerly direction at high speed. Before this light had faded in the distance, a fourth light was observed following the same path as the third. At this time, all the lights except number four had disappeared.

A fifth light appeared in the west and came directly over the airfield where it appeared to make a gradual 180° left turn and head toward the west until it faded from view. This light appeared coming over the base and disappeared in 15 seconds.

Comments

An attempt was made to pick up the object on APQ-13 radar, but the attempt was unsuccessful. It should be noted that APQ-13 is not a search radar, consequently, the fact it could not make contact is not significant.

A balloon was in the area but the balloon was tracked continuously and drifted west of the air base. At no time was it over the observers. It is possible that a balloon could drift into the area from another location, but the number of reported lights, their motion and the winds aloft do not substantiate this theory.

Air traffic was checked and there were no aircraft in the area.

Conclusion

Unknown

29 July 1952 Port Huron, Michigan

Description of Incident

On the night of 29 July 1952 an AC&W Station in Michigan observed an unidentified return on the scope. The time was shortly before 2140 CST. The target was plotted at 550 knots on a 360° heading for 20 minutes.

Three F-94B aircraft were in the area making practice runs on a B-25. One of these aircraft was requested by GCI to investigate the unknown target. The aircraft climbed out of the practice area on a heading of 270° to 20,000'. GCI called and requested a visual search to be made at 3 o'clock. A turn to 3 o'clock was started when the radar operator got a lock-on from a target at 2:30 o'clock level, four miles away. The lock-on was held for only 30 seconds. As the turn was made, a bright, flashing, colored light was observed by the pilot. He turned into the light on a heading of 360° and followed it for twenty minutes at an IAS of 350 knots at 21,000 ft. The light remained between 12 and 1 o'clock. At the time of the lock-on, the aircraft was 20 miles west of Port Huron, Michigan.

The GCI radar was carrying both the unidentified target and the F-94 on the scope. Since the F-94 could not close, it was assumed by GCI that the object increased its speed to that of the F-94.

Comments

Two other F-94 aircraft were airborne, but they continued making practice runs on a B-25 and were not in the area at the time of the sighting.

The star, Capella, is directly in line with the F-94's line of flight and the aircraft would have been flying straight toward it. It is very low on the horizon and appears to be flashing green, blue, red, etc. At first it was believed that this is what the pilot saw, but when it was established that both the F-94 and the UFO were being carried on the GCI scope, Capella becomes a doubtful suspect.

It could be that this is a series of coincident weather phenomena affecting the radar equipment and sightings of Capella, but this is stretching probabilities too far.

A balloon can be disregarded since the speeds are too high for even a jet stream.

Three weak inversions were noted below 10,000'.

Conclusions

Unknown

29 July 1952 Los Alamos, New Mexico

Description of Incident

At approximately 0949 MST on 29 July 1952, several pilots and guards from Los Alamos observed an UFO. The object was flying straight and level at high speed north of the Los Alamos landing field. The object, which was a shiny metallic color, was observed for 30 minutes with binoculars.

Fighters in the Los Alamos area were diverted to the area of the sighting and visually vectored toward the object. The object disappeared but reappeared in front of the fighters, made a 360° turn, came around in back of the fighters, followed for two minutes and disappeared. The fighters did not observe the object. The aircraft which were at 40,000' left vapor trails, but the object did not.

The only other aircraft in the area left Los Alamos at 0950 MST and headed directly south.

Comments

The report states the object was flying at high speed straight and level, yet it was in sight for 30 minutes. The object could not have been traveling too fast, or it would have gone out of the area within the 30 minutes it was observed.

If the aircraft were high and the object was a drifting balloon at low altitude, the balloon would appear to stay ahead of the aircraft for a short period of time. A balloon would not make a 360° turn, however.

The report is incomplete, no Form 112 was submitted, and the data in the wire is sketchy.

Conclusion

Although there is hardly enough data to evaluate the report, it will be classed as unknown.

29 July 1952 Albuquerque, New Mexico

Description of Incident

At approximately 2230 MST on 29 July 1952, the source, an employee of the Los Alamos Laboratory (also a Reserve Lt Colonel, four-engine pilot with 1500 hours) observed an UFO from his home in Albuquerque, New Mexico. The bearing of the object from his position was 225° and the elevation was 20° to 25° above the horizon.

The object was described as a "fattened ellipse". The color was a dull yellow. Light rays the same color as the image and approximately half the length of the horizontal axis appeared to be emanating from the object in all directions. They were not pulsating, but steady. After about 45-60 seconds, it began to shrink in size rapidly. Within 15 seconds, it disappeared. It did not change in elevation or azimuth. The color changed from a pale yellow to a yellowish-white to clear white as it disappeared. There was no sound. The angular length of the horizontal axis was about 4°.

The ceilometer at Kirtland AFB was on and the object was near it. The source was definite that this was not what he saw as he located the ceilometer beam and the moon.

Comments

This occurred two hours and thirty minutes after a balloon launch, so it is doubtful that it was a balloon. As was noted before, the source definitely saw the moon and the ceilometer beam.

There is a possibility that some atmospheric condition caused the ceilometer beam to split. This is doubtful, however, because the elevation of the object was different. If the cloud base was at a constant level, the difference in elevation would indicate that the object or spot on the cloud bases would be farther away from the observer than the ceilometer.

It is possible that the source saw another ceilometer or a searchlight. This is doubtful, however, since the area, past Kirtland, in the direction the source was looking, is nearly uninhabited. In addition, a searchlight beam would either move or go out faster. When a searchlight is turned off, there is a period in which the image on a cloud would dim out due to cooling of the electrodes but this does not require 15 seconds.

All in all, the report is excellent, one of the few where the source was thoughtful enough to measure angles and make careful observations.

Conclusion

Unknown

1 August 1952 Bellefontaine, Ohio

Description of Incident

At 1551Z, a radar track appeared 20 miles NNW of W-P AFB. The course was 240° at 400 knots. Two F-86's under GCI control were then located ten miles SW of that position. The fighters were vectored and made visual contact at 1555Z. Fighters stayed with the object until 1613Z.

Interrogation of sources, an AF major and lieutenant, reveal the following:

a. The F-86's climbed to 48,000', fell off, and then made a second climb to 48,000'. The major made a camera run the second time and received a weak return on his radar gunsight. The lieutenant's sight was "caged" so he received no return. The major estimated the object at 12,000-20,000' above his altitude of 48,000'. This estimate was substantiated by the range capability of the radar gunsight. The object's size, accepting source's estimate of distance, was 24-40' in diameter and source said his optical sight just covered the object. The films were not sufficiently clear. The object appeared as a fuzzy, small image in the upper right hand corner with discernable motion to lower left.

b. The AC&W Squadron established two important facts: Re-affirmation that the UFO moved at 400 knots and indication that the two F-86's and UFO appeared simultaneously on the GCI scope. It is obvious that all eyes and antennas were fixed on the same object.

Comments

The object was not a balloon, since the speed was too fast. A rawinsonde was released at 1500Z and moved off to the east. The object moved against the wind. The blip size was that of a normal aircraft. The object was not a known aircraft because the altitude was too high. The object was not astronomical as dual radar returns eliminate this. Electronic or visual mirage of meteorological phenomenon is out of the question as the radar set was on high beam, and both would not occur simultaneously in the same place. The sighting occurred "above the weather".

Conclusion

Unknown

3 August 1952 Truth or Consequences, New Mexico

Description of Incident

On 3 August 1952, the source, a civilian engineer, observed three motionless cylindrical objects from the town of Truth or Consequences, New Mexico. The objects were in an inverted "V" formation at about 45° elevation. Their angular length was the span of two widths of the little finger at arm's length and the depth was 1/8" at arm's length. They were light green in color. At one time, one object shifted its position to form an echelon formation. This movement was smooth not erratic. As it moved, it seemed to roll on its longitudinal axis. The apparently disappeared by rising at a rapid rate.

The total time of observation was 9 minutes.

Comments

The object was seen in the direction of the local airport which has a rotating beacon. Since they were motionless, except for movement within the group, it is extremely doubtful that it was the beacon since the beacon was rotating. In addition, the elevation was 45°.

The size, which the source seemed to be sure of, would eliminate aircraft. Any aircraft appearing as large as source describes would be heard.

Light phenomenon such as diffraction or reflection is unlikely since some of the objects remained stationary while one shifted position.

Unfortunately, there was only one source so too much weight cannot be put on the report.

Conclusion

Unknown

5 August 1952 Haneda AFB, Japan

Description of Incident

The object was first noticed by two airmen walking across the ramp at Haneda AFB on the night of 5 Aug 52 at 2330I (local time). The airmen were on their way to the tower to relieve the operators. On reporting to the tower, the object was called to the attention of the tower operators who were going off duty.

The four operators agreed that the object, which they observed for from 50 minutes to an hour through 7x50 binoculars, was circular in shape and with constant brilliance. The light appeared to be a portion of a large, round, dark shape which was about four times the diameter of the light. When the object was close enough for details to be seen, a smaller, less brilliant light could be seen along the lower edge of the dark shape. The object faded to the east twice but reappeared; it could have faded or actually gone away and come back. The size of the light, when closest to the tower, was approximately the same as the ceiling balloons that are released near the tower. A comparison was made to these 24" diameter balloons at 2000'. This would make the object 50' in diameter at 10 miles. During the observation, a lighted balloon was released but this light was extremely dim and yellow compared to the object.

An airborne C-54 was requested to check the object, which the pilot did, but he reported seeing only a star.

An AC&W unit was notified soon after the original visual sighting and shortly after 2345I picked up an unidentified return. The object was tracked at varying speeds from hovering to 300 knots. At 0012I the return "broke into three pieces" and they maintained intervals of 1/4 mile. No visual observation was made from the AC&W unit although it was attempted and, at one time, the object was within 10 miles of the station. The radar was directed onto the target by visual observations from the tower, so it can safely be assumed that both visual and radar contacts involved the same object.

At 0003I an F-94 was airborne on a scramble and was requested to search to the NE of Haneda AFB over Tokyo Bay. They could make no visual observations, but could see the North Star and Venus. The F-94 was vectored to the object by GCI (both the F-94 and object were on the scope) and held for 90 seconds. Shortly after this, both the object and the F-94 disappeared into the ground clutter on the GCI. At no time did the F-94 make visual contact. The radar contact indicated the target was at 6000 yards, 10° below and 10° to the right of a 320° bearing from the station.

Soon after loss of radar contact, the object was lost visually.

Comments

The F-94 crew reported excellent visibility, yet they could not visually observe the object during a thorough search of the area. They stated that the moon was bright and might possibly have caused reflections off the few scattered clouds. This, however, is not in agreement with the description of an exceptionally bright light given by the tower operators.

Since the weather was not given, it is not possible to determine whether the radar return was caused by some type of anomalous propagation.

Conclusion

Unknown

26 September 1952 Azores Islands

Description of Incident

At approximately 0116Z (2316 local time), a C-124 enroute from Harmon AFB, Newfoundland, to the Azores on a MH of 135°, TAS of 200 mph, and altitude of 9000', observed two distinct green lights 15° forward of the right wing and slightly above. The C-124 was at 41°00'N-35°00'W at the time. The lights were observed by the pilot, co-pilot, engineer, and aircraft commander. The lights remained off the right wing and appeared to alternate leading each other. At one time, the lights appeared to turn toward the C-124. The lights were visible until the aircraft sighted the Azores.

All other known aircraft in the area were checked with the tower and asked to blink their lights. Each aircraft was either located or it was established that they were too far away to be seen. Surface vessels were also checked but none were in the area.

The weather was CAVU.

Comments

The only possible explanation is another aircraft or some light phenomenon. The possibility of other aircraft is slight because no aircraft came in to land behind the C-124 and very few aircraft overfly the Azores. In addition, all aircraft flying in that area keep their position known to the Air Force so they can be aided in an emergency. The only other possible aircraft would be unfriendly and again this is doubtful.

Light phenomenon is possible since the right wing carries a green light, the "reflection off a vertical inversion" could have been the cause. However, since there are no data on this proposed phenomenon the sighting cannot be attributed to this.

Conclusion

Unknown

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STATUS REPORT

PROJECT BLUE BOOK - REPORT NO 9

FORMERLY PROJECT GRUDGE

PROJECT NO. 10073

31 JANUARY 1953

AIR TECHNICAL INTELLIGENCE CENTER
WRIGHT-PATTERSON AIR FORCE BASE
OHIO

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This report is the ninth of a series of monthly status reports of Project Blue Book. Normally each report is written on or near the last of each month and contains a summary of all incidents reported during the month covered by the report.

Any additional information may be obtained on any incident by directing requests to Commanding General, Air Technical Intelligence Center, ATTN: ATIAE-5, Wright-Patterson Air Force Base, Ohio.

STATUS OF PROJECT BLUE BOOK

I. OVERALL STATUS

A. General

During the period 1 November 1952 to 30 November 1952 a total of 27 reports were received through AF channels. This total represents a decrease of 13 from the October 1952 total of 40 reports.

Time not being spent on the actual evaluation of reports is being devoted to cataloging and reviewing reports received during the summer of 1952. At the time many of these reports were received, the workload was of such a degree that they were given only quick preliminary screening.

All reports received during 1952 are being cross-indexed. The cross-indexing of all reports up to 31 December 1951 was accomplished in March 1952. The categories for cross-indexing are:

1. Date
2. Location
3. Type of Observation (i.e., visual, electronic, etc.)
4. Conclusion

B. Briefing Given to Personnel of the Los Alamos Scientific Laboratory

On 23 October 1952, Col D. L. Bower and Capt E. J. Ruppelt presented a briefing on Project Blue Book to a group of 400 scientists, engineers, and technicians at the Los Alamos Scientific Laboratory. The briefing consisted of a brief history of the project, details of the present operations, and several recent sightings. Approximately an hour and a half was devoted to a question and answer period following the presentation of the briefing.

After the briefing, the balance of the day was devoted to a meeting with a group of people from the Laboratory who have shown a great deal of interest in the subject of Unidentified Flying Objects.

C. Briefing Given to the OSI District Commanders Meeting

The Office of Special Investigations District Commanders Meeting was briefed at Kelly AFB, Texas, on 27 October 1952. Personnel from the Current Estimate Branch of D/I, Hq USAF and ATIC presented the briefing which stressed collection, analysis methods, and current situation.

D. Proposed Changes in Air Force Letter 200-5

A proposal for changing certain sections of Air Force Letter 200-5 has been written and forwarded to the Director of Intelligence. The major proposed change in the directive is to eliminate the presently required written Air Force Form 112 and to add several items to the required wire message.

If a written report is necessary in addition to the wire, it will be specifically requested by ATIC.

It is believed that by eliminating the written report, a great many manhours can be saved on an Air Force-wide basis. In some instances, the Form 112 has merely been a repeat of the wire.

E. Status of Videon Camera

Letters have been prepared and sent to Air Defense Command and Aircraft and Air Communications Services (AACS) to obtain concurrence on the current plan to place cameras in control towers and at certain selected radar sites.

F. Contractor Status

1. Analysis of Existing Sighting Reports

Sighting reports dated up to and including June 1952 have been processed. Except for the reports dated 1947 and 1948, all sighting reports up to and including March 1952 have been evaluated. The sighting reports for 1947 and 1948 are not available for evaluation. As soon as the 1947 and 1948 reports are available and can be evaluated, all sighting reports for the years 1947 to 1951 will be ready as a group for preliminary analysis utilizing IBM equipment.

Sighting reports for the month of July 1952 have been received. Because there are 450 sighting reports for July, processing them will not be completed until the first week in December. Evaluation of reports for the months of April, May, June, and July 1952 will require about six days of conference time. Conferences for the evaluation of sighting reports will be arranged as reports become processed in groups of 200. Each group of reports will require about two days of work for a cooperating researcher Blue Book evaluation team.

The evaluation of 1952 reports will be more time consuming than was the case for earlier reports, because reports now are in more detail and often consist of sightings of one object by more than one individual.

Since October 16, 1952, it has been necessary to establish a rotation system for handling sighting reports, no more than 100 sighting reports being permitted away from Blue Book at any one time. Questionnaires and work sheets completed here must therefore be put in duplicate folders before sighting reports matching these questionnaires and work sheets are returned to WPAFB in return for unprocessed sighting reports. When evaluation conferences are held, these folders must be matched before an evaluation is made. The necessity for establishing a rotation system has caused some delay in progress.

2. Analysis of Soil and Vegetation Samples

Two samples of vegetation and soil from Pittsburgh, Kansas, which were submitted by Blue Book for analysis, have been thoroughly studied. Examination by experts on soil and vegetation disclosed no difference between the two samples from the two areas where the specimens were obtained. Tests for radioactivity likewise showed no significant difference between the two samples of soil and vegetation. Tests were made for beta, gamma, and alpha radiation. Samples of the "Kansas" soil and the vegetation will be returned to Blue Book in the near future.

3. Consultant on Astronomy

Dr. J. Allen Hynek, of the Ohio State University, attended the Boston meeting of the Optical Society of America on 11 October 1952. The Society took cognizance this year of the many reports of unusual aerial phenomena by including three invited papers on the subject in their otherwise straightforward scientific meeting. One of the invited papers was by Dr. J. Allen Hynek, entitled "Unusual Aerial Phenomena". The other two papers were by Drs. Menzel and Liddell, of Harvard Observatory and the Atomic Energy Commission, respectively.

The papers of Menzel and Liddell, though differing somewhat in content, were identical in spirit. Both papers were characterized by the fact that numerous explanations for unexplained sightings were given without a single reference to a specific sighting in the files of the Air Technical Intelligence Center. Both papers presented a series of well-worn statements as to how jet fighters, meteors, reflections from balloons and aircraft, and optical effects, such as sundogs and mirages, could give rise to "flying saucer" reports. Since there was nothing new in either of the two papers, the trip from this standpoint was unproductive.

The paper by Dr. Hynek, in essence, was to the effect that flying saucers represented a science-public relations problem; i.e., when a sighting is made by several people, at least one of whom is an experienced observer, the mutually corroborated reports are entitled to a scientific hearing, rather than ridicule. It stressed the point that here was a subject in which the public has shown great interest. It was recommended that the relatively few well-screened reports be dealt with specifically to see whether any of the causes suggested by Drs. Liddell and Menzel are applicable, and, if so, to make this known in these specific instances. On the other hand, if the suggested explanations of Drs. Liddell and Menzel do not explain well-screened cases, this should also be made known and given further scientific study.

In conclusion, it was the opinion of Dr. Hynek that little was gained by attendance at the meeting. The results were negative in the sense that it was confirmed, as Dr. Hynek already believed, that Drs. Liddell and Menzel had not studied the literature and the evidence and, hence, were not qualified to speak with authority on the subject of recent sightings of unidentified aerial phenomena.

An attempt to arrange a meeting by Dr. Hynek with Dr. Menzel and Dr. Liddell, after the meeting was over, was unsuccessful because Liddell and Menzel both had to leave immediately after the meeting.

4. Interrogation Forms

Five hundred copies of the "U.S. Air Force Technical Information Sheet" (Form A and Form B) were delivered to W-P AFB on 20 October 1952. This questionnaire was used in place of the "Tentative Observers Data Sheet" to record data on all sighting reports dated after 31 March 1952. It has proved to be more satisfactory than the previous form, especially from the standpoint of recording data from sighting reports in greater detail.

Additional copies of the "U.S. Air Force Technical Information Sheet" can be supplied to Blue Book as needed.

5. Future Work

Coding and evaluation of 1952 sighting reports will continue. A preliminary analysis of data on all sighting reports dated previous to 1952 will be given to Blue Book as soon as possible after evaluation is completed of the 1947 and 1948 sighting reports.

By 10 December 1952 all sighting reports dated before 15 June 1952 should be processed and evaluated ready for IBM analysis. Complete IBM analysis of all sighting reports will not be started until all reports dated previous to 1953 are processed and evaluated. Because of the nature of the work required, and the fact that the number of reports for the last three months of 1952 is not yet known, no estimate can be given as to the time final IBM analysis will begin. It is hoped, if the frequency of sighting reports follows the present decreasing trend, that complete IBM analysis for sightings dated through 1952 may be started by 1 February 1953.

II. RECENT REPORTS

The following reports are summaries of reports that were received during the month of November 1952.

Friona, Texas November 1952

I. Description of Incident

Source supposedly picked up pieces of an exploded "flying saucer" and sold half the pieces to the Soviet Embassy. He had previously notified the Pentagon, but hadn't heard from them so he sold out to the Soviets.

II. Discussion of Incident

It is believed that this is a "crackpot" report. The original report was made to the F.B.I. and forwarded to ATIC.

III. Conclusion

Hoax

Laredo, Texas 3 November 1952

I. Description of Incident

At 1829 CST on 3 November 1952, two control tower operators at Laredo AFB, Texas, observed a long, elliptical, whitish-grey object approach the AFB from the SE. It appeared to pause south of the base then depart to the SE with an apparent burst of speed. The object was in view from 3 to 4 seconds. No tail or trail was noted.

A T-33 aircraft was in the area but was in sight during the observation.

The weather was given as two layers of scattered and broken clouds at 5,000' and 10,000', visibility 12 miles. Wind at surface was NNE at 10 knots.

II. Discussion of Incident

The apparent high speed and length of time in view eliminate the possibility of a balloon or aircraft. Many aspects of this sighting are similar to the description of a meteor. If, however, the object came toward the tower (i.e., from the report it apparently appeared to get larger) then went away, it could not have been a meteor; but since the flight path of an object not going directly overhead is hard to judge, this approach and retreat might be an illusion.

III. Conclusion

Possibly astronomical.

Vineland, New Jersey 4 November 1952

I. Description of Incident

On 4 November 1952 a civilian woman noticed two groups of two or three objects moving in a SE direction at a slow speed. The observation lasted 30 seconds and took place at 1730 EST. The objects were approximately 40° above the horizon with the observer looking S and appeared to be whirling like a lighted wheel.

II. Discussion of Incident

The source states that there were scattered clouds in an unusual formation and that she first noticed the objects between two banks of clouds. There is a slight possibility that the incident was caused by the afternoon sun reflecting off this cloud formation thereby causing a strange effect, but there is no way to substantiate this explanation.

However, the report is so sketchy and incomplete that there is insufficient factual data for an evaluation. Added to this is the fact that only one rather inexperienced source observed the phenomenon.

III. Conclusion

Insufficient data.

Caribou, Maine 4 November 1952

I. Description of Incident

On 4 November 1952 a slow-moving light of varying colors was observed by both airborne and ground observers for a period of four hours from 1730 EST to 2130 EST. It was described by all observers as first stationary and then sinking down below the horizon. The colors were white, red, orange and blue-green.

The object was first sighted by an Air Force captain and 1st Lt flying at 2,500' on a heading of 360° in a T-6 a/c. The light appeared at a 7 o'clock position, elevation approximately 25°. Presque Isle AFB was contacted and several ground observations were made by the senior control tower operator from that base.

II. Discussion of Incident

An incoming Northeast Airlines flight at Presque Isle also sighted an object in the same relative position with many changing colors. The pilot stated that he thought it was a star. After thinking the sighting over, the crew of the T-6 as well as the control tower operator also came to this conclusion. It is true that a star or planet's light under certain haze conditions will refract and change color. The disappearance of the object below the horizon can be attributed to the normal rotation of the earth.

III. Conclusion

Probably a bright star or planet.

Erding Air Depot, Germany 4 November 1952

I. Description of Incident

Three airmen observed an object described as being dark and oval-shaped. It appeared to be tumbling end-over-end as it traveled eastward at a low speed. Object appeared to be low. The time of the sighting was 1500Z.

Weather at the time of the sighting was scattered clouds at 2,500' and an overcast at 4,500'. Winds at 1,000' were from 310° at 10 knots and at 5,000' winds were from 300° at 6 knots.

II. Discussion of Incident

If balloons are launched at 1500Z in Germany as they are in the U.S., this could very well be a balloon. The observers say it was traveling East which is with the wind.

III. Conclusion

Probably a balloon launched from the air depot.

Auburn, Alabama 7 November 1952

I. Description of Incident

Civilian source reported observing a bright, circular object, stationary in the sky east of Auburn, Alabama, at 1645 CST on 7 November 1952.

Weather at the time of the sighting was scattered clouds at 12,000', broken clouds at 25,000'. Visibility 4 miles due to smoke.

Source stated object looked like a star.

II. Discussion of Incident

It is possible that the object observed was a star. At 1645 CST it is dark enough to see the brighter stars. Sunset was at 1645 CST.

III. Conclusions

Probably a star.

Auburn, Alabama - Columbus, Georgia 8 November 1952

I. Description of Incident

At approximately 1715 EST on 8 November 1952 many people in the Columbus, Georgia, and Auburn, Alabama, area observed a silver colored spherical or oval shaped object. The outer edge was described as translucent and emitting a green light. There were two bright spots on the object.

II. Discussion of Incident

Many of the sources who observed the object stated that it was a balloon. Some made observations through telescopes.

III. Conclusions

Probably a balloon.

El Vado, New Mexico 9 November 1952

I. Description of Incident

At 0105Z on 9 November 1952, a radar at El Vado, New Mexico, first observed a "blip" 20° wide, 45 miles and 145° from the station. The "blip" was clocked at from 600 to 1400 mph as it went off the scope at 130 miles. It soon returned on the same azimuth, came to within 65 miles of the station, hovered approximately two minutes, turned, and went off the scope again. It was observed a total of ten minutes.

During the sighting, the frequency of the radar set was changed 20 megacycles with no apparent change in the target.

II. Discussion of Incident

Many similar types of returns have been shown to be due to certain atmospheric conditions. It is very possible that this return was due to weather.

III. Conclusion

Weather caused the unusual radar return.

Covington, Ohio 10 November 1952

I. Description of Incident

At 1700 EST a civilian phoned the ATIC duty officer to report that he was observing a brilliant bluish light in the sky N of his home.

II. Discussion of Incident

Patterson operations, W-P AFB, advised the duty officer that a B-29 was testing photo flash equipment in the area.

III. Conclusion

Was aircraft.

Washington, D.C. 10 November 1952

I. Description of Incident

Civilian sources reported that they used 8-power binoculars to observe two lights that appeared to be east of Washington National Airport. The lights were observed at 2150 EST on 10 November 1952 for a period of one hour. There was no apparent movement but they grew alternately brighter and dimmer. The lights were close enough together to be included in the field of view of the binoculars.

Weather reported to be 0-0 at Bolling AFB at 2200 EST but source stated there was no fog where he was.

II. Discussion of Incident.

The data in the report is too sketchy for a complete evaluation, but it is possible two exceptionally bright stars were observed.

III. Conclusion

Possibly astronomical.

Lott, Texas 11 November 1952

I. Description of Incident

Two civilian men reported observing two objects at 1540 CST on 11 November 1952. The objects were described as being non-metallic in appearance, globe-shaped, and of a cloud grey color. The two objects appeared to be connected by a "wispy, cloud-like" band. The objects appeared at a 75° elevation, 20° azimuth, moving in a general ESE direction to about 95° azimuth; it then turned NNE.

The weather was clear with winds from the WNW of 15 knots at 19,000' and 35 knots at 39,000'.

II. Discussion of Incident

Source is known to be very enthusiastic about this subject, he has made four sightings.

A balloon was released from the James Connally AFB at Waco, Texas, at 1500 CST. The winds at 39,000' were from the WNW and according to source's description, the object was traveling approximately with the wind. Lott, Texas, is about 30 miles SSE of Waco and with 35 knot winds, the balloon could be in view at Lott 40 minutes after the scheduled launch. No data on the length of time observed is given.

III. Conclusion

Probably a balloon.

Chatham, England - Dover, England 11 November 1952

I. Description of Incident

At 1615Z (local time) on 11 November 1952, approximately 40 civilians observed an object which they reported first to be oval-shaped then changing to a conical shape, then changing back to an oval shape. It disappeared in a bright flash. The color and apparent size and speed was not reported. There was no sound. The observers were located at 51°26'N-00°45'E. The object was observed to the SE and was seen several times over a five-minute period.

At 1620Z on the same day, a police sergeant and 20 police recruits observed an object described as a slowly moving small oval "nucleus" (i.e., body) brilliant reddish-white, and with a long fiery tail ten times the diameter of the main body. The observers were located at 51°05'N-01°10'E. It was first seen on the western horizon, moving to the north. The object disappeared into a heavy stratus cloud layer after being observed for ten minutes.

II. Discussion of Incident

A plot shows that the police that made the observation were 24 miles south and 29 miles west of the civilians. The civilians reported making their observation to the SE and the police stated that what they saw was west of them traveling to the north. There is a time discrepancy of five minutes in the reported times but this is not unusual since there could very well be errors in estimating the time or in a difference between two watches or clocks. It can be reasonably assumed that both parties observed the same thing.

The data received is very sketchy but indicates that the object may have been the vapor trail of a jet aircraft. More details on the sighting would be necessary before a definite conclusion can be reached, however.

III. Conclusion

Insufficient data for evaluation.

Los Alamos, New Mexico 12 November 1952

I. Description of Incident

A security guard at Los Alamos reported observing four, blinking, red, green, and white or yellowish lights. The lights appeared to be stationary or moving very slowly to the north. They were observed continuously for 16 minutes and first seen at 2223 MST.

The weather was CAVU. A fighter aircraft was put in readiness to scramble, but was not scrambled since no radar contact was made.

II. Discussion of Incident

The time, 05332, is two hours and 33 minutes past the scheduled 0300Z weather balloon launch at Albuquerque. This balloon drifted east and was very probably out of the area at the time of the sighting. It is possible that another weather balloon drifted into the area although in general lights on these balloons last only about one hour. In addition, weather balloons carry only one light. The low speed, absence of radar contacts, and the fact that the area is a prohibited flight area discount the possibility of an aircraft. It is also possible that a large research type balloon was in the area, although ATIC has no such flights recorded.

III. Conclusion

Possibly a balloon.

Ophiem, Montana - Glasgow, Montana 13 November 1952

I. Description of Incident

At 0243 MST on 13 November 1952 a weather observer taking a theodolite reading on a weather balloon at Glasgow, Montana, reported he observed five oval-shaped objects with "lights all around them" flying in a V-formation. Each object seemed to be changing position vertically by climbing or diving, as if to hold formation. The speed appeared to be very fast, the total time of observation being 20 seconds. The reported objects came from the NW, went straight over the center of the town, made a 90° turn, and departed toward the SW.

At 0220 MST an AC&W Station obtained an unidentified radar track beginning at 47°48'N-108°05'W and lost it at 0348 MST at 47°38'N-105°05'W. The altitude was estimated to be 15&,000' and the speed was 210 knots.

II. Discussion of Incident

If these data are plotted it shows that it is doubtful that the track observed on radar and the reported visually observed objects were the same. While the radar "blip" was going straight east, south of Glasgow (Glasgow being north of the radar track), the observer saw something come in from the NW, turn, and go to the SE over his position.

Since the objects were reported directly over the observer and no sound was heard, it is doubtful as to whether the objects were aircraft.

III. Conclusion

This was not a combination radar-visual sighting of the same object. There are no conclusions as to the nature of the reported visual sighting. The radar track, however, could be due to weather.

Davis, California 13 November 1952

I. Description of Incident

At 0605 PST on 13 November 1952 three businessmen from Davis, California, observed what they described as an indistinct, blunt, cylindrical object, with a bright flame behind it. The flame color was described by one source as blue-red and by another as silver-white. It was estimated that if the object had been a half mile away it would have been 20' in diameter. The object was observed for 15 - 30 seconds.

From their position at 38°29'N-121°37'W the object traveled through an arc of 45°. It was of low altitude when first seen.

The weather at 0630 PST was reported as scattered clouds at 5,000', visibility 25 miles. Sunrise was 0647 PST.

II. Discussion of Incident

All phases of this fit the description of a large fireball or meteor.

III. Conclusion

Probably astronomical.

Witchita, Kansas 15 November 1952

I. Description of Incident

At 2025 CST on 15 November 1952, an AF major with 5,000 hours flying time was engaged in watching pilots under his command shoot landings in a B-47. He, another rated officer, and several airmen observed what appeared to be an elliptical, blue-white light with an orange or red tail. The object moved erratically at a speed greater than that associated with a T-33 or B-47. The object was first observed to the north traveling rapidly on a heading of about 45°, then it suddenly appeared to stop. When the object stopped, the orange glow appeared to be on what had been the leading edge of the object. The object moved out again on a heading of 45° to a position NNW of the airport, then stopped again for two minutes. It finally disappeared to the north. It was in view a total of five to ten minutes.

The weather was CAVU. The winds were:

19,000' - 265°/35K

24,000' - 265°/40K

34,000' - 265°/40K

39,000' - 235°/64K

II. Discussion of Incident

Two lighted weather balloons were launched at 2030 CST. Although there is a discrepancy of 5 minutes in time between the sighting and the balloon launches, the description of the object, the described course, etc., fits that of a balloon.

It is believed that the reported object was one of the weather balloons.

III. Conclusion

Probably a balloon.

Washington, D. C. 15 November 1952

I. Description of Incident

At 0240 EST an AF captain and his wife observed some type of light they could not identify. Their attention was called to the object by its loud noise, described as similar to a flight of "six or more jets at low altitude". The light was white or pale blue and passed slightly to the east of the observer's zenith on a southerly heading. No wing tip lights were noted. After about seven or eight seconds the light made a left turn then started a steep climb. The light went out shortly after the climb was started.

II. Discussion of Incident

No follow-up was made on this incident, however, the description could well be that of an F-94 aircraft with its afterburner on and flying "blacked out".

III. Conclusion

Possibly aircraft.

Bower's Beach, Delaware 15 November 1952

I. Description of Incident

Two civilian sources reported observing a "deep orange glow with intermittent white lights". One observer was in Bower's Beach, Delaware, and one in Frederica, Delaware. Both observers saw the light generally south of their positions. It was first observed at about 1845 EST and was in view for ten minutes. It apparently had no lateral motion, since one observer lined up the object on a fixed reference point and he could not notice any motion.

Weather at the time was scattered clouds at 600' and an overcast at 5,000'. Visibility was seven miles.

II. Discussion of Incident

Since there was an overcast, any astronomical body can be ruled out.

Aeronautical charts show that in the general direction of the sighting and 10-12 miles away there is a reserved air space or caution area used by the Navy. Some activity in this area, such as a flare, could have been seen.

III. Conclusion

Possibly a flare.

Rhein-Main AFB, Germany 16 November 1952

I. Description of Incident

From 1045Z to 1900Z, the GCA radar at Rhein-Main picked up radar returns whose speed varied from 100 to 120 mph. The measured altitudes were from 200' to 800'. Both GCA operators have had two years' experience. Ground observers were sent to location of returns, but could not see anything in the air.

One operator had seen a similar situation while stationed in Alaska and it was thought to be caused by icing conditions.

The weather was reported as 7/8 mile visibility, light fog, ceiling 400' - 600', overcast, with a ground temperature of -3°C.

II. Discussion of Incident

The reported maneuvers and speeds of the radar returns are similar to those that have occurred at Washington National Airport.

No data on inversions are available, but similar sightings have been due to weather.

III. Conclusion

Returns due to weather.

Imperial Beach, California 16 November 1952

I. Description of Incident

At 1838 PST two duty officers at a Naval station sighted an unusual large orange disc of light which hovered over the water for three to four minutes and then proceeded upward at a high speed. The object later appeared again and appeared to be a large yellow ball which, when looked at through binoculars, seemed to have a bluish tinge around the edges.

II. Discussion of Incident

At approximately this time the Navy and U.S. Weather Bureau released radiosonde and piball weather balloons and since the objects hovered and then climbed, it is felt that either one of these caused the incident. The orange disc description fits here also as many times a rising balloon will catch the setting sun's rays and appear to be a glowing ball.

III. Conclusion

Probably a weather balloon.

Lumberton, North Carolina 16 November 1952

I. Description of Incident

At 1615 EST five civilians observed a bright orange, oblong, object moving slowly across the sky. No sound was heard.

II. Discussion of Incident

A jet aircraft was known to be in the area and flying in the same heading as the reported object. The sun shining on this aircraft undoubtedly accounted for the sighting.

III. Conclusion

Probably aircraft.

McAndrew AFB, Newfoundland 16 November 1952

I. Description of Incident

At approximately 0015Z on 16 November 1952 two observers, a tech sergeant and the base OD, observed a "large, brilliant object the size of a grapefruit". The object appeared to be traveling very fast as it came in from the SW, made a 90° turn directly overhead, and disappeared in a westerly direction. As it left the area it appeared to give off a brilliant "cold white light". The duration of the sighting was five to six seconds. No sound was heard.

Many other sightings of a similar nature were reported by Air Police Guards earlier in the evening.

Local radar was checked but they had carried no unknown tracks during the period.

An aircraft crew reported that they had seen a meteor at 2400Z while flying into the area.

The weather was scattered to no clouds at 2,000'; visibility 10 miles.

II. Discussion of Incident

There is a possibility that the reported object was the same meteor seen by the air crew at 2400Z, an error of 15 minutes is possible. Meteors, however, do not make 90° turns and since the turn reportedly occurred directly over the observers it is difficult to say the turn was an illusion. There are infrequent reports of fireballs "glancing" off the atmosphere. This phenomenon might appear to be a 90° turn.

The object evidently was very spectacular since the OD stopped his car, shut off the ignition and go out to watch. One observer stated that he was afraid the object was about to hit him.

Lacking data on the "odds" of a meteor or fireball appearing to make a 90° turns, the object cannot be identified as a meteor.

III. Conclusion

Unknown

Florence, South Carolina 17 November 1952

I. Description of Incident

At 1715 EST, several observers in and near Florence, S.C., observed a bright, elliptical-shaped object, thick in the center and tapering at the edges. It appeared to be traveling slowly. Observers included airport manager, Eastern Airlines captain (not airborne at time of sighting), a weather observer, radio operator, and a tower operator.

A jet aircraft was reported due over Florence radio at the time of the sighting.

II. Discussion of Incident

This is another sighting that appears better than average, as far as sources are concerned, but again certain data are lacking. Since a jet aircraft was due over the area, it could have been the jet. It is interesting to note that so many widely separated sources would all report an aircraft, especially since they can be considered fairly reliable observers.

III. Conclusion

Probably aircraft.

Salton Sea, California 20 November 1952

I. Description of Incident

The pilot of a B-50 aircraft reported observing a light that changed color from white to red to green. The B-50 was flying at an altitude of 16,000' on a heading of 275°. The time was 2005 MST. The light was observed at 11 o'clock from the aircraft. At first it appeared to be stationary then moved to the NW, disappearing as if it had been turned off.

II. Discussion of Incident

Although the description of the object is similar to a star or bright planet, the fact that it "went out" eliminates this possibility. The sighting was an hour and five minutes after a balloon launch and normally lights on balloons do not burn this long, it is not an impossibility, however.

This report is similar to past reports that have been received from this area.

III. Conclusion

Possibly a balloon.

Fort Benning, Georgia 21 November 1952

I. Description of Incident

At 2120 EST on 21 November 1952 an observer, not identified in the report, observed a blue-white object traveling WNW. The object was reported to be "the size of a golf ball". Object turned dull orange after several seconds and disappeared. One minute later it reappeared in the original color, turned north for approximately two minutes, then turned SSE and held this course until it was out of sight.

II. Discussion of Incident

The description of this object is similar to a meteor except for the length of time observed, over three minutes, and the disappearance, and reappearance. The reported change in course does not fit a meteor, but since it was a small change, WNW to N, it could have been an illusion.

Another possibility is a jet aircraft. The report makes no mention of the location of the object in relation to the observer nor to sound. If the object did not pass over the source and was only seen low on the horizon, it could have been an aircraft.

III. Conclusion

Possibly aircraft.

Aiken, South Carolina 21 November 1952

I. Description of Incident

On 21 November 1952 at 1822 EST, two heavy equipment operators working in the Savannah River AEC installation observed one round, glaring red, object with no tail, which appeared to be traveling at high speed. The object faded from view in the SSE after being in sight for about 30 seconds. It appeared to be losing altitude when it disappeared. No sound was heard.

II. Discussion of Incident

The description of the reported object fits the typical fireball or large meteor.

III. Conclusion

Probably a fireball.

Annandale, Virginia 24 November 1952

I. Description of Incident

For one hour between 1830 and 1930 EST on 24 November 1952, a civilian couple observed a bright glowing light "the size of a baseball" to the south of Annandale, Virginia. The light came north over the observers then made a 90° turn. When almost out of sight, it made a 180° turn and came back toward the observers. Binoculars were used to make the observation. There was no sound.

The weather was CAVU.

II. Discussion of Incident

This could very well have been a jet aircraft, possibly with an afterburner, except for the absence of sound. The light was apparently traveling fast and was large (i.e., larger than the "pinpoint" of light made by a high flying jet). If it was low enough to appear to be traveling extremely fast, it should have been heard since it passed nearly directly over the observers. It would be difficult to say it was definitely an aircraft.

III. Conclusion

Possibly aircraft.

East Glendale, California 24 November 1952

I. Description of Incident

At approximately 1548 PST three employees of a west-coast aircraft plant observed four unidentified flying objects in formation near Grand Central Air Terminal. The objects were described as being spherical in shape, and of unknown size. They were a dull grey aluminum color, and appeared to be either emanating light or reflecting shafts of sunlight. They first appeared in the NW and appeared to be on an easterly heading. At one time, a B-25 passed between the objects and the observers. The B-25 appeared to be at 1500' and the objects seemed to be about the relative size of a nacelle on the B-25.

The objects seemed to take on an elliptical shape, diminish in brilliance, then disappear at high speed. Only the sound of the B-25 was heard. The sighting lasted about 1 minute.

II. Discussion of Incident

These could have been a/c reflecting sunlight. The "sudden disappearance at high speed" could be due to a change in the angle of reflection causing it to rapidly diminish and fade from view.

No data about the angles are given so no angular velocity can be established.

III. Conclusion

Possibly aircraft.

White Sands, New Mexico 25 November 1952

I.- Description of Incident

The following is an extract from the Monthly Intelligence Summary, White Sands Proving Grounds. The source is a field grade officer assigned to White Sands:

"While returning to White Sands Proving Ground from Wm Beaumont Hospital, at approximately 2030 hours on 25 November 1952, I observed what appeared to be flares, or pyrotechnics, on the right side of the road. My first throught was that these objects were flares that were being fired by troops on a night project. However, shortly thereafter—a matter of seconds—I observed what appeared to be a flare land right in the middle of the road, about three or four hundred yards distant. It assumed the shape of a ball, having a green center, fading to a light hazy blue at the exterior. This light disappeared before my car arrived at the spot. After observing this light, I thought that the Department of Army had a new type pyrotechnics that I was not familiar with that they were using on a night problem. Approximately three to five minutes later I observed a light, or series of lights, approaching from the right side of the road, in the heavens, at an altitude of about three to five hundred feet and between 1/4 and 1/2 mile distant. I thought that probably, in conjunction with the night problem, this was an airborne drop of troops. I first thought it might be a C-119 or a C-123. However, this object made a right hand turn above the road and then disappeared at an angle of approximately 90° straight into the sky. I cannot state whether it was a plane or a type of aircraft. I can merely state that there were two rows of what appeared to be windows, brilliantly lighted, and I would estimate that they were five to six feet in height and six to eight windows in each of the two rows. After this object disappeared, I stopped my car and got out to see if I could see a plane but could see nothing. I turned off the motor on my car to see if I could hear the motors of a plane, but I could hear no sound. I then proceeded to White Sands Proving Ground."

II. Discussion of Incident

It is possible that the object was an aircraft except that from the description it appeared to be low if it were an aircraft, and evidentally no sound was heard. No follow-up investigation was made and since additional data are needed no evaluation can be made.

III. Conclusion

Insufficient data for evaluation.

Canal Zone 25-26 November 1952

I. Description of Incident

From 1800Z to 2349Z on 25 November 1952, two unidentified objects were tracked on gun-laying radar. The objects flew at an estimated speed of 275 knots and varied altitude between 1,000' and 28,000'. The area was put on a yellow alert after all known air traffic had been checked. Four aircraft were scrambled for visual search, but had no success.

At one time, 2330Z, an AF major observed a glowing yellow light traveling rapidly from east to west near France AFB. At the time of this visual sighting, the radar had the target in the France AFB area. Other reports of visual sightings were received, however, further investigation showed these to be the aircraft that had been scrambled for the attempted intercept.

Weather showed two inversion layers in the area, but the report states the possibility of weather causing the targets was checked before the yellow alert was called.

II. Discussion of Incident

Although the report on this incident is complete, there is still not enough data to make a complete analysis. The fact that inversions were noted raises the possibility of weather phenomena causing the targets.

III. Conclusion

Radar returns probably due to weather.

Goose Bay, Newfoundland 26 November 1952

I. Description of Incident

At 0230Z (2230 local time) an F-94 crew attempted to intercept a bright orange and red light, the light had no definite shape. The intercept was unsuccessful in that the object seemed to keep the same distance from the F-94. The F-94 was on a 180° heading from Goose AFB. No radar either airborne or ground was made.

The weather was CAVU.

II. Discussion of Incident

The report states that all aircraft in the area were accounted for. There is no reason to believe, however, that the F-94 was observing a bright star or planet. This has occurred several times in the past. The fact that the light appeared to stay the same distance from the aircraft is characteristic of a "star chase".

III. Conclusion

Possibly an astronomical body.

SE of Prescott, Arizona 27 November 1952

I. Description of Incident

While on a flight from El Paso, Texas, to Nellis AFB, Nevada, in a B-26 aircraft, an AF lt colonel and his crew chief observed four quick bursts of black smoke in tandem, directly ahead of their aircraft and at their altitude. The time was 1210 PST. After about 2 minutes, three more bursts appeared then three more. At 1218 PST, three more puffs were seen to the left of their course and ahead, with three more appearing at 9 o'clock. At this time, the pilot made a 90° turn to the left. The puffs of smoke continued as the B-26 made several turns in the area. Once the puffs of smoke would have bracketed the a/c had it continued on course. At one time, the pilot flew close to the puffs and they appeared to be yellowish in color and about 20' in diameter. Exceedingly rough air was noted close to the smoke puffs.

The entire incident lasted 20 minutes.

II. Discussion of Incident

The description of the smoke puffs would lead one to believe that the B-26 had encountered flak. The area of the encounter was far from any target area, however, and since the a/c was only at 10,000' under VFR conditions, it is doubtful that even if it were in a practice area it would be continually fired upon.

III. Conclusion

Unknown

DeQuincy, Louisiana 27 November 1952

I. Description of Incident

On 27 November 1952 at 2015 CST a woman reported seeing a "round and/or pyramidal shaped object with a bright reddish-pink color". At first it was stationary, then it began to move up and down. It was observed for 2 1/2 hours.

II. Discussion of Incident

Although no angles are given so an almanac can be checked, it is highly probable this lady was looking at a planet or star.

III. Conclusion

Probably astronomical body.

Ogden, Utah 28 November 1952

I. Description of Incident

Two pilots in a T-33 aircraft flying at 20,000' reported observing an object trailing a long amber-rose colored stream. The time of sighting was 1945 PST, 28 November 1952, and lasted for 20 minutes. The object appeared to be wavering slightly from side to side and remaining in a fixed position until the T-33 passed it, then it appeared to pick up speed.

II. Discussion of Incident

At 1745 PST the sun would be in a position to illuminate a vapor trail similar to the way the sun lights or colors clouds in a sunset.

III. Conclusion

Probably an aircraft.

Washington, D. C. 30 November 1952

I. Description of Incident

Source reported two stationary lights over Washington, D. C., at 2230 EST on 30 November 1952. Source "called from a bar and grill and sounded incoherent." The lights remained for several minutes then disappeared. An aircraft with both landing lights on appeared in the same location shortly afterward.

II. Discussion of Incident

Doubtful source calling from doubtful location.

III. Conclusion

Probably aircraft.

Washington, D. C. 30 November 1952

I. Description of Incident

At 0030 EST on 30 November 1952, the CAA radar at Washington National Airport again began to show "blips" similar to those in July 1952. They showed the same pattern and behavior as before with speeds of 90-100 mph with maneuvers identical to normal aircraft except for sporadic appearances and disappearances. The "blips" continued for an unspecified period of time. Aircraft in the area were alerted but could see nothing.

The weather included light snow. No mention was made of whether there was or was not an inversion.

"Blips" similar to the ones reported were seen on the previous night (29 November 1952). The weather at that time was CAVU with no inversion. At this time, the targets appeared over Andrews AFB but could not be seen from the ground.

II. Discussion of Incident

As stated above, this report is similar to the ones reported from the Washington National Airport Tower. In these there was a great deal of discussion as to the effects of inversions on radar.

III. Conclusion

None

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STATUS REPORT

PROJECT BLUE BOOK - REPORT NO. 10

FORMERLY PROJECT GRUDGE

PROJECT NO. 10073

27 FEBRUARY 1953

AIR TECHNICAL INTELLIGENCE CENTER

WRIGHT-PATTERSON AIR FORCE BASE

OHIO

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AUTH: CO, ATIC
BY: H.C. JOHNSTON
Lt Col, USAF
DATE 21 Apr 53

This report is the tenth of a series of monthly status reports of Project Blue Book covering the months of December 1952, January 1953, and February 1953.

Any additional information may be obtained on any incident by directing requests to Commanding General, Air Technical Intelligence Center, ATTN: ATIAE-5, Wright-Patterson Air Force Base, Ohio.

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STATUS OF PROJECT BLUE BOOK

I. OVERALL STATUS

There has been a noticeable decrease in the number of unidentified aerial object reports submitted to this Project in the period covered by this Status Report (December 1952, January and February 1953) when compared with the number submitted in the period covered by Status Report No. 9 (June, July, August, September, October and November 1952). Presently from two to three reports are received daily as compared to eight reports received daily during the period covered by the previous report.

Because of a marked decrease in newspaper publicity, fewer reports have been received from civilians with the result that military sightings now account for at least 60 percent of all unidentified object reports. In spite of the dropping of the subject by the national press, it is significant to note that a steady influx of three reports daily come in to Project Blue Book from persons who sincerely believe they saw an unusual phenomenon in the sky and this is one of the main reasons why the Air Force is still continuing and taking an interest in the Project.

Three incidents which occurred in January serve to illustrate the direct effect of publicity on the number and quality of FLYOBRPTS received by the Project. During the period 21 January to 27 January, a sighting from Northern Japan near Russian-held territory, a television program involving "flying saucers", and a sighting of an unidentified aerial object by a jet pilot on the West Coast all received considerable newspaper publicity which resulted in a noticeable increase in reports at the Air Technical Intelligence Center. This is illustrated by the graph in Section X of this Status Report.

Prior to the incidents mentioned above, the quality of flying object reports continued to improve in quality and completeness even to the extent that base intelligence personnel were analyzing reports at the locale of sighting, something which Project Blue Book encourages. There was a noticeable increase in the percentage of radar sightings made during this time. However, many reports submitted as a result of the flurry of late January sightings were so incomplete that many of them had to be categorized as "insufficient data". The probable reason for this is that the base intelligence officer responsible for preparing an unidentified aerial object report has lost interest in the subject due to the heavy load of low grade reports which he had to submit last summer.

During December, January, and February, Project Blue Book personnel spent a good portion of their time briefing such interested agencies as the Air Defense Command, the 4602nd Air Intelligence Service Squadron, and the Sandia Corporation with the dual purpose of (1) general education about Project Blue Book, and (2) bettering the quality of flying object reports themselves in addition to improving channels for obtaining supporting information necessary for analysis of a FLYOBRPT.

All reports received were screened and evaluated as soon as possible after being received. A percentage breakdown as to the evaluations is given below, along with a further breakdown of sources:

100 Total Reports for December 1952, January 1953, and February 1953

Unknowns	17.00%
Insufficient Data	26.00%
Aircraft	13.00%
Balloons	17.00%
Astronomical	20.00%
Other	7.00%
	100.00%

15% of the total involved radar detection.

Sources:

Military	62%
Civilian	38%

II. SIGHTINGS OVER NORTHERN JAPAN

In the last month there has been a definite increase in the number of reports received from FEAF by ATIC. They have been accompanied by some publicity in the national press. Included in the reports have been a certain number of observations from Northern Japan near Russian-held territory and for this reason they have been given a good deal of attention by Project Blue Book.

The two most publicized sightings occurred on 30 December 1952 and 9 February 1953; the first was seen by a Colonel in an F-84 over Hokkaido Island, the second by a pilot and a radar observer in an F-94 aircraft also over Northern Japan. Reports of both sightings have been received and checked by ATIC. The F-84 sighting was analyzed as a probable star since it seemed to remain on the same azimuth (270°) and elevation throughout the period of sighting. The F-94 report involves a radar contact by the radar observer with a simultaneous visual sighting of the object and cannot be explained at the present time.

Since July 1952, 16 reports of unidentified flying objects being sighted over Japan have been received from FEAF. Undoubtedly, there were numerous other observations reported to FEAF intelligence personnel which were evaluated and eliminated as known phenomena on the spot. Seventy-five percent of these sightings have been explained to the satisfaction of Project Blue Book. Of the total number of sightings from Japan, 18.75 percent involved some type of radar equipment.

III. CORRELATION OF RADATION COUNTS

In the summer of 1952 it was reported to Project Blue Book that in the past several years there have been some instances where there existed a supposed correlation between the visual sighting of unidentified object and a rapid rise in radiation count on radiation detecting devices in areas close to the Mt. Palomar Observatory, California, and later at Los Alamos, New Mexico. In early fall of 1952 Project Blue Book began to make inquiries about these occurrences. It was found that in October 1949 such an incident had occurred at the Mt. Palomar

Observatory and that the Navy had investigated. It was also learned that several times during 1950, 1951, and 1952 that same occurrence had taken place at the Los Alamos Scientific Laboratory in Los Alamos, New Mexico.

A trip was made to Los Alamos and the personnel who had made a study of the possible correlation were contacted. They very graciously made their files available to ATIC personnel and a thorough check of their radiation recorder records was made. Dates of all the sudden flurries of radiation were checked against Project Blue Book files of sightings; they were checked with the local newspapers in the Albuquerque area in an attempt to pick up any sightings that ATIC did not have on file; and they were checked against pick-ups of unknown targets on radar in the Albuquerque area. In no instance could any direct correlation be found. It is possible that something was observed and not reported or at least no record of the sighting was kept. However, there is no way to check back on this.

To further inquire into the matter, the Navy report of October 1949 was obtained. It stated that on two occasions at Mt. Palomar at the same time the radiation detection devices picked up some unknown flurry of radiation personnel from the observatory observed something in the air. In one instance the object appeared similar to a bird and in another instance very similar to a formation of aircraft. The Navy made a very detailed check into the equipment and went so far as to fly aircraft over the area to determine whether or not radar or other electronic equipment in the aircraft could have caused the sudden burst of radiation. These tests were made with negative results. It was finally determined that there was a very good possibility that the sighting and the detection of radiation was merely a coincidence, that the objects were possibly birds or aircraft, and that the sudden burst of radiation was due to a malfunction of equipment or interference that is not completely understood at the present time.

The results of the investigation were reviewed by several highly qualified scientists and it was their opinion that there was nothing highly significant in the supposed correlation.

IV. CONTRACTOR STATUS

Project Blue Book has a contract with a civilian research organization which serves the project with an IBM analysis of unidentified aerial object reports and technical analysis of any specific problem submitted. As was pointed out in the last status report (Status Report No. 9) coding and evaluation by the contractor of 1952 sighting reports is continuing and all reports for this year should be completely processed and ready for the IBM system by 15 March 1953. All sightings from 1947 to 1951 were submitted to a preliminary IBM analysis on 26 January 1953. This work is continuing and results of the analysis will be forwarded informally to Project Blue Book as soon as they are available.

A two-day evaluation conference between a Blue Book team and a contractor team was held on 22 and 23 January 1953 in which 145 1952 cases were given final evaluation in preparation for submission to the IBM analysis.

A rock sample was sent to Project Blue Book by a retired Lt Commander in the Navy in connection with a sighting he had made on 12 September 1952. The ex-officer, who was also a Naval flier, was convinced that the rock, which has an unusual shape, was directly associated with the flying object he observed. Blue Book asked for a contractor analysis and after close study the contractor

confirmed the opinion of Blue Book that the rock merely represented a piece of common slag from an open hearth furnace.

V. BRIEFINGS GIVEN

A. Sandia Corporation, Albuquerque, New Mexico

On 6 January 1953 at 1330 hours MST, Project Blue Book personnel presented a briefing to 200 scientists and engineers of the Sandia Corporation. The briefing consisted of a short history of the project, details of present operations and recent sightings. Including the question and answer period, the briefing lasted 2 1/2 hours. The briefing was requested by the Sandia Corporation as a matter of general interest to its scientific personnel.

B. 34th Air Defense Command Division, Albuquerque, New Mexico

On 6 January 1953, the Project Blue Book briefing team met with Headquarters personnel and intelligence personnel of the 34th Air Defense Command Division, Kirtland AFB, for the purpose of briefing these personnel on Project Blue Book and also to meet scientific personnel of the Los Alamos Scientific Laboratory. In addition to outlining a general picture of the function of Blue Book, the specific items of (1) an instrumented area for recording unidentified flying objects was discussed with the 34th, and (2) radiation correlation with unknown sightings was discussed with the Los Alamos scientists.

C. A.D.C. Officer's Call, Ent AFB, Colorado Springs, Colorado

An Air Defense Command Officer's Call was briefed on 24 January 1953. The briefing consisted of a presentation of Project Blue Book's background and was slanted toward gaining the assistance of Air Defense Command organizations in the analysis of a FLYOBRPT.

D. Officer's Intelligence Class, Lowry AFB, Denver, Colorado

On 13 February 1953 a briefing was given to a representative officer's class of the Air Intelligence School at Lowry. Many officers graduating from this basic school will undoubtedly submit a FLYOBRPT to ATIC and such a briefing was considered highly desirable in an attempt to raise the standard of reporting.

E. Air Intelligence School Instructor's Briefing, Lowry AFB, Denver, Colorado

Since it is not feasible to brief the many classes of Air Intelligence Officers at Lowry on the requirements of Blue Book, the best compromise plan was to brief the instructor personnel of the school so that they may pass the information along to their classes. This briefing was given on 16 February 1953.

F. The 4602nd Air Intelligence Service Squadron, Peterson AFB, Colorado Springs, Colorado. On 13 February 1953, AISS was briefed and the feasibility of Project Blue Book's utilizing their field units was discussed. This organization has the responsibility, in the case of combat, of supporting the intelligence mission of the Air Defense Command by overt collection, limited field

analysis and rapid reporting of air combat intelligence within the area of ADC's responsibility. Due to the combat-ready nature of the 4602nd's mission, it is concerned mainly at the present time with training its personnel. For this reason ATIC hopes that the organization will be able to assist Project Blue Book in the rapid reporting and evaluation of unidentified aerial object reports.

Headquarters of the 4602nd is at Peterson Field, Colorado Springs, Colorado, and has three detachments at San Francisco, Kansas City, and Newburg, New York, which in turn have control of 14 flights spread through the Z.I. The flights are the field agencies which would do the actual collection of enemy equipment and personnel in the event that enemy aircraft fell in the United States. Project Blue Book has initiated preliminary plans with AISS to utilize personnel in these flights to investigate and analyze reports of unidentified aerial objects and it is hoped that final coordination on the plan and its implementation will come about in the near future. This would give Project Blue Book rapid first-hand information from trained intelligence officers.

VII. VIDEON CAMERA STATUS

Since the period of the last status report, tests have been made on the camera and it has been found that the diffraction grid has disintegrated on a majority of them. The grids are slowly losing their light separating ability due to what is apparently some type of chemical decomposition. The Project's scientific contractor is attempting to analyze the difficulty and will advise ATIC of its findings.

Coordination has been received from the Air Defense Command and the Airways and Air Communications Services (AACS) to place the grid cameras in control towers and selected radar sites. This cannot be realized, of course, until the cameras are made operational.

VIII. CONTRACT ASTRONOMER

Blue Book has a working agreement with its contract astronomer whereby he reviews all sightings for possible meteor or astronomical explanations on a weekly basis.

IX. REVIEW OF 1952 SIGHTINGS

For the years 1947 to 1952 Project Blue Book has received through military channels and analyzed over 2,500 reports. In addition, the project has received hundreds of letters from civilians. In general, the data contained in these letters are too nebulous to evaluate. Since 1 January 1952, Blue Book has analyzed over 1,000 reports received through military channels and these have been broken down into the following categories by percentages of the total reports:

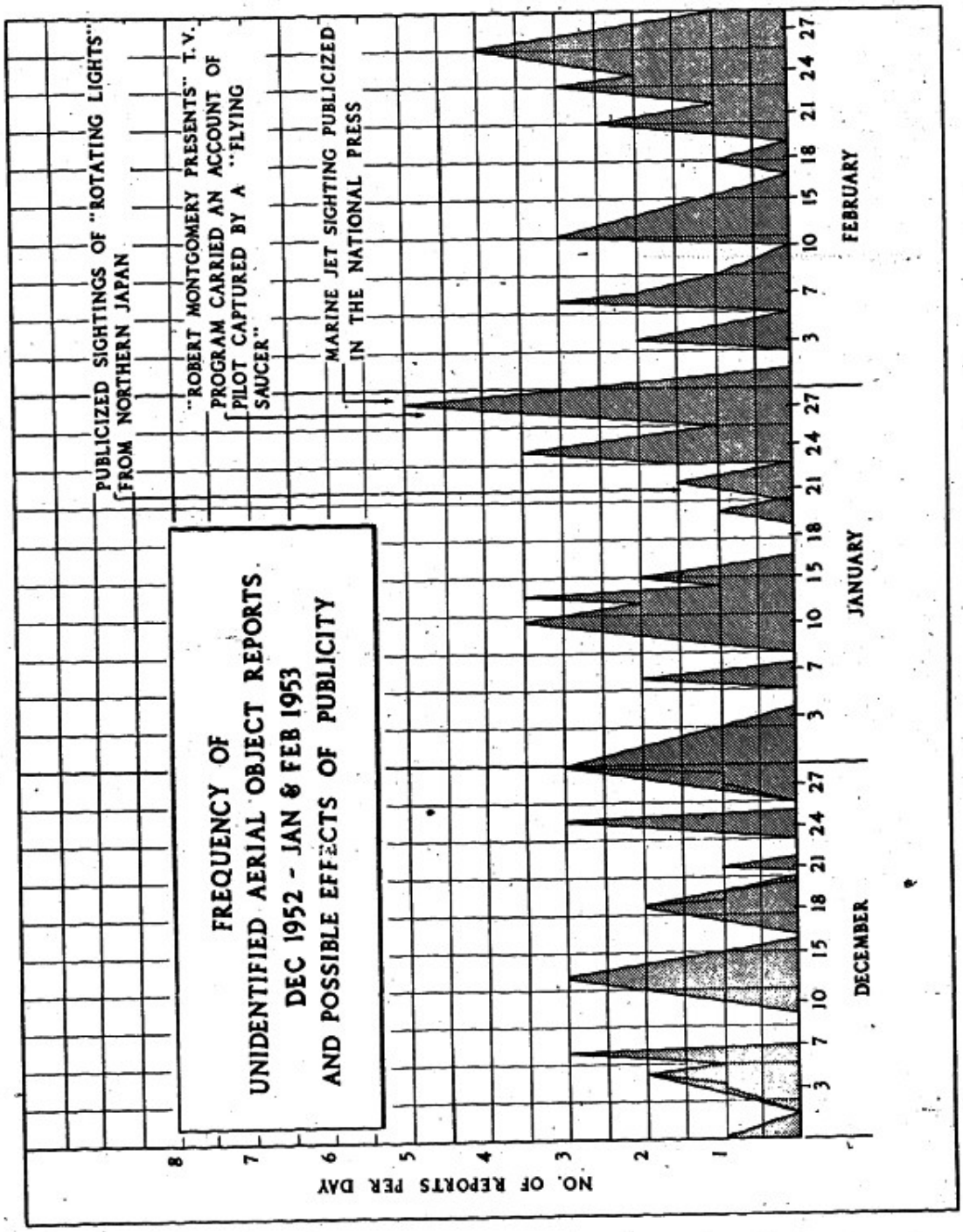
Balloons		18.51%
Known	- 1.57	
Probable	- 4.99	
Possible	- 11.95	

Aircraft		11.76%
Known	- 0.98	
Probable	- 3.04	
Possible	- 7.74	
Astronomical		14.20%
Known	- 2.55	
Probable	- 4.01	
Possible	- 2.64	
Other		4.20%
Hoaxes		1.67%
Radar (where explanation is not obvious)		6.84%
Insufficient Data to Evaluate		22.72%
Unknown		20.10%

As to the breakdown of types of sources making the report, the following figures represent percentages received from arbitrarily categorized groups:

Civilians (General - no special qualifications that would establish them as better than average observers)	47.08%
USAF Pilots and Aircrew Members (while flying)	11.02%
Airline Pilots (while flying)	2.00%
Civilian Pilots (non-airline while flying)	4.14%
Tower Operators (civilian and military)	0.86%
Balloon Observers	1.00%
Civilian Scientists, Engineers, etc.	3.29%
Military Personnel (general)	18.03%
Radar Returns	12.58%

Thus far the relatively limited statistical approach to unidentified objects has proceeded along only the most general trends. For example, the month of July 1952 was high with 440 sightings. Another general trend exists in the geographical location of sightings since they concentrate around Washington, D. C.; San Antonio, Texas; Albuquerque, New Mexico; and San Francisco, California. Another interesting development shown by the statistical survey is that a comparatively high percentage of sightings occur during the twilight hours. The simplest explanation is that many people are out-of-doors at that time and the rays of the setting sun penetrating the upper atmosphere will reflect brightly from any reflective surface. The IBM analysis by the contractor should afford any significant trends involving shapes, sizes, estimations of velocity and altitude, course headings or characteristic maneuvers of unidentified flying objects.


FREQUENCY OF
UNIDENTIFIED AERIAL OBJECT REPORTS
DEC 1952 - JAN & FEB 1953
AND POSSIBLE EFFECTS OF PUBLICITY
PUBLICIZED SIGHTINGS OF "ROTATING LIGHTS" FROM NORTHERN JAPAN
"ROBERT MONTGOMERY PRESENTS" T.V. PROGRAM CARRIED AN ACCOUNT OF PILOT CAPTURED BY A "FLYING SAUCER"
MARINE JET SIGHTING PUBLICIZED IN THE NATIONAL PRESS
NO. OF REPORTS PER DAY
1
2
3
4
5
6
7
8
DECEMBER
JANUARY
FEBRUARY
3 7 10 15 18 21 24 27

T53-3695

X. FREQUENCY OF FLYOBRPTS

Frequency of FLYOBRPTS for the period of December 1952 to February 1953 and correlation with nationally publicized incidents follow.

XI. SYNOPSIS OF FLYOBRPTS

An individual account of the majority of unidentified aerial object reports submitted to Project Blue Book during the months of December 1952, January and February 1953, follows.

Mitchel Air Force Base, New York 1 December 1952

I. Description of Incident

Between 0430 and 0500 EST a number of observers from varying locations around the New York City area noticed a single, round object with colors ranging between white, white-orange and amber. All observations placed the unknown in the NW approximately 15° above the horizon on a 300° azimuth heading with a slow drift to the south finally sinking out of sight. All observations were unaided visual sightings or with binoculars. Although radar was tried, there was no electronic return from the object.

Observers were experienced CAA rated Airways Operations Specialists and Control Tower Operators. Observations of the reported object were as follows:

Location	Azimuth	Elevation	Times
a. Teeterboro Tower	275°	0°	0447
b. Westchester Tower	280°	15°	0445
	280°	0°	0456
c. Newark Tower	315°	2°	0458
	270°	0°	0509
d. La Guardia Tower	290°	4°	0430
	310°	2°	0455
e. Idlewild Tower	270°	15°	0445
	225°	0°	0500
f. Mitchel AFB Tower	285°	6°	0441
	305°	0°	0459

An Eastern Airlines Flight inbound to La Guardia was queried as to a strange light appearing in the west. The pilot sighted the object after several minutes of scanning and reported "a cluster of lights" close to the western horizon.

The weather at the time of observation was CAVU and extremely clear for the New York City vicinity with the winds NNW at 16 knots average.

II. Discussion of Incident

Intelligence personnel at Mitchel AFB determined that the planet Jupiter, on 1 December, has an approximate azimuth of 300°, a -2 magnitude (extremely bright), and disappears below the horizon at approximately the same time the object was last observed. Undoubtedly, the unknown object is thus explained. The white to amber color range can be explained by the presence of light refracting through atmospheric dust. This report is one of the most complete in ATIC files and the resourcefulness and common sense of the Mitchel Intelligence officers is to be commended. Complete personal statements and azimuth and elevation headings were obtained from 6 points of independent observation. If the object had not turned out to be Jupiter, triangulation from these data would have been possible.

The sighting is very similar to one at Presque Isle AFB, Maine, on 10 Oct 52, which also was determined to be Jupiter.

III. Conclusion

The planet Jupiter.

Colorado Springs, Colorado 4 December 1952

I. Description of Incident

An Air Force sergeant and a civilian sighted a round aluminum colored object flying east to west. It appeared to be changing shape as it proceeded out of sight to the west. The approximate time of sighting was 1100-1200 MST, for 1 minute of duration. The two men state that the object was going slightly faster than a conventional jet aircraft, but did have a perceptible aluminum hue. No sound was heard as a large machine was operating at close range. While the object was overhead, several right angle turns were made without apparent slowing of speed.

II. Discussion of Incident

Aircraft in the area included B-29's and B-50's as well as a Camp Carson observation plane. The B-29's and B-50's are ruled out as a possibility since they were on a south heading 7 minutes after the sighting took place.

The observation plane, however, was in the area at the exact time of observation and on a westerly heading. The changing shape, which happened only once, could have been the bright mid-day sun reflecting from this aircraft. The weather conditions were CAVU.

III. Conclusions

Possibly aircraft.

Congaree Air Force Base, South Carolina 4 December 1952

I. Description of Incident:

One unidentified object was sighted by radar at Congaree AFB at 0342 EST by an AN/MDS-5 radar set. The sighting was strictly electronic, not visual. The object was sighted 100 miles NE of the radar site, traveling at an estimated speed of 6,000 mph with contact lasting 5 minutes. The weather at the time consisted of low stratus clouds, no precipitation, and winds NE at 5 mph.

All observers were airmen graduates of radar operator's school with between two to five years experience and considered excellent and reliable sources.

II. Discussion of Incident:

Several past radar sightings of this type have been received by ATIC and evaluated as probable interference from another radar station. This incident may fall into this category eventually in that the excessive speeds of 6,000 mph plus the object's tengency to the radar beam's sweep indicate that interference may have been present. However, not enough information has yet been gathered on local weather, temperature and moisture v.s. altitude, so this incident will be carried as unknown until such information arrives.

III. Conclusion:

Unknown

Lackland Air Force Base, Texas 5 December 1952

I. Description of Incident

While orbiting over Lackland AFB a T-28 type aircraft sighted an unusual blue light of about half the intensity of the normal glow emitted by a T-33 position light. The time of sighting was approximately 2048 CST under clear weather conditions with the wind at 6,000 feet from 15 degrees at 25 knots. The object's maneuvers consisted of a counter-clockwise orbit over the air base, an apparent pass on the T-28 and finally an irregular rapid ascent and disappearance to the south. The pilot of the observing aircraft attempted an interception but overshot. The object was not sighted after 2056 CST.

II. Discussion of Incident

Student flying in jet type aircraft was in progress at the time of sighting. The observing pilot saw these aircraft and could not have confused them with the unidentified object. A scheduled balloon launch from Lackland AFB was set for approximately 2100 CST, very close to the time of sighting. In addition, the orbiting climb of the object as well as its general southerly heading (which ties in with the winds aloft) indicate that the unknown was probably a balloon. Project Blue Book has had many reports in the past of known balloons apparently intercepting investigating aircraft.

III. Conclusion

Probably a balloon.

Bitburg, Germany — 6 December 1953

I. Description of Incident

The co-pilot of a London-to-Frankfurt commercial flight sighted a fast moving object for a 4 to 5 second period. The unknown phenomenon crossed his flight path in front of him at a 90° angle and abruptly disappeared in a downward direction. Time of sighting was 1800. The object was bright at its core with a faint tail.

II. Discussion of Incident

This is a rather incomplete report. A check was made with the Frankfurt flight service center which revealed that no aircraft were in the vicinity. These factors enter into the evaluation of this report: 1) The object arched downward and had a tail. 2) It was seen for 4 to 5 seconds. These points are characteristic of a meteor.

III. Conclusion

Probably a meteor.

Angoon, Alaska 6 December 1952

I. Description of Incident

An Air National Guard pilot sighted an object consisting of two shiny globes connected by a solid rod proceeding in a southerly direction. Time of sighting was 1915Z and lasted 3 minutes. The object assumed a flattened shape at times, but the observing pilot was unable to distinguish any lights, vapor trails or exhaust smoke although he chased the object until it apparently accelerated and disappeared in the sun. The pilot estimated size comparable to a Grumman Goose aircraft. Weather at the time of sighting was clear.

II. Discussion of Incident

This report is very sketchy and vague and there is not sufficient information to come up with a conclusion. The description of the object is quite similar to reports of known upper air research balloons and the fact that it appeared to gain altitude would lend credence to this explanation. However, among other items, no wind direction is known thereby eliminating a tie-up between the object's path and upper air wind currents.

III. Conclusion

Insufficient data to evaluate.

Madison, Wisconsin 9 December 1952

I. Description of Incident

Four bright lights in diamond formation were sighted at 1745 by a captain and a lieutenant flying in a T-33 aircraft located south of Madison, Wisconsin. The pilots followed until they overtook the objects and continued following them until low on fuel at which point they returned to their base. At no time was a silhouette visible, even against the lights of Milwaukee. Visibility was almost unlimited with a broken cloud deck at 25,000 feet. The observing aircraft was at an altitude of 8,000 feet.

II. Discussion of Incident

Local radar was contacted to determine if they picked up the unidentified objects with negative results. The objects were traveling at a very high speed, excessive for weather balloons. The only possible explanation would center around aircraft in the area. To fit the speed of the object the aircraft would probably have to be in the jet category. There is no record of local or transient aircraft in the area. Furthermore, local radar was carrying the T-33 on its scope but had no return from the unidentified object. If the unknown was an aircraft it would have been evident on the scope.

III. Conclusion

Unknown

Odessa, Washington — 10 December 1952

I. Description of Incident

Two pilots in an F-94 made visual and radar contact with a large, round white object larger than any known type of aircraft. A dim reddish-white light came from the object as it hovered, reversed direction almost instantaneously and then disappeared. The object appeared to be level with the intercepting F-94 at 26,000 to 27,000 feet. Airborne radar and visual contact were simultaneous and lasted for 15 minutes. F-94 attempted to contact local GCA but without success. Weather was clear above 3,000 feet. Time of sighting was 1915 PST.

II. Discussion of Incident

Two additional F-94 were in the general area but at lower altitudes and thus are eliminated as possible cause for the sighting. The description of "large, round and white and extremely large" is significant: Upper air research balloons are tear-shaped and made of translucent polyethylene and at cruising altitude expand to as much as 90 feet in length. The equipment hanging below the balloon is capable of making a return to airborne radar. Although ATIC has received no record of upper air research balloon tracks for this date the description of the object allows a preliminary evaluation of "possible balloon".

III. Conclusion

Possible balloon.

Pope Air Force Base, South Carolina 10 December 1952

I. Description of Incident

From 1420 to 2215 Z a ground radar station picked up an unidentified object on its scope. It appeared as a stationary object with a slight circular motion which did not cancel out when the moving target indicator was employed. The sighting showed that its altitude was 8,000 feet at 8 1/2 miles from the station. Weather conditions were fair with alto cumulous clouds, no temperature inversions present in the area. Eight transient aircraft flew through the area during the radar observation and an F-51 was directed to investigate. The pilot saw nothing unusual. The radar operators involved have had several years experience.

II. Discussion of Incident

Photographs were taken of the PPI scope but have not been received by ATIC. There is a possibility that local cloud formations may have caused a spurious radar return. Other than this there appears to be no plausible explanation for the incident.

III. Conclusion

Possibly weather phenomena.

Los Alamos, New Mexico 12 December 1952

I. Description of Incident

At approximately 1915 MST an Atomic Energy Commission security employee sighted an unusual phenomenon consisting of an object which appeared to him as a white tennis ball leaving a trail of sparks. The object was in sight approximately 3 seconds, disappearing suddenly.

II. Discussion of Incident

The description above closely resembles many others submitted to ATIC which have been evaluated as astronomical phenomena. The short time in sight and the "sparks" are significant.

III. Conclusion

Probably meteor.

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UNCLASSIFIED

McGuire Air Force Base, New Jersey 12 December 1952

I. Description of Incident

Two observations were made of an unidentified light at 0025 and 0030 EST by two airmen of this base. At first, the object appeared directly overhead, where it remained for 1 minute then reappeared 5 minutes later for 40 to 50 seconds. Observation was visual without the aid of binoculars or electronic equipment. The position of the object at the time of the second sighting seemed lower, heading to the east. The light appeared noticeably larger.

II. Discussion of Incident

The night was cold and clear with high winds. It is probable that an aircraft in the McGuire traffic pattern could have caused the sighting.

III. Conclusion

Probable aircraft.

London, England 12 December 1952

I. Description of Incident

An observer in London observed a watermelon-shaped object of white light estimated to be as high as 1,000 feet then disappearing behind some buildings. Object was slow moving and was sighted at 0300 for 3 minutes.

II. Discussion of Incident

This report is very brief. Nothing is known about the reliability of the observer, local air traffic, beacons on water towers, etc. Therefore, no real evaluation can be attempted although the description sounds like the landing light on an incoming plane.

III. Conclusion

Insufficient information.

Southern Japan 14 December 1952

I. Description of Incident

From 0355Z to 0410Z an object was observed from an AFB in Southern Japan. Object appeared very similar to an evening star, was first yellow in color, but then intermittently turned orange. It was located low on the horizon at a 200° azimuth from the point of observation and appeared to be sinking slowly to the south. However, when it finally disappeared below the horizon, it again assumed the 200° bearing.

Weather in the locality was excellent. Radar attempted to pick the object up, but with no success.

II. Discussion of Incident

Several factors in this sighting are significant. Primarily, the object was described by the observers themselves as "starlike". Secondly, the initial observation as well as the final observation placed the unknown at a 200° azimuth. This indicates that the object probably was a star setting in a straight downward line in the SW. The changing color is a well-known phenomena caused by seeing at great distances.

III. Conclusion

Probably astronomical.

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UNCLASSIFIED

Hurstville, South Carolina 15 December 1952

I. Description of Incident

At 0915 EST an RF-80 over this location visually sighted a circular silver object about the size of a half-dollar. Object was seen for a period of 10 to 15 seconds and apparently was oscillating, losing and gaining altitude alternately. The pilot was on a 270° heading at 15,000 ft. and saw the unknown at a relative bearing of 330° at approximately 30,000 ft. The weather was clear with CAVU conditions.

II. Discussion of Incident

Since this sighting occurred 10 minutes before a similar one at Greensboro, North Carolina, the possibility of the two pilots actually seeing the same object has been looked into. The following conclusions have been drawn: The objects could not have been a single weather balloon launched at Hurstville, South Carolina, because the prevailing winds for the general area were from 360° at 75 knots, or blowing directly against a free floating object and carrying it south of the original observation point, nor north. Secondly, the objects could not have been a single jet aircraft traveling from Hurstville north to Greensboro. The distance is 115 miles between sightings and the sightings were 10 minutes apart thereby necessitating a ground speed of 690 mph. With a general wind from the north blowing at 75 knots at 25,000 ft. it seems unlikely that a jet could hit this speed. Furthermore the description of the unknown as "round and silver" from experienced fighter pilots indicates that the objects probably were not jets. Although there was much local air traffic in both sightings, aircraft has been eliminated as a possibility for the above reason.

Both sightings occurred within an hour of a scheduled rawinsonde weather balloon release at Greensboro, North Carolina, and an unscheduled release around the Hurstville area. Taking the descriptions given of both objects, which are, incidentally, very characteristic of balloon observations received by ATIC, the conclusion reached is that the object seen at Hurstville was possibly a balloon. At Greensboro probably a balloon.

III. Conclusion

Possibly a balloon.

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UNCLASSIFIED

Greensboro, North Carolina 15 December 1952

I. Description of Incident

An RF-80 in flight over Greensboro sighted a spherical object with a bright silver color at about 0925 EST on 15 December 1952. It moved from a 12 o'clock high position to 6 o'clock high when the pilot lost contact with the unknown. Pilot was on a north heading at 25,000 feet traveling at 300 mph.

II. Discussion of Incident

Two aircraft from Shaw AFB were in the area at the time of sighting as was a balloon released from the weather station at Greensboro. The pilot probably could have recognized the aircraft but a silver, round, weather balloon might not be so easily recognized due to its small size. It appears that the latter explains the cause for this sighting.

III. Conclusion

Probably a balloon.

Goose AFB, Labrador 15 December 1952

I. Description of Incident

Visual contact was made by two aircraft, a T-33 and an F-94, of an unidentified aerial object after being vectored to the target by GCA. The object had no definite shape, was bright red and white and was seen from 2315Z to 2340Z. Airborne visual contact was established as soon as the F-94 entered the intercept area. No engine or jet exhaust was visible. The F-94 chased the object an an indicated airspeed of 375 knots but could not overtake it.

Weather was clear with visibility of 30 miles, winds at 14,000 ft. (altitude of the observing aircraft) was from 270° at 25 knots. The F-94 was on a heading of 270° while on its intercept run.

II. Discussion of Incident

Two C-54's from Goose AFB were in the area at the approximate time of sighting. One of these aircraft was observed by the F-94, the other was not. However, the unidentified object could not be the unobserved C-54 due to the speed factor. The F-94, at 375 knots, could have overtaken a C-54. There may have been a balloon launch at 2100Z from Goose Air Weather Service but here again there is a conflict because the object was sighted at 2315Z, two hours after launch. An astronomical explanation does not ring true since it is improbable that stars and meteors can be recorded by ground radar or airborne radar. Therefore, a plausible explanation for this sighting seems to be impossible.

III. Conclusion

Unknown.

Newcastle, Indiana 17 December 1952

I. Description of Incident

From 2120 to 2122 CST a visual sighting was made from the ground by members of the Ground Observer's Corps on duty at Newcastle. They sighted a round and flat object of orange color disappearing normally into the distance from east to west.

II. Discussion of Incident

This report is too incomplete for even preliminary interpretation.

III. Conclusion

Insufficient information.

Narsarssuah AFB, Greenland 18 December 1952

I. Description of Incident

An unidentified aerial object was sighted to the northwest of this air base by an Air Force Staff Sergeant and a civilian. The unknown object appeared to climb vertically and then level off. It gave off a black smoke at the beginning of its ascent.

II. Discussion of Incident

There was an L-20, a C-54, an A-16, and an SB-17 in the area. The air base making the report later notified ATIC that the object had been definitely established as the SB-17.

III. Conclusion

Was aircraft.

Anderson AFB, Guam 19 December 1952

I. Description of Incident

From 2050 to 2055 hours an unidentified aerial object was sighted from three separate points of observation -- (1) ground crew personnel at Anderson AFB, Guam, (2) a Naval Officer 14 miles south of Anderson AFB, and (3) from an incoming B-17 115 miles from Guam on a westerly heading. The object or objects in all cases were reported to be on a heading of 270°, appeared cylindrical in shape, of silvery color with a bright flame trailing from the rear. The speed was considered to be in considerable excess of that of a conventional jet and in each case the sighting did not exceed 45 seconds.

II. Discussion of Incident

The object was seen at 0850 a.m. at which time it would be too bright to see a meteor or star. It appears that all observers saw the same object since descriptions, directions given to the unknown, and time of sighting all coincide. The B-17 pilots sighted the object 115 miles west of Guam, five minutes after the other sightings and yet the object was reported to have been going west of Anderson AFB five minutes earlier. This seeming discrepancy here might be explained by the fact that the time estimate by the B-17 pilots was off. The object appears to be going too slow to be a meteor and all local aircraft have been accounted for. There was a scheduled balloon launch at Guam at 2100Z close to the sighting time but the description of the object does not coincide with usual balloon descriptions.

III. Conclusion

Unknown

T53-3695

San Antonio, Texas 21 December 1952

I. Description of Incident

One round, unidentified object of undetermined size, that emitted an intense green light was observed and reported by a civilian man while driving in his car in San Antonio. Time of sighting was 1815 hrs., CST, for a few seconds only. Object looked like a "Roman Candle" and faded just before disappearing.

II. Discussion of Incident

This can be written off with quite a bit of assurance as simply a common meteor. It has all the characteristics, including a short time in sight and fad out just before disappearing.

III. Conclusion

Probably meteor.

~~SECRET~~

UNCLASSIFIED

Camp Carson, Colorado 24 December 1952

I. Description of Incident

Observers at Camp Carson sighted a silvery unidentified flying object at 0617 MST. It appeared circular in shape about the size of a baseball, changing later to a "tear-shaped" configuration and hovered in view for two to three minutes after which it disappeared at a high rate of speed. Observers were three airmen assigned to this base and all stated that the unknown object was located south of their observation point. The object emitted an intermittent white light while in view.

II. Discussion of Incident

Although the sighting took place two hours after a scheduled piball balloon release at Pueblo, Colorado, this report has been evaluated as possibly balloon due to the description. Its tear-drop shape indicates that it may be a large pear-shaped upper air research balloon with a pilot light. ATIC has not yet had the opportunity to check the object against known upper air research balloon tracks but tentatively evaluates the sighting as shown below.

III. Conclusion

Possibly balloon.

T53-3695

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UNCLASSIFIED

Canadian, Texas 27 December 1952

I. Description of Incident

Several civilian eye-witnesses observed an unidentified aerial object between 2200 and 2300 hours CST, for two to three minutes. It was described as round, bluish-white light of high intensity and disappeared by going out of sight to the southwest. The object passed low overhead then appeared to climb upward at the end of the sighting.

II. Discussion of Incident

Local air traffic has not been identified in this sighting. Pending this, the object appears to be a jet aircraft's exhaust seen at a low altitude, perhaps with its afterburner cut in. The night of sighting was extremely clear facilitating observation of any object crossing the sky. No jet noise was heard, however, the observers were in a moving car. The jet may have been based at Amarillo, a nearby air base.

III. Conclusion

Possibly aircraft.

Albuquerque, New Mexico 28 December 1952

I. Description of Incident

At 2309 CST a military pilot sighted an elongated cigar-like object about the size of a medium bomber with an exhaust about eight times the length of the object itself. It traveled from east to west over Albuquerque, New Mexico. All sightings were visual for a period of 10 to 20 seconds. There were broken high clouds at 30,000 feet with 40 miles visibility.

II. Discussion of Incident

All air traffic in the area was identified by Kirtland AFB. The object may have been a meteor since the time of sighting was brief. In addition the object had a tail, common to some meteors. However, not enough concrete information is available to afford a possible solution. ATIC is in the process of checking past sightings against known meteor tracks and an answer might be found here.

III. Conclusion

Insufficient information.

T53-3695

Los Alamos, New Mexico 30 December 1952

I. Description of Incident

An object traveling in a slight curve and accompanied by a high pitched crackling noise which trailed the object by four seconds was observed by an employee of AEC Security Section. The time of sighting was 2002 MST in clear weather conditions of 40 miles visibility. The observers credibility is considered excellent.

II. Discussion of Incident

This report can be categorized as a low meteor, some of which emit the sound described above. Length of observation was extremely brief at two seconds.

III. Conclusion

Probably meteor.

Oldtown, Maine 1 January 1953

I. Description of Incident

An airman sighted an unidentified flying object at 0815 Z. The object was round and small and appeared to be whirling at its top. It moved NNE, changing color in sequences of red, blue and white. From time to time, it maneuvered erratically.

II. Discussion of Incident

The report is lacking in background data. From the description, the object could possibly be a balloon.

III. Conclusion

Insufficient data to evaluate.

Craig, Montana 3 January 1953

I. Description of Incident

At 0400 Z three sources observed an aerial object 25 to 40 feet long and 18 to 25 feet thick with the appearance of two soup bowls put together. There were several lighted windows with what appeared to be a porthole on the side. The object moved slowly at first, then began a rapid climb. The manner of disappearance was unspecified. The object first appeared at 200 to 300 yards distance from the observers at an altitude of 10 to 15 feet.

II. Discussion of Incident

An investigation of the sources revealed that they are mature, reliable and, at least in one case, relatively experienced persons.

III. Conclusion

Unknown

~~SECRET~~
UNCLASSIFIED

Eau Gallie, Florida 4 January 1953

I. Description of Incident

At 2345 Z a civilian employee of Patrick AFB observed an unidentified aerial object for three seconds. Source compared the object to a flying wing and said that it was at an altitude of less than five hundred feet, flying at about 500 mph in a SSW direction. Source saw at least 4 blue lights on the lower surface of the object. The weather was cold and clear with little or no wind. No other person observed the object.

II. Discussion of Incident

The source appears to be an unusually reliable and experienced observer.

III. Conclusion

Unknown

Adak, Alaska 4 January 1953

I. Description of Incident

At 0910 Z a bluish spherical light with a tapering tail was observed moving soundlessly at a tremendous speed and at a great distance, parallel to the horizon, for 3 seconds.

II. Discussion of Incident

The report indicates that the object was probably a meteor. The description given closely approximates a meteor's performance.

III. Conclusion

Probably astronomical phenomenon.

Warner-Robbins AFB, Georgia 7 January 1953

I. Description of Incident

At 0200 Z two civilian sources observed an orange glowing object traveling west at a slow rate of speed north of Warner-Robbins AFB. The object was visible for 6 to 7 minutes.

II. Discussion of Incident

There were no weather balloons released in the area, nor was there any reported aircraft traffic, but it is felt that an aircraft did cause the sighting because of the description.

III. Conclusion

Possibly aircraft.

Larsen Air Force Base, Washington 8 January 1953

I. Description of Incident

At 1515 Z over sixty varied military and civilian sources observed one green, disc-shaped object. The observations continued for fifteen minutes during which time the object moved in a southwesterly direction while bobbing vertically and going sideways. There was no sound. An F-94 aircraft was scrambled but a thirty minute search of the area produced negative intercept results.

II. Discussion of Incident

A check of adjacent radar sites revealed no unusual returns or activity in the area. The winds were generally from 240° below an overcast at 12,000'. Thus the object would appear to move against the wind since it must have been below the clouds. There was no air traffic reported in the area.

III. Conclusion

Unknown

San Antonio, Texas 9 January 1953

I. Description of Incident

At 2315 Z a civilian female source observed a small, round luminous, aluminum appearing flying object. It traveled at a high speed and disappeared after making a gradual climbing turn.

II. Discussion of Incident

The experience level of the source appears low.

III. Conclusion

Probably jet aircraft.

Sonoma, California 10 January 1953

I. Description of Incident

At 2345 Z two civilian sources observed one small flying object moving at a great rate of speed and performing violent maneuvers. The object's sound was similar to that of a jet aircraft. The object made three 360° right turns in nine seconds then performed abrupt 90° turns first to the right, then to the left. The object then stopped, accelerated to its former speed, rose vertically and disappeared.

II. Discussion of Incident

The only known aerial object capable of appearing to go through the described maneuvers would be a balloon; however, the time factors and velocity estimates do not support this conclusion.

III. Conclusion

Unknown

San Antonio, Texas 12 January 1953

I. Description of Incident

At 1555 Z two investigators for the Kelley AFB Air Police Office observed two soundless elliptical objects in the SE sky, over Kelley AFB. The objects were estimated to be traveling in a SE direction.

II. Discussion of Incident

One of the sources stated that the objects could have been balloons or inflated gas bags. There were two scheduled launches of large type weather balloons from the San Antonio area at 1500 Z.

III. Conclusion

Probably balloons.

Marysville, Tennessee 15 January 1953

I. Description of Incident

At 0145 Z a civilian source observed a balloon shaped object slowly decending towards the west for 30-40 minutes.

II. Discussion of Incident

During this period, there were many flights of upper air research balloons crossing this area.

III. Conclusion

Possibly a balloon.

Fremont, Texas 18 January 1953

I. Description of Incident

At 2400 Z a civilian source observed a large object slowly drifting to the southwest for several minutes at an estimated altitude of 600 feet.

II. Discussion of Incident

This report is very brief.

III. Conclusion

Insufficient data for evaluation.

Hiram, Georgia 21 January 1953

I. Description of Incident

At an unspecified time a civilian in Hiram, Georgia, observed a round object with a bright yellow tail travel soundlessly from south to north until it disappeared behind a cloud.

II. Discussion of Incident

Since the time of sighting is not specified it is impossible to check local aircraft traffic or balloon releases.

III. Conclusion

Insufficient data for evaluation.

Eau Gallie, Florida 21 January 1953

I. Description of Incident

At 1300 Z an unidentified source sighted three oval shaped, white objects six feet in diameter traveling in an unspecified direction at an estimated altitude of thirty feet.

II. Discussion of Incident

The report is exceedingly brief.

III. Conclusion

Insufficient data for analysis.

Harmon Air Force Base, Newfoundland 22 January 1953

I. Description of Incident

An unidentified flying object described as red, white and blue and oval-shaped, was observed visually from the weather station, control tower, base operations office, and a nearby AC&W site at Harmon AFB, Newfoundland, at 0040 Z. An attempt to contact the object by radar met with negative results.

II. Discussion of Incident

Local investigation precluded the possibility of the object being a balloon.

III. Conclusion

Insufficient data for analysis.

Patrick Air Force Base, Florida 22 January 1953

I. Description of Incident

At 2400 Z four airmen at Patrick AFB, Florida, visually observed for three minutes a fiery red-orange ball traveling soundlessly from north to south at high speed.

II. Discussion of Incident

The report is very brief. Therefore, ATIC has taken action to investigate the incident further.

III. Conclusion

Insufficient data for evaluation.

Continantal Divide, New Mexico 26 January 1953

I. Description of Incident

On 26 January 1953 at 2115 MST Air Force personnel stationed at an AC&W station in this area observed an aerial phenomenon simultaneously by electronic and visual means. To the naked eye the object appeared as a very bright reddish-white object estimated to be 10 miles west of the radar site. The object passed behind a hill and then reappeared apparently heading in a northerly direction at a slow speed. The airman making this visual observation reported it to personnel manning the radar equipment. They stated that they had an unidentified blip on the radar scope, appearing west of the station approximately 9 miles away. The scope showed the object to be on a 270° azimuth at an altitude of 10-15,000' moving away from the site at 12-15 mph. It was eventually lost on radar at the 18 mile range. The object was under visual and radar observation intermittently for 45 minutes. The elevation of the station is 7,500' above sea level.

Weather at the time was characterized by a high thin overcast and low scattered clouds. Winds aloft were from 270° at 30 knots at 10-30,000'. An atmospheric inversion layer existed at 18,000' with the top at 21,000'.

II. Discussion of Incident

This is the most complete report ever received by ATIC on the sighting of an unidentified object. The intelligence officer of the 34th Air Division, ADC, is to be complimented on his initiative and complete covering of all the angles bearing on the observation. Moreover, the combination visual-electronic sighting is the best type of sighting to work with because it affords the most information.

The intelligence officer preparing the report checked on weather balloon releases in the area of observation as a possible answer to the sighting. It was found that a 9' radiosonde balloon released from Winslow, Arizona, would offer the only possibility. The unknown object was observed to move from east to west, against the prevailing winds aloft which rules out the balloon theory. Also the sighting time of 0415 Z is 1 hour and 15 minutes after the Winslow release and by that time it is probable that the radiosonde had burst at altitude long before.

The fact that the object was detected on radar and seen visually for so long a period of time eliminates the possibility of an astronomical solution, such as a star or fireball, and especially if both radar and eye were seeing the same object, it is unlikely that these objects would cause radar returns. Since the object was tracked at 12 to 15 mph, aircraft are also eliminated as a possibility.

ATIC electronics specialists advanced the theory that the slow speed and large visual radar size of the target make it appear that weather effects may be the cause of the electronic pick-up. However, the inversion layer at 18,000' appears to be too high to effect the radar which was tracking the object at 10 to 15,000'. The weather-effect explanation cannot, of course, account for the simultaneous visual sighting. There is a possibility which ATIC is now checking

that the radar personnel may have been looking at the planet Venus, very low and bright on the western horizon at this time of year, and that the radar possibly encountered the aforementioned weather interference at the same time. This would require a high degree of coincidence, however, and the radar and visual sightings seem to coincide too exactly to give much weight to the theory that both were observing different objects.

Two other items added to the completeness of the report. ATIC supplied the reporting intelligence officer with a USAF Technical Information Sheet, or a visual questionnaire, and an Electronics Data Sheet covering the radar pick-up. Further analysis of this sighting awaits adiabatic weather charts for the date and area of sighting and until this information is received, this report is carried in Project Blue Book's files as an unknown.

III. Conclusion

Unknown

Sampson Air Force Base, New York 26 January 1953

I. Description of Incident

At 2320 Z an airman at Sampson AFB, New York, visually observed one large luminous rectangular shaped unidentified flying object. In one minute the object traveled through an arc of 70 or 80 degrees, while emitting a humming sound.

II. Discussion of Incident

The object above described appeared for only one minute, consequently analysis is very difficult. However, ATIC requested information concerning local aircraft and was told that a commercial flight was in the area around the sighting time.

III. Conclusion

Possibly aircraft.

Finland, Minnesota February 1953

I. Description of Incident

At 0629 CST an unknown object appeared on a radar scope on a heading of 155° at the 140° mile range. The object appeared on the scope as being twice the size of an ordinary aircraft.

II. Discussion of Incident

The radar station involved sent ATIC an Electronics Data Sheet covering the sighting and from this, electronics specialists determined that interference from another radar station caused the presence of the unknown "blip". No visual observation was made at any time.

III. Conclusion

Interference.

T53-3695

Saratoga Springs, New York 1 February 1953

I. Description of Incident

One large round, golden object was observed to be hovering down on the horizon at 2245 EST.

II. Discussion of Incident

No direction of object was given and furthermore the observers level of experience appeared to be low.

III. Conclusion

Insufficient data for evaluation.

SECRET

Terre Haute, Indiana

1 February 1953

I. Description of Incident

A military aircraft on a 270° heading 10 miles west of Terre Haute sighted a close group of moving lights changing color from red to blue, to green to yellow. The pilot estimated their altitude to range between 30,000 ft. to 15,000 ft. flying in a manner similar to conventional aircraft. Searchlights from the St. Louis area seemed to be following the unidentified lights. The time of sighting was about 2130 EST.

II. Discussion of Incident

ATIC made a check on local aircraft and found that there were many commercial and military flights in and out of St. Louis at the approximate time of sighting. It is possible that searchlights from St. Louis picked up one of these aircraft. The observing aircraft was 100 miles away from St. Louis which probably accounts for the changing color of lights.

III. Conclusion

Possibly aircraft.

T53-3695

56

Pepperrell AFB, Newfoundland 3 February 1953

I. Description of Incident

From 2100 to 2125 local time a low unidentified object resembling the landing light on an aircraft was observed by two airmen of this base until the object disappeared below the horizon. The observation was strictly a visual one with no optical aids and no radar contact.

II. Discussion of Incident

This is a very brief report with no information given on the experience level of the observers. From past experience, however, such sightings have been attributed to bright stars sinking below the horizon.

III. Conclusion

Possibly a star.

Yuma City, Arizona 4 February 1953

I. Description of Incident

At 1350 MST a meteorological aid for the U.S. Weather Bureau was searching for a lost weather balloon with the aid of a theodolite when he sighted a solid white, oblong object at a direction of 157.2° and elevation of 53.3°. The size of the object consisted of one minute of arc.

The object appeared to be ascending straight up, then levelled off and at this point was joined by a second object of exactly the same description. The second object left the field of the theodolite twice but returned each time to join the original. They both disappeared simultaneously at an angle of 204.1° at an elevation of 29.1°. At 204.1° the sky was covered by cirrus clouds at approximately 25,000 ft.

The objects remained in vision for five minutes. The observer stated that the objects rose more rapidly than any balloon he has ever seen and furthermore moved against the prevailing westerly winds. There appeared to be no glimmer or reflection from the sun from the objects.

II. Discussion of Incident

From the observers obvious experience in tracking balloons, it is concluded that these objects could not have been balloons especially since they were seen to move against the wind. There were aircraft in the area but the observer states he was aware of them and could not have confused them with the unknown objects. Because of the maneuvers and the time of day, astronomical activity must be ruled out. ATIC has not been able to find an answer to this sighting.

III. Conclusion

Unknown.

T53-3695

Guam (Truk Island) 6 February 1953

I. Description of Incident

At 1110 local time an Air Force officer in charge of the Weather Bureau Station on Truk sighted an unidentified bullet-shaped shiny object traveling an estimated 150 mph at an approximate altitude of 400 to 500 ft. three to four miles away. The object appeared to be "slightly larger than a C-47 aircraft" with no noticeable wings or tail section and gave a shiny appearance as if of highly polished metal.

II. Discussion of Incident

A check with Guam flight service indicates that a C-47 was in the area at the time of sighting. The day was clear with a bright sun capable of distorting the normal features of a C-47.

III. Conclusion

Probably aircraft.

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UNCLASSIFIED

Rosalia, Washington 6 February 1953

I. Description of Incident

A B-36 aircraft was in flight in the vicinity of Spokane, Washington, when one round white omnidirectional light was sighted at 0913Z time. The light was at an altitude of approximately 7,000 ft. on a southeast course circling and rising as it proceeded. It was visually observed for a period of three to five minutes. The B-36 made 180° descending turn toward the light which was estimated to be moving at a speed of 150 to 200 knots. The aircraft was inbound to Spokane 15 miles out and located over Rosalia, Washington.

II. Discussion of Incident

ATIC determined that a scheduled piball balloon released at 0900Z from the U.S. Weather Bureau Station at Fairchild AFB was in the immediate area of sighting. The sighting was from Rosalia which is 12.5 nautical miles S.E. of Fairchild AFB and to place a balloon in the area of the sighting winds would have to be out of the N.E. Winds aloft at 7,000 to 10,000 ft. were from 270° to 280° at 50 knots per hour. Therefore, by computation, it would take approximately 15 minutes for the balloon to be carried to Rosalia by the existing winds. Since the unidentified object was sighted 13 minutes after the balloon launch time, and the description (climbing, orbitting, balloons carry white running lights) closely parallels the maneuvers of a balloon, ATIC concludes that the object probably was the piball weather balloon. All local air fields were checked by McChord AFB and no aircraft were in the area at the time of observation other than the B-36.

III. Conclusion

Probably balloon.

UNCLASSIFIED

T53-3695

60

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Okinawa 7 February 1953

I. Description of Incident

At 2122 local time radar tracked an unidentified object for 15 minutes and alerted a local interceptor squadron. An F-94 scrambled at 2123 hours, climbed to 15,000 ft., picked up nothing on airborne radar but at 2145 did make visual contact with a bright orange colored object which seemed to change to red and green at a special interval. Object was seen by the pilot and the R.O. for approximately 15 minutes after which it disappeared behind a cloud at an azimuth of 290°, low on the horizon.

II. Discussion of Incident

The weather consisted of scattered stratus clouds. No information is available on atmospheric phenomena such as temperature inversions or moisture-laden clouds which could have given a spurious radar return. It was determined at the base making the report that the F-94 had sighted the planet Venus which is extremely bright at this time of year and which also is located at a 275° azimuth from Okinawa 10° above the horizon. It is probable that merely by chance ground radar received a spurious plot on its scope and accordingly vectored the F-94 to a position where Venus was very apparent. No strict correlation between the electronics sighting and visual contact can be made.

III. Conclusion

Probably Venus.

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UNCLASSIFIED

Barter Island, Alaska

8 February 1953

I. Description of Incident

Two pilots from this station made a ground-visual observation of an unidentified aerial object coming in over their base in a falling leaf pattern from the west. Time of the observation was 0450 local. It hovered, consisted of brilliant orange white lights seen for a period of eight minutes after which the object climbed eastward and disappeared. Throughout it gave off a noise similar to a helicopter's and was estimated by the viewers to be the approximate size of a C-47 aircraft.

II. Discussion of Incident

This report is on the brief side and gives no information on air traffic at the time of sighting. It is possible, however, that the above-average sources may have observed a helicopter and became confused. Any evaluation will have to be based on additional information on helicopter traffic which ATIC has requested.

III. Conclusion

Insufficient data.

Dobbins Air Force Base, Georgia 8 February 1953

I. Description of Incident

Military personnel observed a red-yellow-white stationary object from this base as well as Knoxville, Tennessee, at 2145 EST which was observed for 15 minutes before slowly disappearing below the horizon. It appeared in the west and was brighter than red obstruction lights on the control tower at Dobbins.

II. Discussion of Incident

No triangulation from the two observing points was made which would have been extremely helpful and should be attempted in sightings such as this. The description and manner of disappearance strongly suggests astronomical sightings at Presque Isle AFB and Mitchel AFB in October and December of 1952.

III. Conclusion

Probably astronomical (bright evening star).

Tunis, Libya 11 February 1953

I. Description of Incident

An unidentified object was observed by the crew of a C-119 aircraft while enroute to Tripoli from Tunis. The object appeared very bright with a halo of diffused light surrounding it and was observed off the right wing of the aircraft flying at 7,000' on a 170° heading making I.A.S. of 170 knots. Length of observation varied from 5 to 55 minutes by assorted members of the crew some of whom stated that it appeared to ascend and then descend slowly.

II. Discussion of Incident

Four out of six of the crew stated that, in their opinion, the object was not a star, whereas the remaining observers would not commit themselves on a conclusion. Since the sighting seemed to be astronomical in nature, Project Blue Book submitted it to its contract astronomer, standard operating procedure in such cases. It was determined that Venus was probably responsible for the observation in that it appears at an approximate 200° azimuth in Libya on this date, and under fair weather conditions would appear very bright. The fact that it remained almost stationary and was observed for a long period of time would support this conclusion.

III. Conclusion

Probably Venus.

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Lake Charles AFB

12 February 1953

I. Description of Incident

A bluish-white object with a tail was observed by six Air Force personnel in a combined air-visual and ground-visual sighting. Time of sighting was for a very short period, a matter of seconds. The air crew involved estimated that the streaking object was on a level with them and 20 miles distant. The object was compared to"a flaming rag thrown in the air". There was no sound whatsoever.

II. Discussion of Incident

Weather conditions at the time of sighting (0600 CST) were CAVU and facilitated easy spotting of meteors. This sighting was undoubtedly caused by the passage of a meteor or "fireball" through the earth's atmosphere which had unusual coloring.

III. Conclusion

Probably astronomical.

Ramier, Alabama

16 February 1953

I. Description of Incident

Two civilian men at this location sighted an unidentified object as 1630 EST while watching the flight of a B-47 aircraft cross their field of vision. A metallic looking object appearing round at one instant and flat the next was seen at an altitude of about two-thirds that of the B-47 which ATIC learned was at 35,000 ft. Its maneuvers consisted of climbing, diving, and sharp angle turns to the left and right in and around a few scattered clouds and it appeared to be faster than the B-47. Total time of sighting was for 20 minutes.

II. Discussion of Incident

Although the Maxwell Radio Range Station reported no known aircraft other than the B-47 in the area ATIC feels that, on the basis of the description submitted by the two relatively inexperienced observers, they probably sighted a fighter type aircraft, possibly an F-86, maneuvering in the air space below the B-47. To support this conclusion is the fact that the clouds mentioned in the original report around which the object was sighted, were determined to be at 20,000 ft. At this altitude a fighter aircraft would be hard to distinguish. The observers did state, however, that the object appeared to have swept-back wings.

III. Conclusion

Possibly aircraft.

Port Austin, Michigan 17 February 1953

I. Description of Incident

At 2204 EST an unidentified aerial object was sighted visually by members of an AC&W Squadron at Port Austin. The object was eight to ten miles northwest of their station at an estimated 100' above the horizon. It appeared to be larger and brighter than a star and other than changing color, there were no unusual features visible. The object was moving south at a low rate of speed and eventually faded out completely after becoming much less bright in intensity. This object was viewed visually from 2204 EST for five minutes until 2209 EST.

At 2208 EST, the observers tracked the object on a search radar set. Position of the object on the radar set was 300° moving in a 180° course at 55 knots. The object was observed at 2208 EST for 17 minutes until 2225 EST. No height finding equipment was available at point of observation, but the observers estimated the altitude at 1000' from the radar returns. Weather conditions at time of sighting were: visibility and ceiling - unlimited, with moderate winds from the west.

II. Discussion of Incident

The possibility of the reported object being a balloon was checked by the reporting officer. The nearest balloon launch station is at Waukegan, Michigan, which is 140 miles from Port Austin. A piball type balloon was released from Waukegan at 0300Z. It is not likely that this balloon caused the sighting because the object in question was sighted at 0304Z.

Both the visual and electronic sightings were made by the same personnel, consisting of two officers and three airmen. All of these men have three or more years experience in radar. A radar scope camera was installed, but was not in operation at the time of sighting.

No known meteorological disturbances or activity existed at the time of sighting, or at any time that day.

After checking with surrounding bases and flight plan sources, it was found that there were no known aircraft in the general area.

The planet Venus is very low on the northwest horizon at this time of year and is easily seen. This fact might explain the visual sighting, but Venus will not show on a radar scope.

Further analysis of this sighting awaits adiabatic weather charts for the date and area of sighting. Until this information is received, this report is carried as unknown.

III. Conclusions

Unknown

Fortville, Indiana 23 February 1953

I. Description of Incident

At 2116Z time a civilian woman located 16 miles northeast of Indianapolis sighted an unknown flying object appearing as a circular shaped, white object traveling at a high altitude in a northeasterly direction and reported this occurrence to the 782nd AC&W Squadron, the nearest Air Force installation. Clear weather prevailed.

II. Discussion of Incident

Project Blue Book ascertained that a piball weather balloon was scheduled for release at 2100Z by the Indianapolis U.S. Department of Agriculture Weather Station and probably caused the submission of this report. The object was seen approximately 15 minutes after the balloon's release from Indianapolis and was carried in a northeasterly direction by the winds aloft which, for that time of day were from 240° to 260°. This would place the free-floating 30" rubber balloon almost over Fortville, the location of sighting.

III. Conclusion

Was balloon.

Dayton, Ohio 24 February 1953

I. Description of Incident

A civilian woman contacted ATIC concerning a yellowish-white object which she had observed at 0430 EST for two successive days for periods ranging from 3 to 30 minutes. The object was described as oblong shaped and very low on the horizon with the manner of disappearance in both sightings being caused by its sinking below the horizon. The object was seen at a due west position each time.

II. Discussion of Incident

The source, although of average intelligence, is not an experienced observer and it is quite certain that she witnessed the setting of an astronomical body such as Venus.

III. Conclusion

Probably astronomical.

Great Falls, Montana 25 February 1953

I. Description of Incident

A civilian man from this location sighted an unidentified aerial object on three separate occasions - 25 Feb 53 at 0025Z, 5 Mar 53 at 2115Z, and 6 Mar 53 at 1932Z.

II. Discussion of Incident

Very little information has been gathered on this sighting, even a basic description of the object's appearance has not been submitted to Project Blue Book. Furthermore, nothing is known of the observer's experience level, corroborative witnesses, etc. In the light of the scant information received, the report has to be carried as insufficient data for evaluation until an AF Form 112 arrives.

III. Conclusion

Insufficient data.

Pepperrell Air Force Base, Newfoundland 26 February 1953

I. Description of Incident

An Air Force major and enlisted personnel from this base observed a green object with a trail of sparks traveling downward at a high rate of speed and disappearing behind mountains to the east. The size of the object was compared to that of the moon. Time of sighting was 1910 local time and the existing weather conditions were generally good.

II. Discussion of Incident

Project Blue Book's contract astronomer is of the opinion that the object seen was an exceptionally bright meteor. The size of the object has probably been overestimated. Two factors substantiate the meteor conclusion in this case: 1) the fact that it followed a downward course and 2) that it gave off sparks, two characteristics of a common meteor. No length of observation was given but it probably was a matter of seconds.

III. Conclusion

Probably a meteor.

Klamath Falls, Oregon 26 February 1953

I. Description of Incident

At 2159 PST a round red stationary object was sighted by a CAA operator for 10 minutes time. The object seemed to fade in and fade out intermittently and eventually faded out completely. The observer estimated the unknown to be at a 270° azimuth from his position and at an altitude of 10,000'. Weather at the time of sighting consisted of scattered clouds at 2,000' with 10 miles visibility.

II. Discussion of Incident

Project Blue Book and its contract astronomer evaluate this report as definitely caused by the astronomical body Venus. Many similar reports have been received by ATIC during February of an object in the western sky appearing to change color and fading intermittently, and almost all such r eports have been found to be Venus.

It is interesting to note in this and other similar observations that experienced CAA and Air Force personnel have been understandably confused by this bright planet, comparatively isolated, low on the horizon and sometimes seen through a high haze layer causing a rapid change in color. Red is the color given most often.

III. Conclusion

Was Venus.

Dover Air Force Base, Delaware 26 February 1953

I. Description of Incident

At 2130 EST a dull red colored light was observed low on the western horizon by several military personnel. The light was slowly moving from west to northwest alternating color from yellow, green, red, and back to white. After being observed for approximately five minutes, object disappeared below the horizon.

II. Discussion of Incident

Observers were, in the opinion of the preparing officer, reliable. At the time of sighting, weather was clear, visibility eight miles. F-94's in area on other missions noticed nothing unusual. Due to the fact that the light was seen moving from west to northwest low on the horizon and then to disappear over the horizon and that the planet Venus can be seen in that direction very plainly during this part of the year, it is quite certain that the light observed was Venus. ATIC's contract astronomer was consulted and he concluded that the object observed was definitely Venus.

III. Conclusion

Astronomical - Venus.

Dover Air Force Base, Delaware 28 February 1953

I. Description of Incident

At 2121 EST four AF personnel observed a single light of alternating colors with red predominant. The light was due west of Dover Air Force Base and about 20° above the horizon pursuing a very gradual course from west to northwest. No sound, smoke or vapor was observed. It appeared to fade away or disappear over the horizon. There was no air traffic in the area.

II. Discussion of Incident

As in the case of the Dover sighting of 26 Feb 53, it was the opinion of ATIAE-5 that Venus caused this sighting. ATIC's contract astronomer was contacted and definitely concluded that it was Venus.

III. Conclusion

Was Venus.

Richmond, Virginia 28 February 1953

I. Description of Incident

At 1800 EST an Air Force colonel while traveling at 60 mph in his auto near Richmond observed a flash of metal with a long narrow rectangular contrail traveling from south to north. The object crossed the path of the auto from left to right traveling at less than jet speed. The object was observed approximately 15 minutes.

II. Discussion of Incident

Observer visited a friend of his about 1 hour later. The friend initiated the conversation by stating that he had seen a bright contrail in the sky about 1800 at a considerable distance. At 1800 EST on this date the sun was setting. The sun, reflecting from contrail, made it easily visible.

III. Conclusion

Probably contrail of jet aircraft.

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PROJECT BLUE BOOK - REPORT NO. 11

FORMERLY PROJECT GRUDGE

PROJECT NO. 10073

31 MAY 1953

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WRIGHT-PATTERSON AIR FORCE BASE
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STATUS REPORT

PROJECT BLUE BOOK - REPORT NO. 11

Formerly Project Grudge

PROJECT NO. 10073

31 May 1953

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AUTH: COMDR ATIC
BY: H.C. Johnston
Lt Col, USAF
DATE: 7 Jul 53

This report is the eleventh of a series of tri-monthly status reports on Project Blue Book covering the months of March, April and May.

Any additional information may be obtained on any incident by directing requests to the Commander, Air Technical Intelligence Center, ATTN: APOIN-ATIAE-5, Wright-Patterson Air Force Base, Ohio.

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SECRET

STATUS OF PROJECT BLUE BOOK

I. OVERALL STATUS

A total of 89 reports of unidentified aerial objects were received by Project Blue Book during the period covered by Status Report No. 11 (March, April, and May 1953). A total of 188 reports were submitted for December, January, and February; the general influx has therefore dropped noticeably with the exception of the month of March 1953.

In March, 59 FLYOBRPTS were received, 53 percent from military observers, the remaining from civilians in various walks of life. Known astronomical phenomena accounted for 21 of the sightings or approximately 35 percent, with the planet Venus the established cause of 16 flying object reports. Venus appears low on the horizon at this time of year and is unusually bright; it is possible for it to appear to change color and perform erratic maneuvers when seen through thin clouds or ground haze. In this connection it is interesting to note that experienced military pilots reported this phenomena in four instances as an unidentified aerial object. However, the majority of proven Venus sightings were turned in by members of the Ground Observer Corps. One was reported by an airlines pilot.

During the last three months of operation, Project Blue Book has received an average of 10 reports per week which is considerably under the five FLYOBRPTS per day submitted during the fall of 1952. The volume of reports during the spring of 1953 has been the lowest in the last two years and it is believed the generally inclement weather throughout the United States has had much to do with this.

It is also the opinion of Project Blue Book, however, that one highly publicized sighting could again trigger off another "saucer" scare with resulting pressure on the Air Force and ATIC. The direct relation between newspaper publicity and the number of reports submitted has been firmly established by Project Blue Book. In this connection and because of latent public interest and possible hysteria which are believed to exist, ATIC is currently preparing a statement on unidentified objects which will be issued by P.I.O., Washington, D.C., at the first indication of publicity. It will give a full account of ATIC's findings, including percentage of unexplainable reports, percentage of known objects or phenomena such as aircraft, balloons, radar interference, etc. Thus the Air Force cannot be accused of withholding information. It is ATIC's policy to keep the public fully informed.

A complete statistical study of all reports from 1947 to 1952 is now in the final stages of I.B.M. preparation. A final report is expected on 15 August 1953. It will include statistical probabilities and indexes of comparisons on unidentified objects and a general commentary of the conclusions reached by the study, the first effort ever made to treat sightings mathematically. A total of over 3,000 reports will be processed in this study.

Another item of importance occurring during the period of this Status Report was the completion of a briefing tour of Air Defense Command units by Project Blue Book. This will be examined in further detail on following pages.

Project Blue Book continued to screen and evaluate all reports as soon as possible after being received. The following represents a breakdown of the number of reports by month and the percentage breakdown of evaluations;

	Conclusion	No.	Percentage
March:-	Astronomical	21	35.6
	Balloon	7	11.8
	Aircraft	8	13.6
	Insufficient Data	12	20.3
	Other *	8	13.6
	Unknown	3	5.1
	Total	59	100.0
April:-	Astronomical	4	25.0
	Balloon	1	6.2
	Aircraft	5	31.3
	Insufficient Data	3	18.8
	Other *	1	6.2
	Unknown	2	12.5
	Total	16	100.0
May:-	Astronomical	1	7.1
	Balloon	5	35.8
	Aircraft	4	28.6
	Insufficient Data	1	7.1
	Other *	2	14.3
	Unknown	1	7.1
	Total	14	100.0

January	63
February	75
March	59
April	16
May	14
Total	227 Reports

* Water reflections
Strange cloud formations
Sun-Moon dogs
Flying paper, etc.

An average of 45 reports received monthly since the first of 1953. 10% of all reports in 1953 are classified as unknown.

II. CANADIAN FLYING SAUCER

In the 11 February 1953 edition of the "Toronto Star" there appeared an article entitled "Canadian Flying Saucer". This article stated that a revolutionary type aircraft had been produced at the Avro Canada's Malton, Ontario, factory. This aircraft was reported to have a speed of 1500 mph, and that vertical takeoff and hovering would be possible.

Project Blue Book attempted to obtain more information through the Air Attache in Ottawa. The reply stated that there is no reason to believe that a "flying saucer" is under development in Canada at the present time.

A. V. Roe, Limited, of Toronto, Canada, have indicated that they are interested in developing a supersonic type of aircraft. This has not progressed to more than a sketch stage of development, and would probably not be ready for the drawing board until two or three years from this time.

Numerous articles have appeared in the Canadian press regarding the subject that have given little new information. However, the most puzzling information came through USAF channels. The USAF has been informed by a confidential source that a Canadian engineer, the designer of a Canadian all-weather interceptor, is the designer of this "saucer". The source states that RCAF officers have visited the A. V. Roe factory where he works and have seen a demonstration of a model. The subject engineer claimed that he has flown this model which is 12 inches to 18 inches in diameter from Malton Airfield.

Considering the report from the Air Attache and the conflicting report by the confidential source concerning the unconventional aircraft, the veracity of the designer and/or the "confidential source" are open to some question in the opinion of Project Blue Book. The Canadian press has given the subject wide publicity and many of the resulting "facts" may be the result of wishful speculation on the part of the newspapers.

However, Project Blue Book is continuing an active interest in this matter and is making every effort to get the true facts.

III. THE AIR DEFENSE COMMAND BRIEFING TOUR

In the fall of 1952 ATIC and Hq ADC agreed upon a plan whereby ATIC's Project Blue Book would brief all interested units in ADC on its operations. On 9 March 1953 the Western Air Defense Force was briefed; on 18 April 1953 the Central Air Defense Force was briefed; and on 8 May 1953 a Project Blue Book briefing was given to the Eastern Air Defense Force.

A survey of all FLYOBRPTS received by ATIC in 1952 revealed that the Air Defense Command was responsible for 40 percent of all reports received. In the light of this, it was felt highly desirable to acquaint the units of the Air Defense Command with the following two points:

1. Project Blue Book's general background, objectives, and progress.
2. How the ADC intelligence officer could assist Blue Book by submitting more detailed and accurate reports, stressing the points needed for analyzing a sighting.

In a general evaluation of the effect of the ADC briefing tour, it is believed that it was extremely successful in accomplishing the above objectives. Project Blue Book feels that intelligence officers in ADC are now better equipped to handle problems concerning aerial phenomena. Interrogation forms covering ground observations, as well as electronic detections, were distributed to each division visited.

It was found that many of the reports submitted to each of the Forces were from GOC personnel and although a certain percentage of these reports would be classified by ATIC as "good", the majority of them involved reporting known phenomena by an inexperienced source. GOC officers were told to institute

an educational program on unidentified aerial objects in order to decrease the volume of reports of known objects. They were given copies of the briefing itself which outlined the outstanding known causes of "flying saucer" reports and were asked to circulate this information to the filter center and observers.

Another point stressed by the briefing was the fact that analysis and conclusions on a sighting could be accomplished by ADC personnel themselves. ATIC encourages the preparing officer of a FLYOBRPT to attempt to arrive at a conclusion as to what caused the report of an unidentified object. They were advised of the main categories of conventional objects which cause reports, such as balloons, aircraft, and astronomical bodies. A general opinion held by all officers in ADC was that the required AF Form 112 as per AF Letter 200-5 causes a great deal of excessive clerical work. They suggested that the subject Form 112 should be eliminated entirely. They stated that in many instances that Hq ADC required many file copies of both the TWX and the AF Form 112, and that this substantially reduced the number of reports submitted to ATIC. In many installations there are simply not enough clerical personnel to do the work. The results of this suggestion and ATIC's opinion will be examined in the following item.

IV. REVISION OF AIR FORCE LETTER 200-5

Air Force Letter 200-5 as it reads at the present time requires that all TWX's to ATIC on an unidentified flying object will be followed within 72 hours by a written Form 112 which elaborates on the sighting. It is felt that the Form 112 is superfluous when the sighting can be explained from the TWX alone which, if the TWX has relatively complete information, is usually the case 70 percent of the time. In view of this, ATIC is currently amending Air Force Letter 200-5 to state that just a TWX will be sent in on an original FLYOBRPT and if ATIC feels that more information is needed it will in turn contact the reporting unit and ask them for the Form 112. The new requirements for a TWX will request more complete information than was previously asked.

V. CONTRACTOR STATUS

Project Blue Book has a contract with a civilian research organization which serves the project with an IBM analysis of all unidentified aerial object reports and technical analysis of any specific problems submitted. Coding and evaluation of all reports from 1947 to 1952 has been completed and the formal IBM study is now being run. Up to and including 1952, 2,500 reports were received through military channels. This number does not include many letters reporting sightings sent in by the public at large. Trial questionnaires were sent out to the most reasonable of these letters during the summer of 1952, when reporting was extremely high. Approximately 1,000 of these questionnaires were completed and returned to Project Blue Book and are now being incorporated into the IBM analysis. Thus 3,500 sightings of unidentified aerial objects will be studied.

One two-day evaluation conference was held during 4 March and 5 March 1953. Two representatives from the Air Technical Intelligence Center and three representatives from the contract organization participated in this conference and processed 265 reports. These reports were given final evaluations before

being submitted to the IBM study. On 24 and 25 April 1953 another two-day evaluation conference was held; 350 reports were examined jointly and given final evaluation.

The IBM contractor has estimated that a final report will be submitted to Project Blue Book on 15 August 1953 in which statistical curves of probability, indexes of comparison on unidentified objects, and a general commentary on the results of the IBM study will be included. It is believed that this study will be extremely significant in the future evaluation of reports of unidentified objects and perhaps to the operation of Project Blue Book itself.

VI. VIDEON CAMERA STATUS

On 1 June 1953, 73 Videon cameras were distributed to AACS tower sites and ADC radar sites strategically located throughout the United States with relation to frequency of FLYOBRPTS. The original plan for these cameras was to take a photograph of an object through both an open lens and a lens equipped with a diffraction grating. The diffraction grating would enable a spectroscopist to attempt to identify the object in question by means of a spectrum bar recorded on the film. It was found, however, that the diffraction gratings began to deteriorate soon after being received by ATIC. It was concluded that the cameras would be sent out without gratings immediately as an instrument for obtaining photographic intelligence on unidentified objects. When a suitable grating is obtained, the cameras will be recalled from the field and the subject grids mounted.

VII. INSUFFICIENT DATA REPORTS

For the year 1952 22.7% of all reports were classified as insufficient data for evaluation, or not containing enough information to even attempt an analysis. Thus far in 1953 this category has reduced itself to 15.4%. This is a noticeable improvement, but still is believed to be too high.

Upon receiving such a report, ATIC usually TWX's the originating base, but in the past has received little additional information. The problem is significant enough to mention in this Status Report in an attempt to decrease the number of reports with nebulous information. Quoted below is a FLYOBRPT received by ATIC which had to be classified as insufficient data to evaluate: "FLYOBRPT round with tail, yellow, similar in size and shape to hub cap, leaving trail of bright yellow fire with no observed propulsion system nor any sound being heard. In straight flight bearing slightly downward, speed very slow. Object disappeared behind cloud. Visual sighting by individual in Hiram, Georgia. Object was sighting north of observer and was traveling from south to north to the left of Marietta, Georgia. Report submitted by a civilian source, Hiram, Georgia. Winds aloft 10000-250/45K: 20000-260/55K; 30000-260/70K; 40000-260/80K."

The reported object could be astronomical in nature, possibly a meteor. Its slow movement seems to conflict with this solution, however. The information essential to analyzing this sighting follows: 1) What time was the object seen? 2) How long was it seen? 3) What was its azimuth and elevation at appearance and disappearance? 4) Angular velocity across the sky. 5) The name

and address of the individual making the sighting so that a questionnaire could be sent. 6) The reliability of the source; were there other observers? 7) Local air traffic. 8) A check with base weather service to determine if weather balloons or any other phenomenon known to them could solve the sighting. 9) Weather conditions, including cloud coverage, light conditions, temperature or dew point inversions.

Most of the above points are contained in the requirements for a TWX as per AFL 200-5 which was not followed in this instance.

A good feature of the report is the fact that winds aloft are given. The most essential item is left out, however, and that is the length of observation. If this was a matter of seconds, the sighting was probably a bright meteor.

VIII. SYNOPSIS OF REPORTS

An individual summary of ten characteristic FLYOBRPTS for March, April, and May follows.

Darlington, Wisconsin

31 May 1953

I. DESCRIPTION

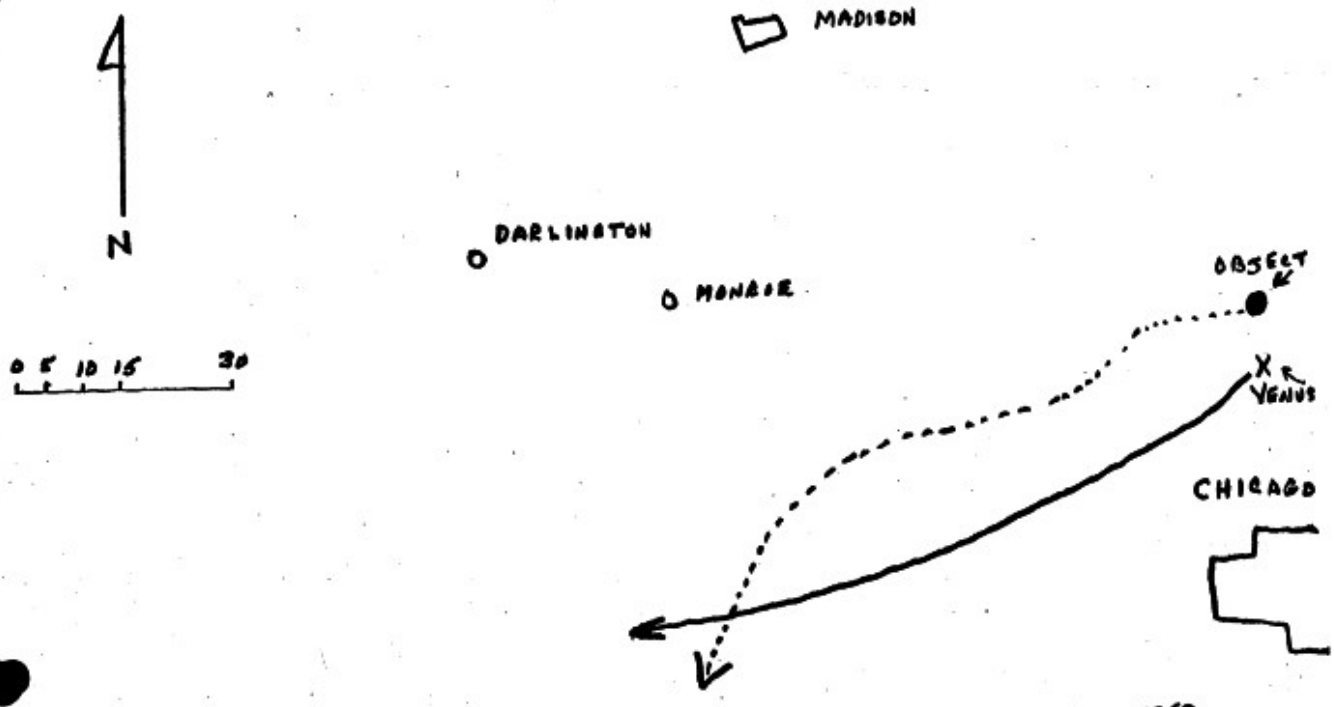
Between 0320 CST and 1130 CST on 31 May 1953, eleven persons in the Darlington-Monroe area in Wisconsin sighted an unidentified aerial object. The object appeared as a steady white light coming generally out of the East and disappearing high overhead after 8 hours of continuous observation. It appeared low on the Eastern horizon, much brighter than the surrounding stars. It was reported to hover and then move at terrific speeds by several local inhabitants, including several county sheriffs and Ground Observer Corps members. Two of the policemen pursued the object in their squad car without gaining any noticeable ground. A telescope was employed to view the phenomenon by the GOC members. The weather during the time of sighting was unusually clear with a few scattered clouds carried on a north heading by the wind.

II. DISCUSSION

A newspaper account of the sighting came to the attention of ATIC and as a result an officer and an astronomer were sent to the area of the sighting. They interrogated eight of the eleven observers in attempting to piece together the variety of reports. Estimates of azimuth and elevation readings were obtained from different observers at varied locations in Monroe and Darlington for evenly spaced time intervals during the 8 hour period. The description of the object turned out to be the same with all observers - bright white. The description of the maneuvers varied, however, some stating the object rose slowly, others saying it moved at great speeds, and then hovered. The latter description usually came from observers while riding in a car. All agreed that the object was too bright to be a star and moreover it was seen in the daytime.

It was determined that the path of the object in question across the sky, its position at appearance and disappearance, very closely paralleled the path of the planet Venus on 31 May 1953. Venus on this day rose at 0310 CST and was at its approximate maximum brilliancy. Under ideal weather conditions it can be seen in the daytime, although this is rare. The fact that GOC personnel first sighted it at night and had the object pin-pointed for daylight observation allowed them to keep it under constant surveillance. Reports that the object manuevered radically usually came from persons driving in cars while observing the object. If Venus is stared at for any length of time without any balancing reference point, it can appear to perform erratic maneuvers.

GOC personnel alerted the Chicago filter center and jets were scrambled to investigate. This was during daylight observation and the jets, although vectored toward the object by visual directions from Darlington, were unable to locate the unknown.



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III. CONCLUSION

Was Venus.

Inyokern, California

16 May 1953

I. DESCRIPTION

The Inyokern Naval Air Facility at the Naval Ordnance Test Station received a report from one of their civilian employees that three cream colored objects were overhead at 1810 PST, and disappeared to the northeast climbing rapidly. Altitude was estimated to be approximately 20,000 feet while over Inyokern. Objects appeared to be round and balloon-like with strings hanging down. No photographs were taken, exhaust or method of propulsion was undetermined, and no interception was attempted. Several other civilians at that station also observed these objects.

II. DISCUSSION

This information was taken from a TWX received from the Flight Service Center at March AFB. Many details are lacking. The description as given by this one civilian fits that of three upper air research balloons (Moby Dick) tied together. More information will be available when the USAF Form 112 is received. Also, Project Blue Book receives the plots for all Moby Dick type balloons released in that area. The Project Blue Book evaluation of possibly upper air research balloon can be substantiated or cannot be substantiated upon receipt of the balloon plots.

III. CONCLUSION

Possibly balloon (Moby Dick).

Calumet, Michigan 19 April 1953

I. DESCRIPTION

On 20 April 1953 between 0118Z and 0215Z a series of targets were sighted by the 665th AC&W Squadron, Calumet, Michigan. The plots originated approximately 50 miles from their station, from 050° clockwise to 251°. Speed was from 1800 mph to 8400 mph. This sighting was a radar sighting only and appeared as a normal target except for speed. No abrupt maneuvers were noted. Several individual targets were noted. This squadron was using an AN/FPS-3 type search radar unit, with a Thyratron modulator. There had been no maintenance difficulties. The general weather conditions at the time of sighting were three miles visibility, snow and overcast. Northern Lights were clearly visible during this period.

II. DISCUSSION

This is another of the better type of FLYOBRPT. The intelligence officer is to be commended for the initiative shown in making as complete a report as was possible under the circumstances. He made the preliminary evaluation at the time he prepared the report, saving Project Blue Book the time and effort it takes to investigate a sighting of this type. His evaluation was . . . . "Targets are believed to be interference from shipborne radar, originating on Lake Superior".

III. CONCLUSION

Other (radar interference).

~~SECRET~~

Sweetwater, Nevada UNCLASSIFIED 12 April 1953

I. DESCRIPTION

At 1510 hours PST, ten round flat metallic colored objects changing formation traveled at an estimated high rate of speed on a heading of 110° at an estimated altitude of 7,500 ft. No trail, sound, or exhaust were noted. Objects passed under the right nacelle of the observers' C-47 type aircraft, and were observed by the co-pilot. He took control of the C-47, and turned to the right in a tight 300°turn for a better view of the objects. Objects were then picked up unassisted by two more members of the crew. The objects were observed in a right turn of greater radius than that of the C-47, and at a lower altitude. The objects were observed for approximately 120° of their turn, and disappeared on a heading of 300°. Observers were unable to estimate the speed of the objects because of the distance and the objects' large radius of turn.

II. DISCUSSION

No aircraft were observed in the area and the pilot reported no radio facilities at Sweetwater Airport. No report was made until landing at Stead AFB, Nevada. Weather at the time of sighting was slightly hazy, visibility 30 miles. Although the observers reported seeing no aircraft in the area, it is believed that the objects were aircraft (probably trainers) because of the color, maneuvers, and distance at which they were observed.

III. CONCLUSION

Possibly aircraft.

Sondrestromfjord Air Base, Greenland 8 April 1953

I. DESCRIPTION

At 2300Z two observers flying a MATS aircraft reported sighting an unidentified white light 110 miles SW of Sondrestrom Air Base, Greenland. The estimated speed of this light was 1000 mph, altitude estimated to be 15,000 ft. and direction of travel 0°. The object maintained a steady course, but seemed to be in a shallow descending turn. The observing aircraft was at 9000 ft. with an airspeed of 165 knots and a true heading of 30°. The white light was observed on the starboard side at 50°, fading out at approximately 20° to the right. Total time of the observation was approximately three seconds at a distance of 50 to 100 miles.

II. DISCUSSION

Flight plans were checked with Sondrestrom AFB, Narsarssuak AFB and the Iceland Defense Force with negative results. It was the opinion of the Director of Intelligence, NEAC, that this sighting was caused by a celestial phenomenon. The description of this light fits that of a meteor, except that a meteor very seldom appears white. However, Project Blue Book concurred with the NEAC evaluation when its contract astronomer also was of the opinion that the phenomenon was astronomical in nature.

III. CONCLUSION

Probably astronomical (Meteor).

Harmon AFB, Newfoundland

19 March 1953

I. DESCRIPTION

At 0830Z, 19 March 1953, a diamond-shaped, bright white object with small extensions at each point of the diamond was observed for 60-90 seconds approximately 25° above the eastern horizon. It appeared to be traveling at 300 mph at an estimated altitude of 2500 ft. heading on a westerly course. Unusual maneuvers consisted of a short pause, disappearing three times, one or two seconds each time, and finally disappearing instantly overhead. The observer was a USAF captain with considerable experience in navigation.

II. DISCUSSION

Since there were no known aircraft in the area, and there was no unusual astronomical behavior, the object was given a preliminary evaluation of possibly balloon, until weather balloon information could be obtained from Asheville Weather Central. The following day, a TWX was received by Project Blue Book from the base intelligence officer at Harmon AFB. "Indications are that sighted object was a weather Rawinsonde Balloon with attached light which was released at the time of the sighting." Such action on the part of the base intelligence officer is greatly appreciated by Project Blue Book, for it saves ATIC considerable cost and effort in determining the nature of the phenomena.

III. CONCLUSION

Was balloon.

Greenville, Mississippi 13 March 1953

I. DESCRIPTION

From 1745 CST, until 2015 CST, one round, silver blue object that emitted light from two points on its surface was observed over Greenville, Miss., by both civilian and military personnel. Said object changed direction from west to south to north and back to west. No interception was attempted. The size, speed, sound, and altitude were not reported.

II. DISCUSSION

Maxwell AFB and Memphis NAS Direction Finding Units fixed the position of a Moby Dick (upper air research) balloon in the area at the time of sighting.

III. CONCLUSION

Probably upper air research balloon.

Kent Hill, Maine 7 March 1953

I. DESCRIPTION

At 2202 EST, 7 March 1953, ten students and three instructors located at Kent Hill, Maine, observed an unidentified object on a bearing of 290° from them. It appeared as a large ball of fire, red in color, round in shape, large, no sound, no maneuvers, and had no aerodynamic features. The object was observed for 12 minutes and had the appearance of traveling away from the observers. It disappeared below the horizon.

II. DISCUSSION

This report is similar to several other reports received by Project Blue Book during the month of March. This is one of the few reports received that has a definite conclusion by the preparing officer. The report states that the Dow AFB, Maine, intelligence office had approximately eight different unidentified objects reported to them prior to this one. Upon investigating for a cause of the sighting, it was found by the intelligence officer that the planet Venus is located in the western sky at that time of the year. Venus seems to become very large and appears to change color from red to white to orange. Due to the cloud formations, haze, etc., the planet can seem to perform various maneuvers as it nears the horizon. It will sometimes seem to drop from sight over the horizon, or go out like a light. Since the description of the object fits that of Venus and the intelligence officer's evaluation is the same, Project Blue Book is carrying the incident as "Was Venus".

III. CONCLUSION

Was astronomical (Venus).

South Carolina Area

5 March 1953

I. DESCRIPTION

At 1545 EST, the Assistant Director of Security at the Savannah River Project observed a silver crescent-shaped object visually from the ground for a period of one hour. This object was at a very high altitude, and very little information was obtained through interrogation of the observer.

A Detachment of the 727th AC&W Squadron at Congaree, South Carolina, was notified as a result of the above visual sighting. They picked up an unidentified plot on their AN/APS-5 type radar at 1707 EST that was approximately 65 miles southwest of Congaree over the Savannah River Project. The Air National Guard was notified with the result that an F-51 type aircraft was airborne within five minutes. The aircraft attempted interception until 1725 EST when the blip faded northwest of Congaree. The F-51 returned to its base.

At 1752 EST another detachment of the 727th AC&W Squadron at Camden, South Carolina picked up a blip on their AN/TPS-1b type radar. At that time an RF-80 type aircraft was scrambled to attempt interception. This unidentified blip was due west of Congaree, and to be sure he had the unidentified on his scope, the operator had the F-80 do an identification turn. This proved that he did not have the F-80 on the scope. When the object was first observed, it was approximately 100 miles west of Congaree. It then reversed its direction, and was 85 miles out heading in a northwest direction, then headed east, then west, and again to the east, fading at 115 miles and 8 degrees from Camden. For a total of 68 minutes, during both radar sightings, aircraft attempted to intercept the unidentified with negative results. At all times, the object stayed at an estimated 20,000 feet altitude, and was doing 200-220 mph.

II. DISCUSSION

A check was made to determine if there were any aircraft in the vicinity with negative results. There is a time lapse between all three sightings (ground visually at the Savannah River Project to the Congaree sighting was 22 minutes, and from the Congaree sighting to the Camden sighting was 27 minutes), causing some doubt as to whether the three sightings were connected with the same object. There was really not enough information contained in the report concerning the sighting at the Savannah River Project. For the observer to see an object for that long a period, it would have to be traveling at a very slow rate of speed and at a very high altitude for the object stayed overhead for the entire period. The radar observers were very well qualified in their fields, and their equipment was in operating condition. The radar returns were similar to those made by conventional aircraft.

This sighting was sent to the Electronics Branch of ATIC for analysis. This branch, after carefully reviewing the report, evaluated it as possibly a flying aircraft.

III. CONCLUSION

Possibly aircraft.

Luke AFB, Arizona

3 March 1953

I. DESCRIPTION

In this instance, the object was never observed, but a high altitude condensation pattern was observed. When first sighted, the contrail was approximately 300-500 feet in diameter. The pattern began with a smooth knife-like leading edge, very thin in depth and with an irregular trailing edge. As the source gave chase, the contrail made a slight dip to the NW and began climbing at 20 degrees. During this maneuver, source and object were at right angles and he observed the pattern to appear as a sharp nosed, very thin object about 300-500 feet long with an irregular, whispy trailing edge. Immediately, a heavy condensation trail began to form and extended for approximately 1000 ft. back, at which point it separated into a double trail which again was approximately 1000 ft. long, ending abruptly. At this time, the object was traveling at an estimated 400 mph true air speed. The most unusual feature was that the contrail stayed with the unsighted object, and did not extend across the sky as in the case of conventional aircraft contrails.

II. DISCUSSION

The contrail was observed by the pilots of three F-84 type aircraft with only one giving chase. This pilot chased the contrail for 50-60 miles before breaking off. A full armament and fuel load was being carried, however, source stated he was closing with the object fairly well. During the chase, this pilot took approximately 30 feet of gun camera film. This film was received in very good condition, and has been analyzed by the photographic laboratory at WADC. Their conclusions are:

a. The white streak photographed is probably a vapor trail from a rapidly moving object of unknown velocity. The object itself is invisible in the photographs.

b. The exhaust vapor trail, apparently from a twin propulsion unit, is more pronounced at the end of the film than at the start, as though the object were accelerating in response to pursuit. The configurations in the trail appear to be due to maneuvers performed by the object.

c. An additional vapor trail, thought to be due to lifting surfaces, is also in evidence, but it dissipates rapidly. This additional vapor trail appears to be centered about the exhaust trail.

d. Within the period of time represented by the film, the photographic plane may have reduced the distance between the object and itself. However, the flight paths are not parallel by a considerable angle, so that the objects distance and velocity with respect to the plane cannot be determined with useful precision.

Since there was nothing gained by photo-analysis that would actually aid in identifying the object involved, this report is being sent to the Aircraft Laboratory of WADC for further analysis. Until the report is returned from WADC, this incident will be carried by Project Blue Book as unknown.

III. CONCLUSION

Unknown.

IX. LISTING OF SIGHTINGS

The following is a list of all sightings received by Project Blue Book during this three month period giving the date, place reporting, and ATIC's evaluations. A majority of these are by no means fixed conclusions. If the reporting agency has any question regarding ATIC's method of evaluating their report or does not agree with the evaluation, their comments and suggestions are welcomed. For any additional information on an incident, contact the Commander, Air Technical Intelligence Center, ATIN: AFOIN-ATIAE--5, Wright-Patterson Air Force Base, Ohio.

SIGHTINGS FOR MAY 1953

DATE	PLACE	EVALUATION
1	Goose AFB, Labrador	Unknown
1	Goose AFB, Labrador	Insufficient Data
7	San Antonio, Texas	Probably Balloon
11	Seattle, Washington	Probably Balloon - Moby Dick
11	Tehran, Iran	Was Aircraft
12	Dayton, Ohio	Was Balloon
15	Ojibway, Wisconsin	Other -- Possibly Cloud
16	Inyokern, California	Possibly Balloon - Moby Dick
17	E. St. Louis, Illinois	Other - Unreliable Report
18	Abadan, Iran	Insufficient Data
19	Ellington AFB, Texas	Possibly Aircraft
23	Lackland AFB, Texas	Probably Aircraft
25	Ramore, Ontario, Canada	Possibly Balloon
27	San Antonio, Texas	Was Aircraft
28	Dayton, Ohio	Was Astronomical
30	Florissant, Missouri	Possibly Balloon
31	Darlington, Wisconsin	Was Astronomical - Venus

SIGHTINGS FOR APRIL 1953

DATE	PLACE	EVALUATION
3	N/W Korea	Probably Meteor
4	Webster Village, Maryland	Probably Astronomical
5	Detroit Lakes, Minnesota	Insufficient Data
8	Fukuoka, Japan	Unknown
8	Sondrestrom AFB, Greenland	Was Astronomical
8	San Juan, Puerto Rico	Probably Balloon
12	Sweetwater, Nevada	Possibly Aircraft
15	Tucson, Arizona	Unknown
16	East Prairie, Missouri	Possibly Aircraft
19	Calumet, Michigan	Other - Radar Interference
20	Brooklyn, New York	Was Astronomical - Meteor
23	Addison, New York	Possibly Aircraft
28	Klamath Falls, Oregon	Probably Astronomical
28	Fontana, California	Possibly Aircraft
29	Syracuse, New York	Probably Aircraft

SIGHTINGS FOR MARCH 1953

DATE	PLACE	EVALUATION
1	Misawa, Japan	Was Astronomical - Venus
1	Olean, New York	Probably Astronomical - Venus
1	Dover AFB, Delaware	Was Astronomical - Venus
1	Princeton, New Jersey	Was Astronomical - Venus
2	Cambria, California	Probably Astronomical - Venus
3	Luke AFB, Arizona	Unknown
4	Syracuse, New York	Insufficient Data
5	Baltimore, Maryland	Probably Astronomical
5	Erie, Pennsylvania	Probably Astronomical
5	Leeds Center, Maine	Insufficient Data
5	Congaree, S. C.	Probably Aircraft
5	Shaw AFB, Carolina	Probably Aircraft
6	Greene, Maine	Possibly Balloon
7	Tokyo, Japan	Insufficient Data
7	Hamilton, Montana	Possibly Aircraft
7	Kents Hill, Maine	Was Astronomical - Venus
8	Ashyia AFB, Japan	Insufficient Data
8	Ashyia AFB, Japan	Other - Lighted Ship
8	Warwick, Massachusetts	Was Astronomical - Venus
9	Hamilton, Montana	Insufficient Data
9	West Carrolton, Ohio	Insufficient Data
9	Miamisburg, Ohio	Insufficient Data
9	Kents Hill, Maine	Probably Astronomical - Venus
10	Great Falls, Montana	Other - Possibly Searchlight
10	Leeds Center, Maine	Was Astronomical - Venus

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Month of March (Contd)

10-11	Hackettstown, N. J.	Other - Probably Floodlights
11	Watertown, N. Y.	Was Astronomical - Venus
12	Maxwell AFB, Alabama	Insufficient Data
12	Lancaster, N. Y.	Probably Aircraft
13	Bartlesville, Okla.	Was Astronomical - Venus
13	Greenville, Mississippi	Probably Balloon
14	Anchorage, Alaska	Probably Astronomical - Venus
15	Erding AFB, Germany	Probably Astronomical
15	Le Moye, Alabama	Other - Conflicting Report
17	Great Falls, Montana	Possibly Astronomical - Venus
18	Williams AFB, Arizona	Other - Paper in Air
19	Crystal Lake, Ohio	Possibly Aircraft
19	Harmon AFB, Newfoundland	Was Balloon
19	Tonawanda, N. Y.	Insufficient Data
19	Cape Vincent, N. Y.	Was Astronomical - Venus
20	Lake Superior Region	Insufficient Data
21	Elmira, New York	Other - Possibly Paper in Air
23	Bay City, Michigan	Possibly Astronomical
23	Pasadena, Texas	Other - Conflicting Report
23	Casper, Wyoming	Was Balloon
24	Kent, England	Insufficient Data
25	Rabat, French Morocco	Was Aircraft
25	Panama City, Florida	Probably Aircraft
25	San Antonio, Texas	Unknown
27	Canal Zone, Panama	Probably Astronomical
27	Harmon AFB, Newfoundland	Insufficient Data

Month of March (Contd)

27	Mt. Taylor, New Mexico	Possibly Balloon
28	Scott AFB, Illinois	Possibly Balloon
29	Cochransville, Penn.	Insufficient Data
29	Spooner, Wisconsin	Insufficient Data
30	Lyle, Washington	Probably Balloon
31	Conrad, Montana	Was Astronomical - Venus
31	Williams AFB, Arizona	Possibly Balloon
31	Honshu, Japan	Unknown

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SECRET
AUTH: CGADR ATIC
BY: H. C. JOHNSTON
Lt Col, USAF
DATE: 30 Sep 53

This report is the twelfth of a series of tri-monthly status reports on Project Blue Book covering the months of June, July and August 1953.

Any additional information may be obtained on any incident by directing requests to the Commander, Air Technical Intelligence Center, ATTN: AFOIN-ATIAE-5, Wright-Patterson Air Force Base, Ohio.

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STATUS OF PROJECT BLUE BOOK

I. OVERALL STATUS

A total of 91 reports of unidentified flying objects were received by Project Blue Book during the period covered by this status report (June, July, August 1953). This is an increase of 2 reports over those received during the period covered by Status Report No. 11 (March, April, May 1953). An average of 6.9 reports per week has been received by the Air Technical Intelligence Center for the past six months.

Because of the decrease in newspaper publicity, fewer reports have been received from civilians with the result that military sightings now account for approximately 60 per cent of unidentified flying object (UFOB) reports. In spite of the dropping of the subject by the national press, it is significant to note that a steady influx of 6.9 reports per week are received by Project Blue Book from persons who sincerely believe they observed unusual airborne objects. This is one of the reasons why this project is being continued.

Every effort to improve the quality of reports has been made by Project Blue Book. Briefings to the Air Defense Command were conducted stressing the need for more complete and scientific data in order to properly evaluate the observations. A manual has been prepared recently for the purpose of instructing reporting officers on what information is desired on an unidentified flying object observation. Reporting officers have been requested to hold preliminary investigations before forwarding the report to this Center. Air Force Regulation 200-2 sets up new reporting procedures on unidentified flying objects so that reports will be more complete. The quality of the reports has increased considerably and the result has been that approximately 90 per cent of the observations are being explained. This leaves 10 per cent unexplained as compared with 20 per cent unexplained in 1952.

A complete statistical study of all reports from 1947 to 1952 is expected not later than 15 October 1953. This study will include statistical probabilities on indexes of comparisons on unidentified flying objects and a general commentary of the conclusions reached by the study. This is the first effort ever made to treat sightings mathematically.

The Air Technical Intelligence Center has set up a policy to keep the American public informed on the operations of this project. All releases of public information are handled by the Office of Public Information, Department of Defense, Washington 25, D. C.

Project Blue Book continued to screen and evaluate all reports as soon as possible after being received. The following represents a breakdown of the number of reports by month and the percentage breakdown of evaluations.

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STATUS REPORT

PROJECT BLUE BOOK - REPORT NO. 12

FORMERLY PROJECT GRUDGE

PROJECT NO. 10073

30 SEPTEMBER 1953

AIR TECHNICAL INTELLIGENCE CENTER
WRIGHT-PATTERSON AIR FORCE BASE
OHIO

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Commander, Air Technical Intelligence Center
Wright-Patterson Air Force Base, Ohio

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	CONCLUSION	NO.	PERCENTAGE
	Astronomical	7	25.9
June:-	Balloon	4	15.1
	Aircraft	3	11.1
Sources	Insufficient Data	5	18.4
Mil 62.5	Other	5	18.4
Civ 37.5	Unsolved	3	11.1
	Total	27	100.0
	Astronomical	9	24.4
July:-	Balloon	13	35.1
	Aircraft	5	13.5
Sources	Insufficient Data	4	10.8
Mil 50	Other	3	8.1
Civ 50	Unsolved	3	8.1
	Total	37	100.0
	Astronomical	5	18.5
August:-	Balloon	6	22.3
	Aircraft	4	14.8
Sources	Insufficient Data	7	25.9
Mil 46.1	Other	2	7.4
Civ 53.9	Unsolved	3	11.1
	Total	27	100.0

II. CANADIAN "FLYING SAUCER"

Project Blue Book has received several reports from the Air Attache in Ottawa, Ontario, Canada, substantiating the fact that experiments on a "flying saucer" are actually being conducted at A. V. Roe, Limited, Toronto, Canada.

Mr. Jack Frost, the designer-engineer, has been working on this particular project for the past three years at A. V. Roe, Toronto, Canada. During this period he has made several attempts to gain the interest of various agencies in his project, but without apparent success; he visited the United Kingdom and was unable to arouse any interest in his project. Approximately two or three years ago, he also visited Wright-Patterson AF Base, Ohio (supposedly on other business), and outlined his ideas to as yet anonymous personnel. Recently, and presumably as a result of Viscount Montgomery's briefing on this project, Mr. Frost was again sent to the British Isles by A. V. Roe, Limited, supposedly to wind tunnel test his model, but in fact to present his ideas and design to prominent British authorities.

Mr. Frost is presumed to be in the United Kingdom at the present time. A recent letter received by the Defense Board of Canada from their liaison officer in the United Kingdom indicated that Mr. Frost received a cordial reception from British scientific personnel and has convinced several of his major critics that his ideas are sound. It has also been reported from another source that the United Kingdom (firm or individual

unknown) has been working on a similar design, but that Mr. Frost is much further along and the United Kingdom is considering his proposal with a view toward adopting his proposals at the expense of their own.

The Defense Research Board of Canada and the Royal Canadian Air Force have been aware of Mr. Frost's work for sometime. Several months ago they took an interest in the project and a proposal was made to the Minister of Defense recommending that a developmental contract be let to A.V. Roe, Limited, to develop this concept. The Minister, at Cabinet hearings, recommended approval which was rejected because of the fact that the CF-100 program had been such an expensive venture that it was not practical to consider contracting for any new design at the time.

It was stated that the Defense Research Board and the RCAF have been unable to push this project regardless of the personal enthusiasm of the members of both organizations.

In the light of Mr. Frost's reception in England, it can be anticipated that the entire project will be reconsidered at the highest government levels.

It must be remembered that this project at the present time is entirely supported by A. V. Roe, Limited, and that the company has patented certain design features. It must also be remembered that Mr. Frost was the project engineer of the CF-100, an all-weather intercepter. A key member of the Defense Research Board has indicated that he believes the project will receive favorable reconsideration. If approval is obtained and a definite Department of Defense project is established, the U.S. Air Attache in Ottawa has been assured that USAF authorities will be given every opportunity to cooperate in the furtherance of this development. Until this approval is granted, the Department of Defense has no official position in relation to the entire project.

It has been determined that Mr. Frost has not actually flown a small model. He has arranged a model on a test stand and has used compressed air as a motive power rather than a combustion engine. Mr. Frost claimed that he had flown the model from Malten Airfield and it is actually a "flying saucer" type.

On two known occasions, Mr. Frost briefed RCAF and United Kingdom officers on his project. On 13 May 1953 RCAF officers went down to the A. V. Roe aircraft factory for the purpose of viewing a "flying saucer" demonstration by Mr. Jack Frost. Mr. Frost was delighted by their interest and went into great detail in explaining his pet project. Following this interview, the officers returned to Ottawa with glowing account of Mr. Frost's remarkable "flying saucer". On the other occasion, a United Kingdom Army officer visited the factory and received a comprehensive briefing by Mr. Frost. The officer was reportedly enthusiastically impressed and appeared to understand fully the air-flow concepts involved. He claimed that it was the greatest thing he had ever seen.

Mr. Frost is reportedly a very serious, unpretentious man who wants only to build his "saucer". If the British or the Canadians refuse to back him, it is believed that he would go somewhere else. He has read many stories of "flying saucers" and they all seem to fit in with his own concepts, such as the housing, extreme speeds, etc. He claims it is basically simple and is amazed that it hasn't been produced before. For this reason he claims emphatically that he is not the first to build a "saucer"; he feels confident that the Russians have a similar model and have been operating it from submarines. He has checked with medical authorities who have confirmed his positioning of the pilot as in a seated position, legs slightly apart, upper-trunk of body leaning forward for vertical vision, up and down.

Mr. Frost is extremely confident that his radical design will work and will attain fantastic speeds. His first prototype he claims will be 24 feet across, travel at speeds up to 3000 MPH, be capable of being operated from a submarine or other small space, be housed in an ordinary garage, and have tremendous payload capacity. He claims that it will have a range of 1000 miles at extreme speeds and be able to hover over one spot and then dart off again in any desired direction. Frost claims that he can produce four "saucers" for the price of one F-86.

Project Blue Book is continuing an active interest in this matter and making every effort to obtain the latest true facts on the "saucer". More pertinent information is expected from the U.S. Air Attache in London, England.

III. AIR FORCE REGULATION 200-2

Air Force Regulation 200-2 dated 26 August 1953 supersedes Air Force Letter 200-5 dated 29 April 1952. This regulation requires more complete information which will simplify the evaluation of unidentified flying object (UFOB) reports. Instead of a TWX being followed by a written report within 72 hours, as was prescribed in AFL 200-5, AFR 200-2 requires that only a detailed TWX be forwarded to ATIC except when requested. By setting up more appropriate methods, it is believed that this new directive will aid Project Blue Book in the analysis of unidentified flying object reports.

IV. CONTRACTOR STATUS

A representative from the civilian research organization, Project Stork, which is preparing the IBM study on reports of unidentified flying objects from 1947 to 1952 visited Project Blue Book on 20 August 1953 for the purpose of explaining the status of the study. These reports do not include the many letters that were received directly from the public, but they do include all sightings reported through military channels and questionnaires filled out by observers and forwarded directly to the Air Technical Intelligence Center. The representative stated that the statistics on all these sightings would be completed not later

than 1 September 1953. It was agreed that all unsolved reports should be reviewed by Project Stork before the final study is completed. The final study is expected not later than 15 October 1953. It is believed that this study will be extremely significant in future evaluations and operations of Project Blue Book.

Project Stork is also securing new diffraction gratings for the Videon camera which is currently out in the field. The suitable gratings are expected the latter part of October 1953.

V. VIDEON CAMERA STATUS

The distribution of 73 Videon cameras without suitable diffraction gratings was completed 1 June 1953. This distribution was made to selected AACS towers and ADC radar sites throughout the United States. Although the cameras could not be used in obtaining a light spectrum, it was agreed that cameras be sent for the purposes of familiarization and physical evidence of unidentified flying objects. A few of the camera sites have utilized the cameras in photographing unidentified objects, but in each case the image was too small to properly analyze. Project Blue Book has encouraged all the above mentioned sites to utilize this camera under varied light conditions so that personnel operating the cameras will have a sufficient knowledge of its operations to properly photograph an unidentified flying object under any light condition.

When the suitable gratings are received, the cameras will be recalled, the gratings mounted and redistributed to the sites. This operation is expected to take place in November 1953.

VI. FLYOBRPT MANUAL

The Flyobrpt Manual is intended for use by intelligence officers, operations officers, or anyone who may at some future date be required to submit a report of an unidentified flying object. This manual serves as a guide to reporting officers on the investigations, reporting procedures, and operations of Project Blue Book.

Although the quality of reports has continued to improve during the past year, in many cases the data that is forwarded has been too nebulous to be of much value for analysis. It is realized that in many cases only a limited amount of specific data can be obtained from the source. One of the most important goals of this project is that every possible effort be made to collect supporting information on an observation.

It is believed that this manual will aid in pointing out what information is wanted and make the collection of information as easy and fast as possible. The entire manual has been slanted toward obtaining the greatest amount of data without increasing the workload of the reporting officer.

This manual is being forwarded to Air Force installation commanders throughout the Zone of Interior.

VII. SYNOPSIS OF REPORTS

An individual summary of twelve characteristic unidentified flying object reports for June, July, and August follows.

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30 June 1953 UNCLASSIFIED Ramore, Ontario, Canada

Description

At approximately 2345 EDST on 30 June 1953 an unidentified flying object was observed for a period of twenty minutes in the northern sky moving to the southeast by at least 10 personnel of the 912th AC&W Squadron, Ramore, Ontario, Canada. The first person to observe this object was an airman who came out of the maintenance room to inspect the power unit which caused a minor breakdown of the search radar set. He called two other airmen to witness the object. One of the two thought the object was the moon. The airman who originally observed the object got hysterical and called the Charge of Quarters at the Domestic Area three miles to the southwest. At least seven witnesses at the Domestic Area saw the object and two of them reported that the moon was visible at the time and that the object was distinct and separate from the moon. The object was described as orange colored and oval shaped. It was described as moving from the north to southeast and then fading back to the north. No great speed was attributed to the object by any of the witnesses who said they saw movement. It was reported that the object had no visible means of propulsion and that there was no similarity to any known flying object.

Discussion

The sighting was made a few minutes after the scheduled time for the moon rise. The shape of the moon that night was similar to the description of the object, however, any explanation as that of the moon is in conflict with the reported observation of the two witnesses seeing both the moon and the object at the sametime. There was a heavy broken overcast at the time of the sighting. There is a probability that the object was the moon reflecting off the clouds.

Conclusion

Possibly astronomical.

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24 June 1953

New London, Connecticut

Description

On 24 June 1953 one unidentified flying object was sighted by two Eastern Airlines' flights and one American Airlines' flight approximately 10-20 miles south-southeast of New London, Connecticut. This object appeared to burst into flames as it broke into two pieces, soon afterwards extinguishing itself and dropping into the ocean.

Discussion

This incident was solved very easily. Supplementary information received by Project Blue Book on 26 June 1953 stated "Objects sighted by pilots at approximately 2130E 24 June 1953. Two jet aircraft out of Quonset Point NAS had a mid-air collision at 2130E 24 June 1953. Aircraft fell in flames 15 miles west of Quonset Point." After interrogation of pilots, it was concluded that the flights did observe the above collision.

Conclusion

Was aircraft.

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16 June 1953 UNCLASSIFIED San Antonio, Texas

Description

Several airmen in the control tower at Kelly AF Base observed on unidentified flying object at 1945 CST 16 June 1953 for approximately 5 minutes. This object was elliptical shaped and appeared to be equal to the size of a $4\frac{1}{4}$ by $9\frac{1}{2}$ inch envelope held at arm's length. No aerodynamic features, trail, exhaust, or propulsion system were noted. Object disappeared quickly in much the same manner as would a light being extinguished. Observers stated that object was quite similar to a cloud or smoke through which a light was shining.

Discussion

A check with airfields in the vicinity determined that there were no aircraft in the area at the time of sighting. The local AC&W squadron was contacted with no results. The observer's statement -- "Due to the physical makeup of the object, this sighting could be explained as the reflection of the sun on a high cirrus cloud.

Conclusion

Other - Probably light reflection on cloud.

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10 June 1953

Detroit, Michigan

Description

At 2310 EST on 10 June 1953 an AFROTC cadet at Wayne University observed one large bright object that was white or light yellow in color, round in shape and larger than a star. This object moved from a high westerly position in a falling arc toward the north and then leveled off and proceeded at a high rate of speed to the north in a straight line. This object made these maneuvers in a period of 60 seconds and disappeared over the northern horizon. The object, though bright, cast no beam nor left any trail or exhaust. No sound was noticed.

Discussion

Movements of this object and length of observation eliminate the possibility that it was of astronomical origin. Checks with airports in the vicinity revealed that there was one aircraft in the area. This was a DC-4 enroute to Chicago on a heading of 270 deg and was probably not in the area. A check was made with the weather bureau to determine whether or not they had a balloon in the area. A balloon was released at 0300Z, but it could not have caused the sighting since it burst before 0410Z (time of sighting).

Conclusion

Unsolved

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9 June 1953 UNCLASSIFIED Tillamook, Oregon

Description

One unidentified object was reported by two USAF officers stationed with the Moby Dick balloon launching detachment, Tillamook, Oregon. This object was seen at 1010 PST 9 June 1953. The object was viewed through a theodolite and appeared half-moon in shape and white in color. It appeared to hover and no manner of propulsion was observed. No manner of disappearance was reported.

Discussion

During such a long period of observation, any conventional object known to be on this earth would, under existing conditions, have moved more than this particular object did. The winds at 30,000 feet were from 120 deg at 25 knots. Project Blue Book's astronomer was contacted and they stated that this sighting was undoubtedly the planet Venus which, under ideal conditions, can be seen during the daylight hours.

Conclusion

Was astronomical (Venus).

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2 June 1953 Newton, Mississippi

Description

On the night of 2 June 1953 at approximately 2251 hours a Convair T-29 type aircraft No. 1931 was on a round-robin flight from Ellington AF Base to Tuscaloosa, Alabama. The aircraft was on a course approximately 58 degrees magnetic moving in a northeast direction at an altitude of 9000 feet. The aircraft was 7½ miles south-southeast of Newton, Mississippi, when a whitish-green light attracted the pilot's attention. The light had the appearance of an aircraft navigational light and was estimated to be from 5 to 7 miles from the aircraft. The object was visible an estimated 12 to 15 seconds. The pilot thought the light was an aircraft's navigational light and that it seemed to be on a parallel course with the aircraft. The light seemed to brighten and the pilot, thinking it was an aircraft turning into him, started to change course to avoid collision. At the time the object appeared to climb, as at the beginning of a chandell, and at the sametime the light was intensifying in a greenish-white color and leaving a trail of fire and sparks similar to a 4th-of-July rocket in flight. After approximately 2 seconds of this climb, the object disintegrated into a ball of fire.

Discussion

The ATIC contract astronomer states that the object observed was a meteor. The fact that the object appeared to climb was probably caused by the motion of the aircraft as it turned to avoid collision.

Conclusion

Was astronomical (meteor).

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26 July 1953 Nellis AF Base, Nevada

Description

Two civilians who work in the Aero Maintenance Section at Nellis AF Base were on a picnic at Deer Creek Springs, Nevada, when they saw an unidentified flying object that was estimated to be 100 feet in diameter and at an altitude of 70,000 feet. The object was silvery metallic in color and reflected the rays of the sun brilliantly at times. The object was observed for a period of one hour with both ten power and seven power binoculars.

Discussion

Reporting officer stated in his report that there were no weather balloons or aircraft in the area at the time of the sighting. A check was made with the upper air research balloon tracks received from Lowry AF Base revealing that there was very probably a balloon over that area at the time of this sighting.

Conclusion

Probably balloon (upper air research).

24 July 1953 UNCLASSIFIED Key West, Florida

Description

Between the hours of 2200 and 2230 EST, a student at the Fleet Sonar School, United States Naval Base, Key West, Florida, observed an unidentified flying object in the sky over the town of Key West. The object appeared to be approximately the size of a pin point or a star, very bright white in color, proceeded rapidly from low on the western skyline to a point directly forward and overhead. The object then blinked out momentarily before descending below the eastern skyline. No aerodynamic features, trail, exhaust, propulsion system, or sound were noted. Speed was reported as unknown, since the observer did not know the object's true size or its distance from him. The observer stated that the object appeared to move in regular smooth circles.

Discussion

Inquiry was made as to the observer's general reputation and character. His supervisor in Sonar Operations stated that he had no knowledge of the observer except during duty hours. The supervisor gave him a character rating of "very good", "above reproach", and described him as a quiet, conscientious, good student - not outstanding but above average. The interviewer stated that the observer appeared to be stable, well-adjusted, and very consistent with his answers after considerable questioning.

The weather at the time of the observation was reported as a broken overcast. Clouds were reported to be solid to the west where the object disappeared. A check with CAA office of U.S. Weather Bureau at Boca Chica Key revealed a ceiling of 22,300 feet.

There were several aircraft in the area and one of them was equipped with a searchlight. There is a probability that the observer saw the searchlight scanning the area.

Conclusion

Other - Probably searchlight on aircraft.

7 July 1953 Atlanta, Georgia

Description

On the night of 7 July 1953, three observers from Atlanta were driving on Highway 78 near Mapleton, Georgia, when they encountered a "flying saucer" in the middle of the road. There were three small animals near this red colored "saucer". As the observers bore down on this object, two of the animals entered the "saucer" and escaped. As the "saucer" rose and disappeared at a 45 degree angle, it turned a light blue in color. Observers' car struck the third animal and knocked him unconscious. After getting out of the car and finding this animal which was approximately 21 inches in length, had long ears, no hair, and no tail, observers stayed at the scene and several other automobiles stopped. The animal died in about 30 minutes and was taken to one of the Atlanta newspapers. A reporter for the newspaper called the FBI, who in turn called the OSI to investigate the incident.

Discussion

This animal was first examined by a local veterinarian who stated that he had never seen such an animal before. Later the animal was taken to Emory University where an Emory authority identified it as a member of the monkey family and not an "animal from space". A member of the State Crime Labratory and another member of the Emory University staff identified the animal as a monkey which had been shaved and from which the tail had been removed. Observers confirmed that the whole story was a hoax resulting from a $10.00 bet with a friend that he (observer) could not get his picture in the paper. Observer was fined $40.00 for obstructing the highway and was released at that time.

Conclusion

Other - Hoax.

Note: This is one of many similar reports received by Project Blue Book.

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3 July 1953 Reno, Nevada

Description

At 1145 A.M. MST 3 June 1953 two civilians were sitting on a lawn at East 9th and Lake Streets, Reno, Nevada. One observer was looking up through some tree branches when she saw a pin-point of light at a very high altitude. She called her husband's attention to the object and he watched this object for 8 minutes, thinking it was a weather balloon. He thought that it was not likely to be a star, because the day was bright (hot) and cloudless. However, it neither moved nor changed its apparent size. The observer left his wife to watch the object while he reported it to the authorities. First he reported it to a policeman who referred him to the Police Station. They were not interested and told him to report it to the sheriff's office. The sheriff's office stated that this sighting was out of their jurisdiction and for him to call the FBI. The FBI took his name and address. The observer told the FBI that he couldn't locate the object unless he had this particular tree as a reference point. He then returned to the point of observation where his wife still had the object in view. After 20 minutes, being somewhat surprised that no one had appeared to verify the sighting and considering the possibility that a mistake had been made as to the reported location of the sighting, he again telephoned the FBI. He was told that the matter had been referred to Stead AF Base. The observer becoming aware that it was going to be difficult to get any official verification while the object was still in view obtained the name of the USAF colonel to which the report had been made. After some difficulty, the observer reached this colonel by telephone. This colonel referred the incident to another colonel who in turn referred him to a third colonel. From the last colonel that he talked to, he got the impression that someone would come to verify the sighting and returned to the scene where the object was still visible. While not appearing to move, it had shifted position slightly because it was necessary for him to move occasionally to prevent its being obscured by the tree branches. After waiting 30 minutes, the observer again called the Air Force colonel to ask him if he couldn't send someone to verify the sighting. The colonel requested that the observer stand by the telephone and he would call him back. This the colonel did 15 minutes later, requesting that the observer obtain a disinterested person to verify the sighting. Observer returned to site of observation and the object was still visible. He stopped a car and requested the driver to observe the object. The driver of the car was a professor at the University of Nevada and a very good observer. Observer again called the Air Force colonel and reported the verification. The colonel then stated that he would send 2 enlisted men to the observers' motel for a debriefing. Two sergeants visited the observers at their motel expressing appreciation for the observers' efforts and stating that the Air Force was very interested in such reports. Observer pointed out to the sergeants that the Air Force had been aware of the sighting for over an hour during which time the object could be seen but hadn't been interested enough to look at it.

3 July 1953 - Reno, Nevada (contd)

Discussion

This sighting is one of the best in Project Blue Book's files as far as civilian observers are concerned. These civilians were very diligent in their efforts to report the sighting and it is unfortunate that the officials in that area were not aware of the procedure for reporting unidentified flying objects. The description of this object, and the length of time observed rules out any conventional objects in our atmosphere. Project Blue Book's contract astronomers were contacted. They stated that this sighting was undoubtedly caused by the planet Venus.

Conclusion

Was astronomical (Venus).

~~SECRET~~

UNCLASSIFIED

17 August 1953

Peoria, Illinois

Description

Two civilian observers at different locations in Peoria saw an unidentified flying object at 1445 CST 17 August 1953. The object appeared the size of a baseball with a very brilliant white color. No trail or exhaust was observed and the object seemed to be suspended in the air and then slowly moved away. The speed of the object was unknown. The object was observed south of Peoria and moved off south-southeast. At the time of this sighting, personnel of the 791st AC&W Squadron, Hanna City, Illinois, observed a half-moon shaped object in the same vicinity. Total time of observation was 30 minutes.

Discussion

The AC&W Squadron at Hanna City did not pick up any unusual tracks on radar in the area mentioned. Checks with local weather station for possible release determined that there were no weather balloons in the area. Checks made with airfields in the vicinity precluded that there were no aircraft in the area. Check with upper air balloon tracks reveal that there was an upper air research balloon over Peoria at the time of sighting.

Conclusion

Was balloon.

Description

Since this sighting was a combined air-visual, ground-visual, air-radar, and ground-radar report, it was decided that Project Blue Book would send an investigator to the scene. The controller on duty at the time of the incident was interviewed. His account of the incident was almost identical to that given in the initial TWX. He was on duty at 2005 MST when a GOC post observer called in an unidentified flying object sighted northeast of her post at Blackhawk, South Dakota. (Note: Sunset 1920 MST - Twilight 33 minutes.) She reported through the Rapid City Filter Center. She reported that the object was stationary, then moved south toward Rapid City. When the controller got the report that the object or light was headed toward Rapid City, he sent 3 airmen from the radar site to look for it visually. They reported a light moving from generally north to south at a high rate of speed. At this time the controller observed 2 blips going south on the scope. He could not get a distinct track because of ground clutter in the area. In a few minutes the GOC post in Blackhawk called in that the light was back in nearly its original position. An airborne F-84 was vectored into the area and after a search made visual contact. The F-84 was vectored into the blip that was remaining stationary at about 15 miles northeast of Blackhawk. The controller said that he believed the F-84 pilot saw the target that was on the scope. Shortly after the visual sighting by the pilot, the target started to move on a heading of about 320 degrees magnetic. Four good blips were obtained. Photos of this track were taken but the camera malfunctioned and the photos were no good. The last blip occurred at 70 miles and at that point the aircraft was returned to the base. The GOC observer reported seeing the aircraft and the object, and both were moving. The object seemed to be out-distancing the F-84. As soon as the F-84 landed, another F-84 took off for CAP. Just about that time, the Blackhawk GOC post called the third time stating that the object was back again. Nothing was on the scope (there was possibly a target in the ground clutter), so the F-84 was vectored in on the visual report. The pilot soon got a visual and started an intercept. About that time, the controller picked up both an unknown target and the F-84. Both were on a heading of about 360 degrees magnetic. The blip seemed to stay about 5-10 miles ahead of the F-84. The chase continued until the aircraft was about 80 miles out, then the intercept was broken off. The target continued off the scope. At this time the Bismarck Filter Center was alerted to look for unidentified flying objects. When the pilot got back over the base, he saw another light. This was not picked up on the scope, but the controller did get a return on the height finder equipment in the general direction of the light, it was 8000 feet. At 0023 MST, Bismarck began to call in reports.

The pilot who was on the first CAP was interviewed next. He stated that he had been making passes at a B-36 north of Rapid City when GCI called and said they had a target west of Rapid City. He searched for

about 20 minutes west and south of Rapid City but saw nothing. He returned to base and was about to land when he observed a light northwest of the base. He started out on a heading of 350 degrees magnetic, the object was high (30 deg - 45 deg) at 11 o'clock from him. He checked the possibility of a reflection and determined that this was not the cause. He continued his course keeping the object at 11 o'clock for a better view. After about 30 seconds, it disappeared then reappeared for another 30 seconds at the end of which it abruptly faded and was not seen again. The object was silver in color and varied in intensity. It appeared to "pull away" because it got smaller. The comment as to size was that it was "brighter than the brightest star I've ever seen".

The pilot who flew the second CAP was interviewed next. He stated that he took off and started to climb when GCI told him that GOC had a light. He was north of Ellsworth AFB on a heading of 360 degrees magnetic when he saw a light 30-40 degrees to his right and level. He thought it was a star or planet but as he looked away it appeared to "jump" 15-20 degrees in elevation. (Note: Due to the speed of the aircraft and the fact that the pilot was intent on identifying the object, he was not exactly sure of his positions. All positions are subject to some error.) The light seemed to be parallelling his course. The first thing the pilot did was to check for reflections in the cockpit (i.e., canopy, gunsight head, etc.). He was sure the light was no reflection in the aircraft. The light, which the pilot estimated to be considerably brighter than a star, changed intensity and changed in color from white to green. When the object was first sighted, the aircraft was at 15,000 feet. The pilot started to climb and the light appeared to climb faster. This was because the angle of elevation increased. He climbed to 26,000 feet. All this time both the radar blip of both the object and the aircraft were being carried and the pilot was talking to the controller on UHF. As the pilot turned into the light on his initial sighting, he turned on his radar gunsight. As he swung onto the target, the warning light came on. No range was obtained since the sight starts to measure at about 4,000 yards. All this might indicate was that something was beyond 4,000 yards. The light remained on until the chase was broken off. After the chase, on the way home, the light blinked on and off several times indicating a possible malfunction. The sight was not checked by maintenance on return and had not been checked since.

The F-84 chased the light for about five minutes, or to about 80 miles north of the base. The light appeared to make slow changes in color and intensity. The pilot stated that the light definitely moved in relation to the stars. After the intercept was broken off, the aircraft returned toward base.

About 20 miles out of base he got a visual on a similar light that changed from red to white. He was on a heading of 180 degrees magnetic at 12-14,000 feet and the light was 10 degrees low to the right. He thought it was a car going around curves in the hills but changed his mind when the red and white lights were of equal intensity. This target was in the ground clutter of the radar but something at 8000 feet was picked up on the height finder radar. The light slowly went out then

came back in. It seemed to be west moving since the aircraft was kept on a constant heading and the angle of azimuth and elevation increased. The light was first observed for 30 seconds, it faded, reappeared, then faded again after 30 seconds.

As the pilot came around the west side of the air base and up the east side, he saw another light and turned into it to take gun camera photos. (The photos were no good).

Discussion

A visit was made to the Weather Bureau station at the Rapid City Municipal Airport to check weather and balloon launches (Note: The air base launches no balloons). The observer on duty looked up the balloon track for the balloon launched at 2000 MST on 5 August 1953 and it went south from the Municipal Airport. This puts it out of the area of the sighting. Data on inversions was not available as it had been forwarded to Asheville, North Carolina. (Note: The balloon tracks and weather for 2000 MST on 5 August has been requested from Asheville.)

No attempt was made to contact the GOC observers at Blackhawk. They had been interrogated by base personnel and were "all excited". It was believed that an investigator talking to them would only further excite them needlessly. All the sightings at Bismarck are doubtful. The AC&W Station called the Bismarck Filter Center and told them to "look for flying saucers", a perfect set up to see every star move around.

The upper air research balloon tracks at Lowry were checked. Two balloons were lost and could have been in the area at the time of the sighting.

A few comments on the sources can be made:

Controller left the impression that he was trying to prove the existence of an unidentified flying object. It is very unfortunate that no scope photos were available to collaborate his story. He saw targets on the scope, there is no doubt about it, but whether they acted exactly as he stated is unknown.

The two airmen that went outside to observe the object that was being carried on radar and reported by the GOC were not sure of what they saw, at least this is the impression they left. They were told to go out and look for a light so they saw one. Their description fits that of a meteor. They only saw a "streak" in the sky. They did not see it return north, only go south.

The first pilot only got a glimpse of a light so he could not add much.

The second pilot gave the impression of being "on the ball". He obviously was trying to convince himself the light was a star, but was

having difficulty. He took a realistic approach and had done some logical reasoning. He was worried about the fact that the light moved relative to the stars.

By eliminating doubtful sightings, the only thing that can be reasonably assured is that a GOC post observed a light. This could be a balloon or star. Radar picked up something in the general area of the GOC post and vectored an aircraft toward it. The pilot saw a light and chased it. He got a radar lock on it, but this could have been a malfunction. The star Capella is possibly visible low on the horizon to the north and the pilot could have seen this. Pending further study, this incident is carried as Unsolved.

Conclusion

Unsolved.

SIGHTINGS FOR JUNE 1953

DATE	LOCATION	EVALUATION
30	Ramore, Ontario, Canada	Probably Astronomical
30	Mather AF Base, California	Insufficient Data
24	Washington, D. C.	Insufficient Data
24	Annapolis, Maryland	Balloon
24	Iwo Jima	Unsolved
24	New London, Connecticut	Aircraft
24	Cincinnati, Ohio	Probably Astronomical - Meteor
24	Simiutak, Greenland	Unsolved
23	Del Rio, Texas	Possibly Astronomical - Meteor
22	Goose AF Base, Labrador	Insufficient Data
21	Pepperrell AFB, Newfoundland	Possibly Astronomical
21	Okinawa	Probably Aircraft
20	Shawnee, Kansas	Insufficient Data
18	Key West, Florida	Other - Searchlight on aircraft
17	Iwo Jima	Other - Possibly weather effects on radar
16	San Antonio, Texas	Other - Light reflections on clouds
12	Covington, Georgia	Possibly Balloon
10	Goose AF Base, Labrador	Other - Weather Phenomena
10	Detroit, Michigan	Possibly Aircraft
9	North Korea	Probably Balloon
9	Tillamook, Oregon	Astronomical - Venus
8	Bethesda, Maryland	Possibly Balloon
7	Norwood, Ohio	Insufficient Data
4	Gainesville, Texas	Unsolved

Sightings for the month of June 1953 continued.

DATE	LOCATION	EVALUATION
2	San Antonio, Texas	Other - Possibly light reflection
2	Lake Charles, Louisiana	Probably Astronomical - Meteor
2	Newton, Mississippi	Probably Astronomical - Meteor

SIGHTINGS FOR JULY 1953

DATE	LOCATION	EVALUATION
31	Creola, Alabama	Probably Astronomical - Meteor
29	Springfield, Ohio	Probably Balloon
26	Dayton, Ohio	Balloon
26	Nellis AF Base, Nevada	Probably Balloon - UAR
26	Tinker AF Base, Oklahoma	Weather Balloon
25	Washington, D. C.	Probably Astronomical
25	Dayton, Ohio	Insufficient Data
25	Perrin AF Base, Texas	Possibly Balloon
25	Central House, Alaska	Balloon
24	Key West, Florida	Other - Probably searchlight on aircraft
22	Atlantic City, New Jersey	Insufficient Data
20	Offutt AF Base, Nebraska	Unsolved
19	La Grande, Oregon	Balloon - UAR
18	Key West, Florida	Insufficient Data
18	Sheridan, Wyoming	Probably Astronomical - Meteor
18	Brooklyn, New York	Probably Aircraft
14	Fairborn, Ohio	Probably Balloon
14	Opportunity, Montana	Insufficient Data
13	Shaw AF Base, South Carolina	Possibly Astronomical - Meteor
12	Adrian, Michigan	Possibly Balloon
11	Godman AF Base, Kentucky	Astronomical
10	Forrest City, Arkansas	Possibly Balloon
9	Ft. Worth, Texas	Possibly Aircraft
9	Sheppard AF Base, Texas	Possibly Aircraft
8	Colville, Washington	Probably Astronomical

Sightings for the month of July 1953 continued

DATE	LOCATION	EVALUATION
8	Tinker AF Base, Oklahoma	Probably Balloon
7	Atlanta, Georgia	Other - Hoax
6	Stillwater, Oklahoma	Other - Searchlight reflections
4	Tinker AF Base, Oklahoma	Balloon
3	Middletown, New York	Possibly Aircraft
3	Tipp City, Ohio	Unsolved
3	Reno, Nevada	Astronomical - Venus
3	Fremont, Wisconsin	Possibly Aircraft
2	Tinker AF Base, Oklahoma	Unsolved
2	Shaw AF Base, South Carolina	Probably Astronomical
1	La Grande, Oregon	Possibly Balloon
1	Ramore, Ontario, Canada	Probably Astronomical

SIGHTINGS FOR AUGUST 1953

DATE	LOCATION	EVALUATION
28	Turner AF Base, Georgia	Possibly Balloon
28	Jamestown, North Dakota	Insufficient Data
28	San Rafael, California	Probably Astronomical
27	Falls Church, Virginia	Insufficient Data
27	Greenville, Mississippi	Insufficient Data
26	Bermuda	Insufficient Data
23	Port Moresby, New Guinea	Insufficient Data
22	San Antonio, Texas	Possibly Aircraft
20	California Area	Insufficient Data
17	Creola, Alabama	Probably Astronomical - Meteor
17	South Central France	Possibly Balloon
17	Wethersfield, England	Probably Balloon
17	Peoria, Illinois	Possibly Astronomical
16	Ramore, Ontario, Canada	Unsolved
15	Madison, Wisconsin	Possibly Balloon
12	Ventura, California	Probably Aircraft
12	Leesburg, Virginia	Probably Aircraft
11	Barksdale AF Base, Louisiana	Probably Astronomical - Meteor
10	Wilmington, North Carolina	Other - Unreliable Source
9	Moscow, Idaho	Other - Probably light reflections on clouds
7	Martha's Vineyard, Mass.	Possibly Astronomical
5	San Antonio, Texas	Possibly Balloon
5	Rapid City, South Dakota	Unsolved
4	Onida, South Dakota	Insufficient Data
4	West Point, Nebraska	Possibly Aircraft

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Sightings for the month of August 1953 continued

DATE	LOCATION	EVALUATION
3	Dayton, Ohio	Unsolved
1	Key West, Florida	Possibly Balloon

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