

DECLASSIFIED

Auth: E012958
By: W07 NAPA Date: 9/15/00

August 25, 1954

Mr. Frank Frattolillo, Jr.
729 East 336th Street
New York, 66, New York

Dear Mr. Frattolillo:

I'm sorry; we don't have any pictures of flying saucers. In fact, the National Advisory Committee for Aeronautics doesn't know of the existence of flying saucers. The article to which you referred in your letter was one in which the NACA appeared to be quoted as saying things which, actually, the country's aeronautical research agency never said.

I am sending you a booklet about work the NACA does to help keep America strong in the air. I hope it will be interesting to you.

Sincerely yours,

Walter T. Bonney

Walter T. Bonney
Assistant to the Executive Secretary

WTB:mlt

FILE: Misc. F.

enclosure - black book.

Day File July-Dec
Folder 2 1954.
NACA
Public Affs Group
File Box 2

~~TOP SECRET~~

THE SECRETARY OF DEFENSE
WASHINGTON

7 October 1957

Photocopied
P, Quailer, Watman,
Holaday, Adams, Persons,
Hagerty, Haulow, Tyler,
Ford, Gartin, Custer, Hagan.
830 AM White House

MEMORANDUM FOR THE PRESIDENT

SUBJECT: Earth Satellite



The first serious discussion of an earth satellite as a scientific experiment to be incorporated in the program for the International Geophysical Year took place at a meeting of the International Council of Scientific Unions in Rome, Italy, in October 1954. At this meeting which Russian scientists attended, a resolution was adopted recommending--"In view of the advanced state of present rocket techniques, that thought be given to the launching of small satellite vehicles " We assumed at that time that the Russian scientists were innocently concurring in this resolution. It now seems likely that it was part of a deliberate plan.

We in Defense were concerned at that time about international reactions to a reconnaissance satellite that the Air Force was giving serious study to. It was felt that scientific satellites which would be clearly non-military and clearly inoffensive might help to establish the principle that outer space is international space. Thus, reconnaissance satellites traveling in it could not be objected to by the countries overflown because the space is free and the satellite itself is inoffensive in character.

~~TOP SECRET~~

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E.O. 12958, SEC. 3.6(b)
MR 96-43 #1
BY <u>B3m</u> DATE <u>5/14/98</u>

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FORM OF DOCUMENT	CORRESPONDENTS OR TITLE	DATE	RESTRICTION
Case file:			
9. Letter	Alan T. Waterman to Donald A. Quarles re satellite and IGY (2 pp.)	5/13/55	A (OSGP)
10. Memo	Robert Murphy to Alan T. Waterman re satellite and IGY (2 pp.)	4/27/55	A (State)
11. Memo	Alan T. Waterman to Robert Murphy re satellite and IGY (1 p.)	3/18/55	A (OSGP)
Case file:			
12. Report	U.S. Scientific Satellite Program, by the Office of the Assistant Sec. of Defense, Research and Development (3 pp.)	5/10/55	A (DOD)
13. Appendix	Financial Appendix to above report (2 pp.)	"	A (DOD)
14. Appendix	Technical Appendix to above report (4 pp.)	"	A (DOD)
15. Report	"World Opinion and the Soviet Satellite" by USIA (5 pp.)	10/17/57	A (ISA)
Case file:			
16. Report	"OCE Concern with the Earth Satellite Program" (3 pp.)	10/16/57	A (NSA)
17. Memo	OCE memo re Working Group on certain aspects of NSC 5520 (1 p.)	5/2/56	A (NSA)

WHITE HOUSE OFFICE, Office of the Special Assistant for National Security Affairs: Records, 1952-61

NSC SERIES, Briefing Notes Subseries
Box 7, Folder: [Earth Satellites] (3)

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SPUR ARMY STUDY

Reports of Objects Taken Up
by Ordnance Research
at Duke University

Special to The New York Times

DURHAM, N. C., Aug. 28—If there are satellites orbiting the earth fairly close to it, the Army Office of Ordnance Research will locate them.

That prediction was made here today by Col. Walker W. Holler, commanding officer of the O. O. R. at Duke University.

While Colonel Holler said that the ordnance-sponsored work in this field had not uncovered any satellites, a source close to the O. O. R. unit here described as "quite accurate" the report in the magazine Aviation Week that two previously unobserved satellites had been spotted and identified by Dr. Lincoln Lepaz of the University of New Mexico as natural and not artificial objects.

This source also said there was absolutely no connection between the reported satellites and flying saucer reports.

It is quite possible that the O. O. R. has reasons to believe these satellites exist, but is withholding its findings until more datum is uncovered.

Study Goes on in Secret

Colonel Holler, however, denies O. O. R. is withholding any information.

But, at the same time, he had this to say:

"If anything is uncovered, depending upon what is uncovered, all or some of it may be classified at the time. But not unless there's some real reason to do so.

"At present, the O. O. R.'s hunt for satellites isn't classified as secret."

Colonel Holler gave the opinion that "we have the best man available on this project in Dr. Clyde W. Tombaugh, discoverer of the planet Pluto."

"Dr. Tombaugh is among the foremost scientists in this field and if they [the satellites] are there, he has the equipment, the technique and the skill to find them," Colonel Holler added.

The O. O. R. chief admitted that Dr. Lepaz might have some information "we don't know about. We plan to do a great deal more work in this field in the future."

The idea of satellites orbiting the earth has intrigued astronomers for centuries.

Comment by Scientific Magazine

Aviation Week said the reported satellites had caused a Pentagon scare until they were identified as natural objects.

The magazine continued: "One satellite is orbiting at about 400 miles out, while the other track is 600 miles from the earth."

The article also stated that the "Pentagon has been alerted, the Russians here wanted it

United States with any project

to locate an earth satellite of the type described, we are not aware of all the work that may be going on outside of ordnance auspices," Colonel Holler declared.

"Release of details of possible future discoveries would necessarily be governed by considerations of military security," he added.

Comparatively small satellites circling close to the earth at tremendous speeds may have escaped observation, according to Dr. Lepaz has reported detecting two such natural objects, the O. O. R. plans to intensify its work in this field.

NVT

Aug 4 page 35

SCIENTIST DENIES SPACE BASE 'FIND'

Hunt Goes On for 'Platforms',
La Paz Says, but None Has
Been Discovered Yet

Special to The New York Times

ALBUQUERQUE, N. Mex., Oct. 9.—Discover a nice stable meteorite, revolving around our earth in satellite fashion, 400 to 600 miles above our sea level and big enough to be used as a scientific and military space platform, and you can save all of us taxpayers a few billion dollars in the coming years.

The authority for the above is Dr. Lincoln La Paz, noted mathematician and astronomer, who has headed the Institute of Meteoritics at the University of New Mexico since 1945. Dr. La Paz was referring to a recent magazine article that quoted him as authority for confirmation that two such natural space platforms already had been discovered. He said the article was "false in every particular, in so far as reference to me is concerned."

But, he added at the same time, the space platform search was not new and it was entirely possible that some such satellites might be discovered at any time, here or in foreign lands. Such discoveries, he made in Iron Curtain countries very likely would be kept secret for a time.

At any rate, he noted, no one in any country denied the search was on for such natural platforms. In fact, explicit reference to such a search sponsored by United States Army Ordnance Research was given in a paper, Dr. La Paz published in February, 1954, in the journal of the Astronomical Society of the Pacific.

Search for such "platforms," started purely as scientific investigation, is now recognized as of the highest military importance. The notion that has the only such space base could control the world, Dr. La Paz said.

These bases will have to be equipped before man can create and try his own artificial space islands. And there are major problems of maintenance, once such man-made objects are created and placed outside the earth's atmosphere. One is the protection of man from the dangers of cosmic rays, to which he then would be subject directly without benefit of the filtering effect of our atmosphere.

A second real danger, Dr. La Paz said, is from bombardment by cosmic particles which, passing a dense atmosphere to reach the space base, would be expected to cause a devastat-

ing speed. As a simple illustration of this, Dr. La Paz cites the comparatively small and light anti-tank shell, the high velocity of which allows it to penetrate thick, hardened steel armor. It is estimated thousands of tons of meteoritic material daily zoom into the earth's atmosphere, most of it being consumed by heat generated by its own drag through our air.

However, in establishing himself in space, man should plan for a "century satellite," Dr. La Paz believes. It is hoped that once situated and attuned to the earth's speed, the satellite would continue to revolve without danger of sinking into the earth's atmosphere for at least 100 years before requiring any additional "lift" or propulsion. That is, assuming, of course, it was not knocked out of position by a meteoritic shower. Perhaps devices to create its own atmosphere could be built for the platform.

Part of the basis for the work of Dr. La Paz, who has established an international reputation as a fireball chaser, has been his search for clues to the effect of cosmic radiation upon meteorites. Such investigation required speedy recovery of fallen meteorites, since the radioactivities induced by cosmic radiation generally have brief half-lives.

For that reason he has attempted, by publicity, when a fireball or shower has been reported, to find their landing places and recover them before

their radiation has been greatly reduced in intensity.

Dr. La Paz and his fellow-workers make frequent field trips following tips on meteorite displays. In one recent trek they investigated four reported meteorite craters in Colorado. None of these proved out, but the expedition gathered twenty-seven meteorites with weights up to five pounds from an ancient fall in the Chico Hills, of northwest New Mexico, where a 231-pound one was recovered by the Institute of Meteoritics in April of this year.

The writings of astronomical societies of many nations, including those which occasionally come from the iron curtain countries, indicate the worldwide interest in possible satellites. So the international race to be the first to use a space platform obviously is on, says Dr. La Paz.

With this, the economical importance of fireball study grows. If instead of sending expensive rockets into the upper atmosphere to bring back data, one can get the same information from the study of meteorites that are free, the taxpayer will get a real break.

The false reports of Dr. La Paz shuttling back and forth between White Sands Proving Ground and Mount Palomar Observatory and identifying two usable satellites where possibly hundreds are available, might be more amusing, he asserts, if the search for and need for such space bases were not so real.

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BOARD OF GOVERNORS

Dr. Marcus Bach, State University of Iowa, Iowa City, Iowa. Rev. Albert Baller, Robbins Memorial Church, Greenfield, Mass. Dr. Earl Douglass, religious writer and columnist, Princeton, N. J. Frank Edwards, Radio-TV commentator, Indianapolis, Ind. Col. Robert B. Emerson, USAR, Baton Rouge, La. Maj. Dewey Fournet, USAFR, former AF HQ monitor for the Air Force UFO project. Mr. J. B. Hartranft, Jr., President, Aircraft Owners and Pilots Association, Washington, D. C. Vice-Adm. R. H. Hillenkoetter, USN, Ret., formerly Director, Central Intelligence Agency, New York, N. Y. Rear Adm. H. B. Knowles USN, Ret., Eliot, Maine. Prof. Charles A. Maney, Defiance College, Defiance, Ohio.

N.Y. Affiliate News

The New York City Affiliate held a public meeting on January 13 at Adelphi Hall, Manhattan. Speakers included Lee Munsick, former NICAP Associate Editor, and Lex Mebane, an officer of CSI, N.Y. Mr. Mebane spoke on electromagnetic effects from UFOs, and Mr. Munsick showed UFO information slides.

The following slate of officers for NICAP NYC was elected in October: President--Miss Miriam Brookman (100 E. 21st St.; Apt. 221, Brooklyn 26); Executive V/P--Howard Morris; Admin. V/P--Alan Colodny; Vice-Pres.--Bill Blades; Recording Sec'y--Frank Dusek; Treasurer--Bill Pirro.

CAPT. RUPPELT IS DEAD

Capt. Edward J. Ruppelt, former head of the AF Project "Blue Book" UFO investigation, died last fall. We sincerely regret his passing. Ruppelt was instrumental in opening up the secretive UFO policy and revealing the existence of the secret AF conclusions that UFOs are real and interplanetary. Although the second edition of this book "The Report on Unidentified Flying Objects" last year was revised to debunk UFOs in three added chapters, this was believed done under pressure from the Air Force. His original findings as project chief still stand as an indictment of the official secrecy policy.

Copies of this issue will be sent to the chairmen and members of the Armed Services, Space, and Government Operations Committees of the Senate and the House, and to individual legislators who have shown concern over the problem. As funds become available copies will be sent to all members of Congress and to several hundred newspapers and broadcasting stations. Meantime, NICAP members are urged to show this report and the Congressional reply to their newspaper editors and radio-TV news directors, also to book reviewers, in case they have already reviewed the book.

Unexplained Satellites

Reports made over the past few years indicate that there may be satellite objects circling the earth which can not be explained as man-made. These reports have been made mostly by astronomers, not by laymen unfamiliar with the sky.

Reports of this sort actually began long before the launching of Sputnik I. In 1954 the Pentagon was reportedly alarmed over the discovery of two satellites orbiting the earth. Dr. Lincoln LaPaz of the University of New Mexico later allegedly identified the objects as natural: "two meteors" which had taken orbits around the earth -- one about 400 and one about 600 miles up. This published statement was later denied by LaPaz, and the facts were seriously questioned by others, so that the two objects were never satisfactorily explained.

During 1955-56 Dr. Clyde W. Tombaugh of New Mexico A & M College was conducting a search for natural satellites at the request of the Army. It was subsequently announced that nothing had been found.

In 1956 and 1957, however, similar inexplicable sightings were made by both professional and amateur astronomers, before and after the launching of Sputnik I.

Frank C. Clark, an amateur astronomer in New Mexico, saw an orbiting object September 8, 1956, during observations of the planet Mars. His account was printed in "The Strolling Astronomer" in October 1956.

To all the members who so kindly sent us Christmas cards, our belated thanks and best wishes for a happy and prosperous New Year.

Donald E. Keyhoe
Richard H. Hall

The special price-reduction to members, for the director's new book, "Flying Saucers: Top Secret," has been discontinued, at least temporarily, by the publisher. Checks received from members are being returned with our regrets and the hope that the reduction will be continued in the near future. Meantime, members desiring copies may secure them by order through local book-dealers, at \$3.95 or directly from G.P. Putnam's Sons, 210 Madison Ave., New York 16, N. Y.

Please send us reports of any UFO sightings in your area, with news clippings -- showing the name of the paper and the date -- if available. If you know anyone who is withholding an authentic UFO report for fear of ridicule, try to persuade him to send it to NICAP, on a confidential basis if necessary.

NICAP ADVISER DIES

We regret to report the death of Patrick J. Lucey, president of the American Association of Engineers, late last year. Mr. Lucey had served as a NICAP scientific adviser since October 1959.

PANEL OF ADVISERS

Astronomy:

Dr. James C. Bartlett, Jr., Baltimore, Maryland
Frank Halstead, former curator, Darling Observatory, Duluth, Minnesota
Kenneth Steinmetz, former head of "Moonwatch" program, Denver, Colo.
Walter N. Webb, lecturer, Charles Hayden Planetarium, Boston, Mass.

Other Sciences:

Jack Brotzman, physicist (electronics), Naval Research Laboratory, Washington, D.C.
Frank G. Rawlinson, physicist, National Aeronautics and Space Administration, Washington, D.C.
Dr. Leslie K. Kaeburn, biophysicist, University of Southern California, Los Angeles, California
Dr. Robert L. Hall, social psychologist and assistant professor, University of Minnesota, Minneapolis, Minnesota
Prof. N.N. Kohanowski, geologist and mining engineer, University of North Dakota, Grand Forks, North Dakota

Aviation & Missiles:

Capt. C.S. Chiles, Eastern Airlines, New York, N.Y.
Samuel Freeman, past president, National Aviation Trades Association, Bedminster, New Jersey
Capt. W.B. Nash, Pan American World Airways, Miami, Florida
W.R. Peters, former first officer, Pan American World Airways, Coral Gables, Florida
Capt. R.B. McLaughlin, USN, Commanding Officer, Naval Ordnance Laboratory, Corona, California
Morton Gerla, aviation ordnance, past director N. Y. chapter, American Rocket Society, Jamaica, N.Y.

Engineering:

Norman S. Bean, Director of Engineering Development, Station WTVJ, Miami, Florida
A. L. Cochran, electronics engineer, Richardson, Texas
Wilbert B. Smith, electronics engineer, Ottawa, Canada
Robert Beck, Color Control Company: electronics, optics, photography, Hollywood, California

Photography:

Ralph D. Mayher, news photographer, Station KYW, Cleveland, Ohio
Max B. Miller, Producer of Documentary Films, Cinematography, Los Angeles, California
Warrant Officer D.C. Newhouse, USN, Chief Photographer (Aviation), Coronado, California

News & Public Relations:

Albert M. Chop, former Air Force public information official on UFOs, Santa Monica, California
Lou Corbin, Chief, WFBR News Bureau, Baltimore, Maryland
George Todt, columnist, Los Angeles Herald-Express, Los Angeles, Calif.
James C. Beatty, public relations: Civil Defense, Washington, D.C.

Oct 1, 54 CRIFO Vol 1 #7

Long Springfield

THE EARTH SATELLITE ENIGMA -- ARE THEY MOSCOW'S ... METEORIC OR MARTIAN? Statements conflict, as usual. I first reported these two mysterious earth satellites in my April Newsletter ... then again, following Lt. Col. O'Mara's admission to me, June 8, that a govt. project was tracking the objects but that the evidence was conflicting.

*Intelligence
ATC
Kingston*

I heard nothing more until Aug. 3 when Edward W. Hermann, special agent for McGraw-Hill Publications, told me Dave Anderton, Engineering Editor of Aviation Week, had received a report from Dr. Lincoln La Paz regarding the satellites, and, that it would "appear in detail in a coming issue." In that a correspondent friend, Ted Bloecher of New York, tells me he tried dozens of newstands for the magazine, but to no avail (indicating a sudden scarcity) I will quote the August 23, 1954 issue of Aviation Week:

"Pentagon scare over the observance of two previously unobserved satellites orbiting the earth had dissipated with the identification of the objects as natural, not artificial satellites. Dr. Lincoln La Paz ... headed the identification project. One satellite is orbiting about 400 miles out while the other track is 600 miles from the earth. Pentagon thought the Russians had beaten the U.S. to space operations."

Now, the rest of the story, thanks to Ted Bloecher. Says Ted: "Being of a nature that is naturally suspicious of anything printed, I wrote Dr. La Paz and requested that he verify this release. I received an answer yesterday. (Sept. 8). In his letter, Dr. La Paz regrets 'that Aviation Week's misleading satellite story has received such widespread and uncritical publicity.' Enclosed also was the letter he (La Paz) had written to A.P. Strangely enough, the papers were content with carrying the false report, for I've seen no mention of Dr. La Paz's correction on this report."

Following is copy of letter, in part, by Dr. La Paz, to the Associated Press:

"Scientifically and militarily, the search for nearby satellites of the earth is one of the most important on which mankind has ever embarked. It is therefore unfortunate, although not surprising, that false rumors are bound to be circulated in regard to the nature and results of this search."

"As regards the Aviation Week story on the satellite search, summarized in the A.P. release shown me, it is false in every particular insofar as reference to me is concerned. ... No one representing Aviation Week has questioned me concerning any possible connection I may have with the satellite search program, and no one whatever has been authorized to credit me with the activities attributed to me in the Aviation Week story."

(Signed) Lincoln La Paz
Director Institute of Meteoritics

Your letters and clippings are greatly appreciated; each is carefully read and filed. Since the April Newsletter, more than 8000 letters have crossed my desk -- a tremendous load for just two people. My wife, Dell, handles all administrative details, subscriptions, mailing, etc., while I direct the research and prepare the Newsletter. We are both grateful for your kind letters and your enduring patience. KEEP THE MAIL COMING, but we're afraid to commit ourselves on a reply. The Newsletter is published first Friday of the month. Subscription \$2.00 a year, starting with June 1954 issue. Six month subscriptions starting in April terminate with Oct. issue. Mark RENEWAL clearly with remittance. Back copies of April, May, June issues available at 25¢ each. Foreign subscriptions (except Canada) are \$2.60 regular first class mail. Air Mail add 50¢ extra per issue of Newsletter.

UFO FOLLOWING VANGUARD REPORTED BY TRACKING CENTER

The Akron-Canton Satellite Tracking Group has reported an unidentified object which was following the Vanguard "weather" satellite in its orbit of the earth. Members of the group emphasized that it could not be the rocket booster, which had been sighted earlier. They said they had no explanation for the strange object.

If this was actually a UFO, it would appear to have been observing the Vanguard satellite. There have been several reports of UFO interest in earth-launched rockets, and one report of a so-called "ghost" satellite which was picked up by radar, after Sputnik I was put into orbit in 1957. (See general story on Vanguard)

continued

The UFOs' speed also varied, Capt. Killian told Mebane. At times, they would pull ahead quickly, then apparently lag as if to let him catch up. These movements were easily observed, since the airliner was flying a constant 300-degree course. The captain said some passengers asked him to fly closer to the objects, but he had to consider their safety, even if regulations had permitted this. Also, he added, he obviously did not have enough speed to catch up with the UFOs.

The Air Force Explanation

For three days, the AF was silent about these reports. Then on the morning of Feb. 28, it released to the press this official opinion of the Air Technical Intelligence Center:

The airline crews all had been misled by the Belt of Orion. Glimpsed through broken clouds, Orion's stars had created an illusion of fast-moving objects, deceiving the airline pilots.

To back it up, the AF stated that an Air Force transport crew flying from Washington to Dayton, that same night, had seen Orion through broken clouds at 8500 feet, and could vouch for the illusion.

To anyone knowing the facts, the AF explanation was preposterous. Capt. Killian was on record: He had seen BOTH Orion and the UFOs simultaneously - and in a clear sky. So had members of the other airline crews, and the night-flying experience of these airline pilots exceeded that of the average AF transport crews.

All this was well known at the Air Technical Intelligence Center. Despite this, the AF censors had deliberately cast doubt on the ability and integrity of these airline veterans.

If the AF claim were to be believed, there were only two choices: All six crews were befuddled - or lying.

Because of this ridiculous implication, suspicion about the AF transport story has been expressed. Specific details were not given: Names of the pilots; their night-flying experience; the plane's position and time when Orion was sighted through broken clouds, so that Weather Bureau records could be checked. (NICAP is asking for Weather Bureau reports along the Washington-Dayton route for that night.)

The AF story may be true - a lucky

coincidence which provided ATIC with something to publish as an answer to the airline reports.

But that explanation, applied to the airline sightings, is completely contrary to fact. And ATIC must know it.

After the AF story appeared, NICAP phoned Capt. Killian and asked his reaction. Killian firmly stood his ground.

"I certainly know Orion when I see it," he said. "It wasn't any brief look. During those 45 minutes I saw both Orion and the unknown objects repeatedly. So did other airline pilots."

"What do you think of this AF transport story?"

"Maybe they did see Orion through breaks in clouds. I can tell you this: No experienced airline pilot is going to be deceived like that - we've seen stars through cloud breaks thousands of times. And those other crews have confirmed what I reported."

"Also, in our area, the only clouds we had were about 3500 feet below us. Above that, visibility was unlimited - the sky was absolutely clear. Those other captains would testify to that. So could everybody on our flight; the cabin lights were switched off and they were all looking out."

At the time of this conversation, the AF statement in the *Herald Tribune* had already appeared. Capt. Killian was asked for a comment on the "sobering up" implication.

"Naturally, I don't like it," he said. "They know we don't drink before flights - it's one of our strictest rules."

Besides the AF statement, the *Herald Tribune* article had carried the following quotation from Capt. Killian:

"I am sure there are people on other planets who have solved the problem of space travel. I sincerely believe their vehicles are coming close to the earth."

"Is that quote correct?" Killian was asked.

"Yes," he said. "That is what I believe."

In order that NICAP members may realize the full import of the AF spokesman's statement, here is a summary of the main points:

1. The AF says it was jittery after World War II, when the Kenneth Arnold UFO report set off the public "saucer scare." But the AF techniques have now reduced evaluation of reports to a routine, with no excitement.

2. Sightings go in cycles caused by

UFO publicity on TV and radio, and in books and articles.

3. There is more sky awareness; more people are looking up, especially at night. Many have cold-war jitters, so they see flying saucers.

4. There are always some reports caused by intoxication.

5. There are some persons who actually have seen things they could not understand - because they lack the intelligence or knowledge to identify them as ordinary objects.

To illustrate this, the AF used the September 1958 case where Army man at a Nike base in Maryland reported a glowing UFO. This, said the AF statement, was actually a floodlight seen at a distance. (The AF did not mention that they had first told Washington newspapers the glow came from arc-welders' torches, on a power-company job - an attempted explanation the power company had refuted and forced them to change.)

6. Outside the military, there are many people and groups who insist interplanetary travel is going on. The AF knows about these people, said the spokesman, and there is not a word of truth in what they say, but they sell books and magazines and are making a good thing out of it. (This was worded as a condemnation of all UFO investigative groups, including NICAP. NICAP has not made a dollar's profit, and its claims are documented. But since the AF spokesman avoided names, and also hid behind anonymity, he is safe from lawsuit.)

NICAP's Evaluation

Taken together, the February 28th "Orion" explanation and the AF spokesman's statement were plainly meant to serve three purposes:

1. To offset the airline crew's reports.
2. As a warning to all airline pilots that they too would be officially ridiculed if they publicly reported UFO sightings.
3. To reduce the growing support on Capitol Hill for open UFO hearings.

It seems clear that the AF - or a higher agency dictating to the Air Force - is determined to block any Congressional drive for the truth. Beside this smearing of reputable observers, there is now a campaign to persuade Congressman that UFO hearings would actually be harmful because it would encourage the "science fiction writers" who insist on UFO reality. (See the report on Gen. W. P. Fisher's letter to Senator Harry F. Byrd, elsewhere in this issue.)

But the AF tactics in the recent airlines case may backfire on the censors. Though some airline pilots now swear they will never publicly report a UFO, others are aroused by the AF spokesman's statement. If the majority of airline pilots who have seen UFOs unite in self-defense, their combined testimony will have a powerful impact on Congress.

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UFO Investigator
 11 #1 July/Aug 61
 17

June 12; Waynesville, Ohio. An unknown object, described as "a ring of smoke with a ball of fire swinging around the outside," was seen for five minutes, before disappearing on a NE course.

June 19; Edinburgh, Scotland -- A cigar-shaped luminous object flashed overhead at terrific speed, visible for almost 30 seconds about 2:00 a.m. Witnesses told the Evening Dispatch (June 19) the UFO angled downward at about 25 degrees toward the northern horizon. An R.A.F. spokesman told the paper: "We know of this but we can make no comment on it whatsoever." Earlier in the evening, about 10:30 p.m., dozens of people over a wide area around Edinburgh sighted a fast-moving fireball travelling NW to SE trailing sparks.

MYSTERY SATELLITE TRACKED

The discovery that a mystery satellite was orbiting the earth was revealed May 19th by the Smithsonian Observatory at Cambridge, Mass., which controls a worldwide network of tracking stations. Extracts from the official statement follow:

"Satellite tracking stations around the world have been asked to help track an unsuspected, unpredicted bright satellite. The satellite was first spotted, on May 18, at Jupiter, Fla. The observatory is trying to get other sightings and an orbit. The satellite is about as bright as Echo One and can be seen early with the naked eye under right conditions."

At Haleakala, Hawaii, Clifton Marsh, head of the local observatory, said Smithsonian officials also had alerted its network of highpowered, telescopic cameras to spot and photograph the mystery satellite.

One unexplained factor was introduced by a Smithsonian spokesman who stated that they had "no reason yet to believe the satellite is anything new, because such orbiting mavericks are spotted with some regularity."

As this issue goes to press, the mystery satellite still has not been identified.

June 19; Exeter, England -- A mysterious "flying object" was reported to have hovered stationary over Exeter today for more than an hour.

Officials at the local airport said, "We do not know what it is."

"It was seen on the radar screen and we have had it under observation for some time. We think it is pretty big. It appears to be shining brightly and is about 50,000 feet up."

June 19; Washington, D.C. area. In a confidential statement, a radio technician at a Government agency reported sighting a brilliant UFO which either

divided into, or launched several smaller objects. Observed with 7-power binoculars, the small objects appeared round, less bright than the larger UFO first noted.

June 22; Altus AFB Oklahoma. In another confidential report, an AF member at Altus AFB described sighting of a UFO flying at the speed of a B-52, or faster, and an apparent chase by an F-89 jet just after the UFO disappeared from the observer's view.

June 22; Seattle, Wash. A cylindrical UFO which emitted an orange-colored exhaust was reported rising from a low altitude about sunrise. The object was described as tilting to a horizontal position, then disappearing behind trees. A few hours earlier, an oval or egg-shaped UFO, glowing an orange color, was reported settling toward the ground in the same area. (Report under investigation by APRA-NICAP Subcommittee in Seattle.)

June 26; New Brunswick, N.J. An elongated, orange-glowing UFO, reported by a local merchant, was observed hovering over the Albany Street Bridge about 3 a.m., then swiftly moving away.

July 1; Sacramento, Calif. Several residents reported a bright UFO which zig-zagged across the sky, occasionally hovering, with its light blinking on and off.

July 5; Mt. Hope, Wisc. A rotating object, with blue and red lights seen at times, was reported flying at a low altitude near Mt. Hope. According to press account, AF planes were sent to investigate, but Truax AFB denied knowledge of the report.

July 7; Muskegon, Mich. A UFO which "looked like two big metal bowls, one on top of the other, with a flashing light on top," was seen hovering at tree-top level. As reported to police by John Freeman and family, from Ft. Wayne Ind., the UFO rose silently after a few seconds, then climbed rapidly out of sight. As it moved, the flashing white light became steady.

July 9; Burlington, N.C. A bright UFO about twice the size of Venus was sighted at 7:42 p.m. (EST) by Wm. E. DeLoach, a security officer for a Western Electric plant, and another witness.

July 10; Pontiac, Mich. A blimp-shaped object flashing brilliant orange and white lights was sighted between 3:00 and 3:30 a.m. by dozens of witnesses, including police officers. Two teen-age boys, fishing at North Lake fled when the UFO began descending nearby. Other witnesses included: Police Sgt. David Putnam and Patrolman Fred Souver, Waterford; Deputies Robert MacFarlane and Richard Hubble, Independence (confirmation of hovering at treetop level); and Corporal Maitland Landon, State Police, who sighted "big, brilliant object at a high altitude and insisted it was not a balloon. Sergeant DeLoach told police they would investigate the sightings but no official report has been released to date.

double back eastward over the town. Total time of observation: 30 minutes.

May 27; Nashville, Tenn. -- A bright triangular object was seen over a wide area from 5:00 p.m. to sunset. Jets from Memphis Naval Air Station were scrambled but could not reach the altitude of the UFO estimated at 60,000 feet. Possible explanation: "Moby Dick" pyramid-shaped AF research balloon, but the Strategic Air Command in Colorado Springs, said no aircraft or balloons were known to be in the area. A photograph of the object obtained from the Nashville Tennessean by member Paul Norman is being analyzed by NICAP.

June 3; Manasca, Wisc. Reported by Police Chief Rod Taubel, a UFO was seen maneuvering over the area.

June 4; Blue Ridge Summit, Pa. -- A cigar-shaped or long elliptical UFO with a cluster of smaller unidentified objects were sighted in the early afternoon by Mrs. James W. Annis, librarian. At first the UFOs were motionless, then the smaller objects streaked across the sky to the large object. The UFOs were then obscured by trees in the foreground of the NE sky. Total time of observation: about ten minutes.

June 7; Helena, Mont. A UFO alternately hovering and moving at high speed, estimated at 100 feet in diameter by Under-sheriff Reed Collings, also was sighted by numerous Helena citizens. Collings, who observed the UFO with high-powered binoculars, said it seemed to be made of a "clear plastic" or similar material. A suggested "balloon" answer was ruled out by the UFO's high rate of speed when it disappeared on a southwest course. The weather bureau also stated it had no record of any balloon in the area.

June 9; Charleston, S.C. A rapidly moving round object, sighted between 10:30 and 10:45 a.m., was reported by three witnesses. One watching it with binoculars, described it as "fairly small, white with black around the edges. The 792d Aircraft Control and Warning Squadron stated that all objects appearing on its radar screens at the time had been identified.

ASTRONOMER SAYS "MYSTERY OBJECT" MAY BE SPACE SHIP

The strangely orbiting object which for over a month has puzzled the AF, civilian satellite trackers and astronomers may be a visitor from another world, according to Prof. Robert L. Brown, Director of Southern Connecticut State College Observatory. "Our civilization has made real progress only in the past 50 years," stated the observatory head. "Isn't it possible then that a civilization on a distant planet, much older than ours, could have progressed far more?"

The large mystery object, which orbits the earth intermittently—evidently changing its course at will—was first observed soon after Aug. 12, when the U.S. launched the big Echo balloon satellite. After this, UFO sightings—already on the increase—took a new spurt, beginning with the Red Bluff case.

Frequently an unknown, high-altitude device has been sighted and tracked as Echo passed over, causing speculation that the "mystery object" is a carrier ship which is launching observer units or that the "space ship" itself is checking on the orbiting balloon.

Astronomers' reports of the object include:

An Aug. 24 sighting by Georgetown University Observatory, just after the 8:49 pass of Echo over Washing-

(see next column)

ton. Horizon-to-horizon time, 2 1/2 minutes.

The Connecticut State College sightings, Aug. 24-25, reporting the red-glowing object moving "about three times as fast as Echo."

The Aug. 26 sightings by Adler Planetarium Director Robert Johnson and aides, at Chicago. Johnson publicly stated the object was a UFO.

"It was faster than any earth-launched satellite. And it orbited the wrong way—all our satellites are launched with the earth's rotation, for extra speed to escape the atmosphere."

The mystery device was photographed Aug. 25 by a tracking camera at Grumman Aviation Corp., L.I. (See LIFE, Sept. 7)

Sept. 26, Convair Aircraft engineer Tom Hemphill, head of the San Diego Moonwatch team, said he was convinced a huge mystery satellite was orbiting the earth.

Hemphill agreed with Dr. Johnson and other leading astronomers that the object could not be a manned Russian satellite launched secretly. Aside from the extreme difficulty of launching against the earth's rotation, he said, catching such a manned capsule would be like trying to shake hands with someone in a passing car, while the two machines were racing in opposite directions.

NICAP's request for AF conclusions has not been answered. However, at last reports, the Space Surveillance Control Center was still unable to identify the mystery object.

UFO SIGHTING INCREASE WORRIES AIR FORCE

The sudden spurt in UFO operations, after the Echo launching Aug. 12, is known to worry the AF because expert observers involved are not easily discredited. Among them: AF, airline, private pilots; FAA tower operators, missile engineers, astronomers, Moonwatch tracking teams, police, etc. Adding to AF concern is growing pressure from Congressmen.

From Aug. 13 to early October, many UFOs, singly and in formation, have been seen from coast to coast. Following are typical cases:

At Akron, O., FAA tower saw and reported to AF a rapidly maneuvering UFO. Eureka, Calif., Pilot Herb Hartley, 3 UFOs, one very large with six even-spaced lights. Oak Forest, Ill., Pilot Harry Deewester, Jr., former AF, in describing large, maneuvering UFO: "This was no conventional aircraft." Chicago, astronomer George Corao, 8-9 oval-shaped UFOs seen circling in echelon.

In one 48-hour period, scores of UFOs, often in formation, were sighted over San Francisco, L.A., 16 other California cities by police, engineers, pilots, etc. Manchester, N.H., Pilot Aime Dallaire: "It must have been controlled to behave as it did."

UFOs reported were mainly discs, (some with domes), and a few cigar or rocket-shaped UFOs seen, as at Toronto, Canada, and Rumney, N.H. In N.H. case, WW II AF pilot Kenneth Elliott stated object had blinking lights on the side, like portholes. Evanston,

(continued on page 4)

Congressmen, from page 2

Few Senators or Congressmen will disregard these dangers, once they see the evidence. Many are now completely unaware of the facts hidden by AF secrecy—or the sober conclusions of NICAP's experienced military men, scientists and engineers.

NICAP's letter forwarding the Confidential Report asked each legislator these six questions:

1. Do you agree with Gen. Chassin, NATO Co-ordinator, and the NICAP majority that we should openly confirm the existence of UFOs to avoid a danger of accidental war? Will you urge the Secretary of Defense to inform all defense personnel as to UFO characteristics, to prevent mistaking them for UFOs?

2. Do you believe airliners should be ordered by the AF to chase a UFO and aid jets in an interception, as in the April 8, 1956 case of Capt. Raymond Ryan, American Airlines, documented by NICAP? If you disapprove, will you so inform the AF, the Civil Aeronautics Board and the Federal Aviation Agency?

3. NICAP's Report cites AF Regulation 200-2, which forbids AF personnel even to discuss UFO cases with "unauthorized persons." It also cites an AF letter by Capt. G.H. Oldenburgh, Public Information Officer, stating it is against AF policy to release UFO information; and a statement by the Acting Commandant of the Coast Guard, that official UFO reports can not be released. On the basis of this and NICAP's documented cases, do you agree the AF has withheld UFO information and given contrary-to-fact reports to the public?

4. Do you agree, on the basis of NICAP documented evidence, and the majority Board and Adviser conclusions, that UFOs are real and under intelligent control?

5. Regardless of your personal belief, will you urge and support open hearings by either the Armed Services or Space Committees of the Senate or the House, in order to end the public confusion and the dangers cited? Do you agree such hearings should include testimony by NICAP officials and by expert pilots, tower operators, missile engineers, astronomers, radarmen and other trained observers who have seen, tracked or photographed UFOs?

6. Pending such hearings, do you favor the release of NICAP's documented evidence which proves the UFOs could NOT be USSR devices—this to serve as a stopgap and to avert the dangers mentioned?

The NICAP letter also indicated the increased Congressional disapproval of AF secrecy, by members of both political parties.

If you should mention the six NICAP questions in writing your Senators and Congressmen, they may answer them directly in reply, before sending the answers to NICAP. If so, please send us the letters as soon as possible; if you wish, we will copy and return the originals.

We earnestly hope to hear from a majority of the legislators by October 25. This will make possible a crucial move by NICAP. With the help of members and our increasing supporters on Capitol Hill, we are going to win this fight.

We are very grateful to the members who made it possible to finish the first part of this important Congressional project.

BOARD OF GOVERNORS

Dr. Marcus Bach, State University of Iowa, Iowa City, Iowa. Rev. Albert Baller, Robbins Memorial Church, Greenfield, Mass. Dr. Earl Douglass, religious writer and columnist, Princeton, N. J. Frank Edwards, Radio-TV commentator, Indianapolis, Ind. Col. Robert B. Emerson, USAR, Baton Rouge, La. Maj. Dewey Fournet, USAFR, former AF HQ monitor for the Air Force UFO project. Mr. J. B. Hartranft, Jr., President, Aircraft Owners and Pilots Association, Washington, D. C. Vice-Adm. R. H. Hillenkoetter, USN, Ret., formerly Director, Central Intelligence Agency, New York, N. Y. Rear Adm. H. B. Knowles USN, Ret., Eliot, Maine. Prof. Charles A. Maney, Defiance College, Defiance, Ohio.

N.Y. Affiliate News

The New York City Affiliate held a public meeting on January 13 at Adelphi Hall, Manhattan. Speakers included Lee Munsick, former NICAP Associate Editor, and Lex Mebane, an officer of CSI, N.Y. Mr. Mebane spoke on electromagnetic effects from UFOs, and Mr. Munsick showed UFO information slides.

The following slate of officers for NICAP NYC was elected in October: President--Miss Miriam Brookman (100 E. 21st St.; Apt. 221, Brooklyn 26); Executive V/P--Howard Morris; Admin. V/P--Alan Colodny; Vice-Pres.--Bill Blades; Recording Sec'y--Frank Dusek; Treasurer--Bill Pirro.

CAPT. RUPPELT IS DEAD

Capt. Edward J. Ruppelt, former head of the AF Project "Blue Book" UFO investigation, died last fall. We sincerely regret his passing. Ruppelt was instrumental in opening up the secretive UFO policy and revealing the existence of the secret AF conclusions that UFOs are real and interplanetary. Although the second edition of this book "The Report on Unidentified Flying Objects" last year was revised to debunk UFOs in three added chapters, this was believed done under pressure from the Air Force. His original findings as project chief still stand as an indictment of the official secrecy policy.

Copies of this issue will be sent to the chairmen and members of the Armed Services, Space, and Government Operations Committees of the Senate and the House, and to individual legislators who have shown concern over the problem. As funds become available copies will be sent to all Members of Congress and to several hundred newspapers and broadcasting stations.

Meantime, NICAP members are urged to show this report and the Congressional story to their newspaper editors and radio-TV news directors, also to book reviewers, even if they have already reviewed the AF book.

UFO Investigator
Section 10-61 page 8
Unexplained Satellites

Reports made over the past few years indicate that there may be satellite objects circling the earth which can not be explained as man-made. These reports have been made mostly by astronomers, not by laymen unfamiliar with the sky.

Reports of this sort actually began long before the launching of Sputnik I. In 1954 the Pentagon was reportedly alarmed over the discovery of two satellites orbiting the earth. Dr. Lincoln LaPaz of the University of New Mexico later allegedly identified the objects as natural: "two meteors" which had taken orbits around the earth -- one about 400 and one about 600 miles up. This published statement was later denied by LaPaz, and the facts were seriously questioned by others, so that the two objects were never satisfactorily explained.

During 1955-56 Dr. Clyde W. Tombaugh of New Mexico A & M College was conducting a search for natural satellites at the request of the Army. It was subsequently announced that nothing had been found.

In 1956 and 1957, however, similar inexplicable sightings were made by both professional and amateur astronomers, before and after the launching of Sputnik I.

Frank C. Clark, an amateur astronomer in New Mexico, saw an orbiting object September 8, 1956, during observations of the planet Mars. His account was printed in "The Strolling Astronomer" in October 1956.

To all the members who so kindly sent us Christmas cards, our belated thanks and best wishes for a happy and prosperous New Year.

Donald E. Keyhoe
Richard H. Hall

The special members, for the dire "Flying Saucers: I been discontinued, at by the publisher. Che members are being r regrets and the hope t will be continued in Meantime, members de secure them by order th dealers, at \$3.95 or di Putnam's Sons, 210 Ma York 16, N. Y.

Please send us rep sightings in your clippings -- showing paper and the date -- you know anyone who authentic UFO report cule, try to persuade NICAP, on a confidenti sary.

NICAP ADVIS

We regret to report the death of Patrick J. Lucey, president of the American Association of Engineers, late last year. Mr. Lucey had served as a NICAP scientific adviser since October 1959.

PANEL OF ADVISERS

Astronomy:

Dr. James C. Bartlett, Jr., Baltimore, Maryland
Frank Halstead, former curator, Darling Observatory, Duluth, Minnesota
Kenneth Steinmetz, former head of "Moonwatch" program, Denver, Colo.
Walter N. Webb, lecturer, Charles Hayden Planetarium, Boston, Mass.

Other Sciences:

Jack Brotzman, physicist (electronics), Naval Research Laboratory, Washington, D.C.
Frank G. Rawlinson, physicist, National Aeronautics and Space Administration, Washington, D.C.
Dr. Leslie K. Kaeburn, biophysicist, University of Southern California, Los Angeles, California
Dr. Robert L. Hall, social psychologist and assistant professor, University of Minnesota, Minneapolis, Minnesota
Prof. N.N. Kohanowski, geologist and mining engineer, University of North Dakota, Grand Forks, North Dakota

Aviation & Missiles:

Capt. C.S. Chiles, Eastern Airlines, New York, N.Y.
Samuel Freeman, past president, National Aviation Trades Association, Bedminster, New Jersey
Capt. W.B. Nash, Pan American World Airways, Miami, Florida
W.R. Peters, former first officer, Pan American World Airways, Coral Gables, Florida
Capt. R.B. McLaughlin, USN, Commanding Officer, Naval Ordnance Laboratory, Corona, California
Morton Gerla, aviation ordnance, past director N. Y. chapter, American Rocket Society, Jamaica, N.Y.

Engineering:

Norman S. Bass, Director of Engineering VJ, Miami, s engineer, s engineer, 1 Company; hotography, otographer, hio umentary ps Angeles, ouse, USN, on), Coron- ns: Air Force on UFOs,

Lois Corbin, Chief, WRBR News Bureau, Baltimore, Maryland
George Todt, columnist, Los Angeles Herald-Express, Los Angeles, Calif.
James C. Beatty, public relations; Civil Defense, Ground Observer Corps, Rye, New York

UFO Investigator

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holiday weekends we have several times a year.

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CAR BUZZED BY SAUCER IN INDIANA

Greencastle, Indiana -- Four Greencastle youths, Jack Glover, George Bennett, Jerry Brattain, and Bob Coleman, were driving home to Greencastle from nearby Russelville. While on Rt. 234 their attention was attracted to a huge red light in the sky, and they parked to get a better look at it.

As soon as they stopped the car the red light moved over them and descended to about 200 feet above them.

"It wasn't shaped like anything we had ever seen," said Glover. "It appeared to be about 50 to 100 feet in size, equipped with large white lights on each side. Several other colored lights were also visible." All agreed the thing was kidney shaped.

Somewhat frightened, but intensely curious, the boys flashed the car spotlight on the object, but after that didn't take the time to obtain a better look. For as soon as the light hit the saucer, it descended toward them rapidly, discharging an object which entered the car and exploded against Gover's cheek after bouncing from the floor. Then the object shot upward at great speed and, "moved north like a bolt of lightning" to quote Glover.

Kenneth Bennett, father of George Bennett, was convinced his son was telling the truth. "After knowing my boy for 17 years," Bennett said, I should be able to tell whether he is telling the truth. I've fed, clothed and schooled him all these years, and I don't think he'd lie to me".

Bennett added that he had "never seen a bunch of boys as excited" as the group was when they rushed into his house, out of breath, after the incident.

Questioned further about the "bomb", Bennett's son said it exploded "like a loud hand-clap," leaving no burns. After the explosion the boys found yellow, purple and blue fragments on the floor of the car, but said the fragments in no way resembled the paper left from an exploded Fourth of July firecracker. They had turned the fragments over to a local chemist, Bennet said, but at that time had received no report.

There was no odor during the incident, though Bennett described an odd noise accompanying the sighting. "It was a real soft noise--not at all like the noise a plane makes," Bennet said. When asked if it were a

hum, he said, "that is more like it". The boys had no idea how the object had entered the car, but presumed it was from the saucer.

The State Police were notified of the incident, and Putnam County Sheriff Joe Rollings said that his office had received several other reports from residents in the northwest part of the county that they too, had seen saucers resembling the type reported by the four boys.

(Credit for this very interesting incident goes to Gray Barker of THEY KNEW TOO MUCH ABOUT FLYING SAUCERS, fame. Gray publishes the Saucerian Bulletin, Box 2228, Clarksburg, W. Va., six issues for \$2.00. A very fine and informative publication. S.P.A.C.E. recommends this one. It is tops.)

* * * * *

Unfortunately when four teenagers come up with a fantastic tale there is always the chance it was a prank. We had one of those a couple of years ago, here in Miami. A group of teen age boys concocted a tale and called a local daily paper, which fell for the story, and then had to "eat crow" the following day when they came out and branded the story a hoax.

This sort of thing of course is not good for the good of Saucer Research, and is the reason why newspapers are often reluctant to publish sightings. But boys will be boys---and maybe drag racing gets a little dull after a while.

Incidentally, at press time we did not have the date on the Indiana car buzzing incident, which is the reason it was omitted. The report was run in the INDIANAPOLIS NEWS.

* * * * *

CLYDE TOMBAUGH SAYS IT AGAIN!!!!

LIFE BELIEVED ELSEWHERE IN PLANET SYSTEM-- Las Cruces, N. M., August 15---The man who discovered the planet Pluto says many astronomers agree, purely on the basis of the laws of chance, that life may exist elsewhere in the universe.

Clyde Tombaugh, a member of the staff of New Mexico A & M College, said in an interview that our planet is one of several revolving about one of billions of suns.

"It is the sheerest egotism," he said, "for man to believe that the universe was created for his special benefit, or even for life at all."

(Credit, Miami Daily News, Dallas Times Herald, Liz Borries and numerous others.)

* * * * *

Like the Abominable Snowman mystery, S.P.A.C.E. believes its readers are interested

RAND's Satellite Study Section staff included, in 1946: James E. Lipp (the Satellite Study Section Chief), F. J. Krieger, G. H. Clement, R. W. Krueger, G. Grimminger, W. C. Peters, Y. M. Claeys, E. Tie-man, R. S. Paulson, I. Munson, and B. L. Dodge.

Project RAND's second quarterly report contained an overview, *Status of Satellite Study*, RA-15006, dated September 1, 1946. RAND's work in the aftermath of the May 1946 report required a decoupling of imagination from the experience with high-altitude technology in World War II. In a war replete with breathtaking technological advances, the United States had experienced only modest incremental development in rocket technology and in high-altitude reconnaissance systems. Hence, RAND recommendations in 1947-51 that assumed a potential for rapid development of rocketry and reconnaissance technologies should be interpreted against the backdrop of limited wartime technological progress in these areas.

Also contained in RAND's second quarterly report was a summary of the COMET Project. (See RA-15004, September 1, 1946, pp. 36-40.) This project was an outgrowth of an earlier RAND idea to use a V-2 rocket to "shoot the moon" by launching into the moon's gravitational field. The COMET variant would eject particles from a high-velocity shaped-charge. These would create a cometlike object that could be observed from the earth's surface and that might be compared with the phenomena of actual comets. (See Fig. 2.)

It was the February 1947 RAND report, and not the May 1946 report, that first analyzed the potential of satellites for reconnaissance missions. From a 1980s perspective, there is no novelty in this emphasis upon the special potential of space reconnaissance rather than upon other potential uses of space satellites. But in 1947 an act of faith was required in the capacity to make dramatic improvements in high-resolution photography to anticipate the utility of space-based imaging of the earth.

Compared with the development of technology for radar, atomic weapons, and computers, the advances in photographic reconnaissance technology during World War II had been modest. Aerial photoreconnaissance, developed in World War I, was generally viewed as an operational function and not a technology development during World War II. Photographs were required immediately, and research tended to focus upon small improvements that could be brought to operational readiness in a matter of days or months, not years.

Amrom Katz addresses the lack of significant progress during World War II in improving the quality of photographic images:

September 1, 1946



The trajectories of the ejected material are shown in Fig. 16. The vertically mounted charge will shoot out a cloud of matter in the direction in which the V-2 is pointed at the peak of its trajectory. It is calculated that this matter will not be appreciably decelerated by the atmosphere above an altitude of 100 miles if the particles are larger than 0.01 cm in diameter. It is estimated that when illuminated by the sun this material would have an equivalent reflective area of about 1 square meter and would be visible against the night sky for a distance of a few hundred miles. Its trajectory and velocity may be measured by means of two standard rotating shutter meteor cameras.

Fig. 2—A page from Project RAND Report RA-15004, September 1, 1946, describing the COMET payload

Put simply, World War II standards for aerial photographic performance were of the order of 10 lines per mm. Under favorable conditions . . . cameras in the hands of skilled laboratory personnel based in the United States could achieve 20 or 25 lines per mm. But this wasn't achieved uniformly. . . .

By and large, lens performance matched the then available film, which was principally Kodak Aerographic Super XX, a relatively fast, coarse-grained, low-contrast film, with a speed rating that amounts to about ASA 100.

One must inquire deeply into the reasons for lack of progress (during the course of the [second world] war) in improving lenses, resolution, and general quality of the photographic image.

The main reason seems to have been that cameras developed in World War II were direct and linear descendants of cameras available at the beginning of that war. The essentially square or rectangular format, flat film, essentially standard mountings, etc., and especially standard film magazines, prevented novel cameras from being introduced. Furthermore, the fact [is] the film itself imposed a serious limit on image performance and image definition, and precluded making giant steps in lenses. Besides, World War II was, as more recent experience shows, fairly brief (except, of course, to participants therein). The current great popularity, well deserved, of panoramic cameras leads one to inquire how come there were no panoramic cameras developed during World War II. The reasons lie in the complex production operations, inventories, standardization of equipment, viewers, processors, etc., that go to make up a standard operational package.

... It is a curious fact that the panoramic camera, at least 100 years old ... was invented specifically because lenses of 100 years ago were resolution limited, and could not cover a wide angle. In the effort to get a wide angle, the lens was scanned across a semicircular piece of film, as in the familiar photographs taken at picnics, class reunions, graduating ceremonies, and the like. Thus, a lens which could inherently cover only a small angle was made to sweep out a large angle giving acceptable definition over the entire field.

... To a new generation of workers accustomed to this extremely high resolution, it may come as a shock to realize the desperate clawing and fighting that was required to increase resolution from 10 to 20 lines per mm, from 20 to 40. High resolution is an extraordinarily fragile commodity; it can be lost by temperature gradients, vibration, mechanical errors, and even requires special handling once it is brought into the laboratory. ... (Katz, 1970, pp. 1, 4, 5, 10, 11)

On February 1, 1947, Project RAND published a series of documents intended to assist contractors in preparing their own preliminary designs and analyses. These reports were:

1. *Flight Mechanics of a Satellite Rocket*, RA-15021
2. *Aerodynamic, Gas Dynamics and Heat Transfer Problems of a Satellite Rocket*, RA-15022 (limited distribution)
3. *Analysis of Temperature, Pressure and Density of the Atmosphere Extending to Extreme Altitudes*, RA-15023 (superseded by RM-841)
4. *Theoretical Characteristics of Several Liquid Propellant Systems*, RA-15024 (withdrawn)
5. *Stability and Control of a Satellite Rocket*, RA-15025 (withdrawn)
6. *Structural and Weight Studies of a Satellite Rocket*, RA-15026 (withdrawn)

7. *Satellite Rocket Powerplant*, RA-15027 (limited distribution)
8. *Communication and Observation Problems of a Satellite*, RA-15028
9. *Study of Launching Sites for a Satellite Projectile*, RA-15029
10. *Reference Papers Relating to a Satellite Study*, RA-15032

A summary report, *Proposed Type Specification for an Experimental Satellite*, RA-15013, was also published. (See Fig. 3.)

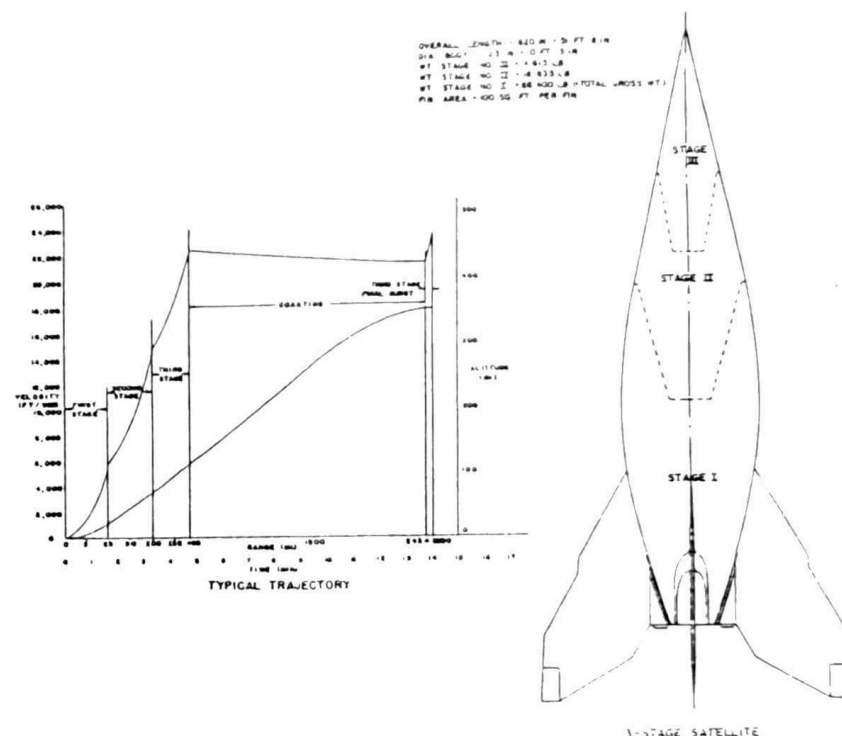


Fig. 3—Schematic of three-stage satellite launcher and typical trajectory from *Proposed Type Specification for an Experimental Satellite*, RA-15013, February 1, 1947

James E. Lipp's *Reference Papers Relating to a Satellite Study*, RA-15032 (item 10, above), contained papers by RAND consultants Lyman Spitzer, Jr., Luis W. Alvarez, Leonard I. Schiff, and Bruno Rossi treating perturbations of satellite orbits, methods of navigation and control, use of nuclear energy in satellites, establishment of missile trajectories, determination of satellite orientation in space, and cosmic ray research. Two papers commented on the potential significance of reconnaissance satellites.

Professor Lyman Spitzer, Jr., a Yale University astronomer, discussed "tactical uses of a satellite in naval warfare" and "problems involved in attacking or defending a satellite." (Lipp et al., 1947, pp. 39-40)

Assuming significant limits in resolving objects on the earth from a space satellite, Professor Spitzer proposed an ocean-surveillance mission:

An important property of a satellite is that it provides a platform from which a very wide expanse of the earth can be viewed. While small objects, especially on land, could probably not be distinguished from a point many hundreds of miles away, a ship at sea could, in principle, be detected. A ship 25 feet wide would subtend an angle of 2 seconds of arc at a point 500 miles away. Thus a telescope of 4 inches aperture, with a resolving power of one second of arc, should be able to detect such a ship, provided the weather were clear. . . . A satellite travelling over the poles, with a period of about one and a half hours, would scan the oceans at least once every day. . . .

Another potential advantage which a satellite might provide is that of a relay station for communications with naval vessels when radio silence was imperative. . . .

It is evident that some interest attaches to the problem of destroying an enemy satellite or of protecting a friendly one. Periodic changes in a satellite orbit would probably exhaust fuel rather rapidly, and thus a satellite orbit must probably be assumed fixed, except for calculable perturbations. Hence any satellite which has been detected could readily be attacked with considerable accuracy from another satellite sent up especially for the purpose. Such an attack satellite might be a relatively small and inexpensive weapon.

While the odds of such a battle in space are not readily forecast, it is evident that concealment would be a primary defense of a satellite. . . .

Professor Spitzer's proposed application of astronomical telescopic concepts to space satellites, undertaken in 1946-47 as a RAND consultant, encouraged the adaptation of long-focal-length sensing systems for observation of the earth, and, over the next four decades, the development of space telescopes for astronomical observation outside

the mantle of the earth's atmosphere. Various space telescopes have already been operated successfully, and the largest, NASA's Hubble Space Telescope, now awaits launch by a U.S. space shuttle. (Homer E. Newell, *Beyond the Atmosphere*, NASA, SP-4211, 1962; Armin J. Deutsch and Wolfgang B. Klemperer, editors, *Space Astronomy*, Academic Press, 1962.)

James Lipp of the Project RAND staff wrote the final section of the February 1947 report, "The Time Factor in the Satellite Program." Lipp proposed that a cost of about \$75 million for the first satellite orbit (about \$425 million in 1987 dollars) could be reduced by waiting for advances in fuels, materials, and techniques. He relied upon a companion cost projection by J. H. Gunning, *Cost Estimate of an Experimental Satellite Program*, Project RAND, RA-15030, also published February 1, 1947.

Lipp explored four classes of benefits to be derived from a satellite program: (1) development of long-range rockets, (2) value in military planning and operations, (3) scientific research, and (4) psychological and political factors.

He noted two characteristics of satellites, apparently without knowledge of their earlier identification by the science fiction writer Arthur Clarke in 1944: the concept of the polar orbit for recurring reconnaissance coverage; and the less obvious concept of very-high-altitude orbits for geostationary location compensating for the rotation of the earth:

A number of satellites at great altitude (thousands of miles) could act simply as communications relay stations. By using microwave frequencies the present difficulties with unreliable long-range communications would be avoided. It has been stated by eyewitnesses that such difficulties constituted a major handicap to operations in the Pacific theater during World War II. If a satellite could be placed high enough (about 25,000 miles) to have a 24-hour period of revolution, it could be associated with a fixed ground station at the equator. Three such stations could broadcast to most of the globe. This idea is not as wild as it sounds. The initial gross weight, with several additional stages, would be about four times the weight of a 300-mile altitude vehicle of equal payload.

This reference to geostationary satellites to relay communication appears to have been the first engineering proposal for development of this concept. (The earlier suggestion by science fiction writer Clarke was not in the mainstream of engineering literature, and thus was less likely to be noted by Lipp and his staff.)³ Two years later, another

³See Arthur C. Clarke, "A Short Pre-History of Comsats, or: How I Lost a Billion Dollars in My Spare Time," in Clarke, *Voices from the Sky: Previews of the Coming*

member of the RAND staff, Richard S. Wehner, published RAND Research Memorandum RM-603, *Satellite-to-Surface Communication—Equatorial Orbit*, further developing the Lipp concept of equatorial orbiting communications satellites.⁴

For the first time in a paper on satellites, the February 1947 Lipp report addressed the potential use of satellites to obtain electro-optical images and to transmit them using television-like technology:

By installing television equipment combined with one or more Schmidt-type telescopes in a satellite, an observation and reconnaissance tool without parallel could be established. As mentioned previously in various reports on the subject, a spaceship can be placed upon an oblique or north-south orbit so as to cover the entire surface of the earth at frequent intervals as the earth rotates beneath the orbit.

Also for the first time, the Lipp report proposed the use of relay satellites for microwave communications:

A satellite in the ionosphere would require microwave communication, which is effective only for line of sight distances and cannot be received halfway around the world. This trouble can be overcome by using a relay system involving both satellite and ground stations. . . . If the satellite could accumulate information on film or wire and televise the record rapidly when interrogated by the ground station, a workable system would result. The period of revolution of the satellite is about 1-1/2 hours, so that its successive tracks over the earth would be about 1500 miles apart at the equator. If it is assumed that scanning to a distance of 100 miles on each side of the track is feasible, then a complete coverage of the earth would require about a week, depending upon a proper choice of altitude to give the right orbital period. For more rapid coverage, two or more vehicles could be placed in a "rat race" equally spaced around the same orbit. Obviously, scanning and recording would only be done over areas of interest in order to conserve power and space in the vehicle.

A decade before Sputnik, the same report foresaw the symbolism of innovation in the exploration of space:

Although trips around the moon and to neighboring planets may seem a long way off, the United States is probably in a better position at present to progress in this direction than any other nation.

Space Age, New York, 1965, pp. 119-128. John R. Pierce of the Bell Laboratories, writing under a pseudonym in *Amazing Science Fiction*, suggested a comsat system in 1952. See also Delbert D. Smith, *Communications via Satellites: A Vision in Retrospect*, 1976.

⁴Wehner's RM-603 was classified Secret when published in July 1949. It was republished in April 1951 as a technical companion to RAND Reports R-217 and R-218 on reconnaissance and meteorological satellites. It was declassified before being withdrawn from further distribution in December 1952.

Since mastery of the elements is a reliable index of material progress, the nation which first makes significant achievements in space travel will be acknowledged as the world leader in both military and scientific techniques. To visualize the impact on the world, one can imagine the consternation and admiration that would be felt here if the United States were to discover suddenly that some other nation had already put up a successful satellite.

Lipp ends his report with these observations:

In conclusion it is hardly necessary to point out that most of the reasons for beginning a satellite development program cannot be assigned values in terms of dollars and cents lost in each year of delay. It is equally clear that some of the items discussed are of sufficient importance that the probable cost of the project becomes insignificant. It is therefore desirable that a satellite development program should be put in motion at the earliest possible time.

The Air Force apparently deferred a formal assessment of its work until September 25, 1947, one week after the official creation of the U.S. Air Force, itself. The Air Staff directed the Air Materiel Command (AMC) to assess the RAND work. AMC reported to the Staff in December 1947 its concurrence on the feasibility of satellites, but questioned their practicality. It proposed, however, establishment of a project to prepare Air Force requirements specifications for satellites, recognizing at the same time that development of guided missiles had higher priority. On January 1948, General Hoyt S. Vandenberg stated that the USAF "has the responsibility for satellite[s] . . ."; the next day, the U.S. Navy drew its claim for control of space satellite development. (Perry, p. 2; Augenstein, 1982, pp. 4-5)

Merton Davies recalls this period under Douglas Aircraft, during RAND's transition to independence as a separate non-profit corporation:

I arrived at RAND in 1947 just after the publication of this study and worked on missile and satellite structures under George Clement

RAND was an exciting place. Three major breakthroughs had emerged from World War II which were bound to change the course of history: radar, nuclear bombs, and jet and rocket propulsion. Rocket propulsion was the only area in which the United States had no experience, and we were trying to correct that. We studied the design and experience of the German A-4 (V-2) missile, as well as the A-9 glide version and the long-range A-10 design. RAND made a major study of the capabilities and costs of long-range glide missiles.

The Air Force had contracted with a number of the aerospace firms to make studies of missile design and cost. Typically these were the

It was during the military conflict in Korea that Colonel Leghorn articulated a strategic rationale for pre-hostilities reconnaissance. Before returning to civilian life in January 1953, he summarized his views in a memorandum for General Vandenberg (through Colonel Schriever and General Craigie), "An Air War Strategy of Disarmament, and Obsolescence of the 'Strategic Offensive'."

This memorandum... attempts to summarize factors which... argue strongly for an air strategy of disarmament, including a discontinuance of the strategic offensive in the World War II sense....

The term "an air strategy of disarmament" is used to signify the following:

- a. Primary use of atomic-thermonuclear air power during the military decisive phase against military forces-in-being and military stocks....
- b. Use of atomic air power against the Soviet logistics system.
- c. Suspended use of atomic air power against the Soviet economy... during the military decisive phase....

... Our war strategy must permit meaningful utilization of our atomic superiority and must endeavor to draw his atomic sufficiency to another target system. This requires a counterforce type war, which we have only begun to embrace in our planning....

Current development planning indicates the probable technical feasibility of such a disarmament concept. Our qualitative intelligence and reconnaissance capabilities constitute the primary problems, and without extraordinary action, these might delay adoption at operational planning levels of strategies with emphasis on counterforce operations. (Leghorn, Draft Memorandum, January 27, 1953, Formerly Secret, declassified March 24, 1972)

Colonel Leghorn's proposed counterforce strategy—voiced nearly a decade before Secretary of Defense Robert S. McNamara's Ann Arbor speech in 1962—implied a state of peacetime knowledge of a potential adversary's strategic assets. Hence, the key recommendation in Colonel Leghorn's memorandum was for a vigorous program to strengthen U.S. peacetime reconnaissance capabilities:

... Immediate and vigorous steps [should] be taken to strengthen air intelligence and reconnaissance capabilities, which will be necessary before any sort of a disarmament strategy can be contemplated. Because of the demonstrated inability of [the] air intelligence and reconnaissance community to pull itself up by its own bootstraps, extraordinary action will be required directly by the Chief of Staff. (Leghorn, Draft Memorandum, January 27, 1953, p. 7, Formerly Secret, declassified March 24, 1972)

Understandably, primary emphasis was placed upon aerial reconnaissance, long practiced and well understood. Merton Davies convinced Colonel Leghorn to include the role of the reconnaissance satellite within the framework of Air Force requirements. This was a critical but undocumented event. Colonel Leghorn's impact upon RAND research continued long after he left the Air Force in January 1953. Colonel Bert Smiley was to replace Colonel Leghorn as the principal liaison officer with RAND on long-range requirements for reconnaissance, with emphasis on tactical reconnaissance in conflict. The Leghorn legacy, a commitment to improve peacetime reconnaissance, remained as part of the reconnaissance and intelligence requirements.

In 1953 RAND moved its operations from downtown Santa Monica to its present headquarters at 1700 Main Street in the City Hall area, near the Pacific Ocean (Fig. 8).

I-7. THE BEACON HILL STUDY: RECONNAISSANCE WITHOUT SATELLITES

Colonel Leghorn presided over a review of long-range Air Force development requirements for intelligence and reconnaissance. One of the elements of the Air Force planning process involved the BEACON HILL study conducted under the auspices of MIT between July 1951 and the issuance of a final report on June 15, 1952, *Problems of Air Force Intelligence and Reconnaissance*.

The Air Force contacted MIT in May 1951 for the purpose of initiating Project LINCOLN, under the chairmanship of Dr. Carl F. J. Overhage. A study of intelligence and reconnaissance requirements and capabilities became the first Project LINCOLN study. It is notable that, despite multi-institutional representation, no member of RAND served on the steering committee that planned a series of briefings for early 1952, and that supervised the drafting of the BEACON HILL report of June 1952. Despite Air Staff receipt of the April 1951 RAND reports on reconnaissance and meteorological satellites, not a single BEACON HILL briefing considered the potentials of satellites for electro-optical or weather reconnaissance, subjects under consideration at RAND for the previous several years. This was not the result of security compartmentation, because no special compartmentation affected those RAND studies at that time. The Steering Committee membership for the BEACON HILL study was drawn exclusively from educational and industrial firms in New England.

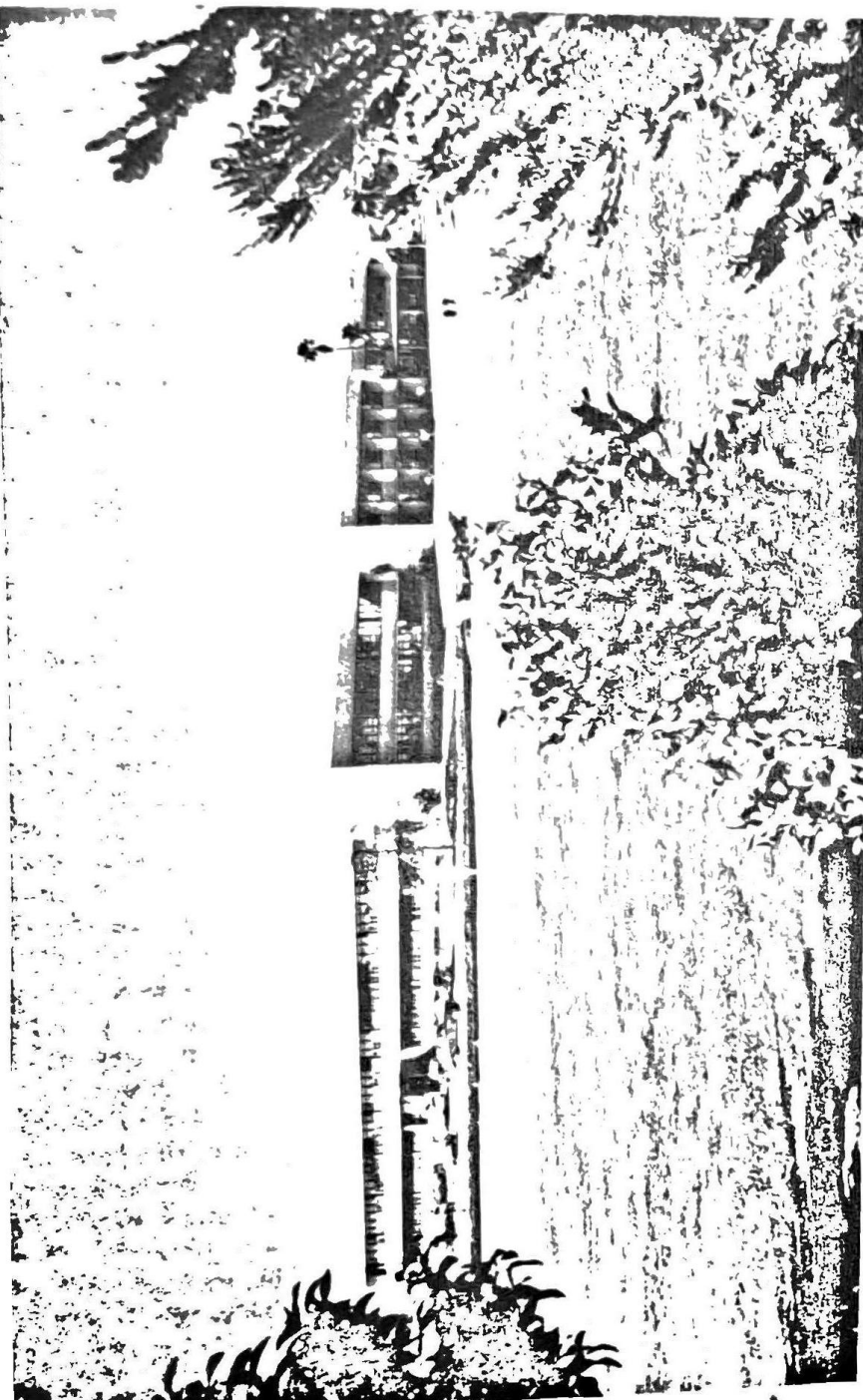


Fig. 8—In 1953 RAND moved into its new building at 1700 Main Street, Santa Monica

About the time of the initial organization of the BEACON HILL study in July 1951, Colonel Leghorn prepared a five-page document (mentioned above): "Comments on Intercontinental Reconnaissance Systems, 1952-1960."

Recent analyses have established that certain objectives must be sought in reconnaissance systems. These objectives fall broadly in two groups. . . . Pre-"D"-Day Reconnaissance and Post-"D"-Day Reconnaissance. A short intense campaign as contemplated by SAC requires the collection of as much planning information as possible prior to "D"-Day. As the SAC striking capability improves with improved development and production of atomic weapons and high performance, invulnerable vehicles, need for Pre-"D"-Day intelligence assumes even greater relative importance.

. . . Vehicles for Pre-"D"-Day Reconnaissance must meet the following requirements:

1. Minimum chances of detection.
2. Minimum chance of interception.
3. An unmanned vehicle is greatly preferred.
4. The vehicle configuration must lend itself readily to a "cover plan" excuse such as a scientific or weather mission gone astray.

Whether or not the State Department will acquiesce in the use of any of these vehicles, the Department of the Air Force must fully develop a technical capability for Pre-"D"-Day Reconnaissance. . . . (Leghorn, 1951, p. 1)

Just three months after the April 1951 publication of RAND Report R-217 on electro-optical reconnaissance satellite concepts, Colonel Leghorn proposed delaying the shift of satellite vehicles from concept studies to development work, while proceeding with development of balloons, guided missiles, drone aircraft, and manned aircraft to achieve Air Force reconnaissance needs. This was an important precursor of the BEACON HILL report of June 1952, which recommended Air Force funding for all of the candidate platforms for intercontinental reconnaissance except space satellites. In his July 1951 memorandum, Colonel Leghorn summarized his views of "vehicle possibilities":

1. Earth Satellite

The earth satellite concept does not offer sufficient promise today to justify the expenditure of development funds by the Air Force. This is particularly true in view of the great promise of Project GOPHER. Although the earth's satellite concept justifies limited and continued studies, development work does not appear justified as yet.

2. Project GOPHER

Project GOPHER has perhaps the greatest potential for Pre-"D"-Day Reconnaissance. Because of its extreme importance, maximum

west made quite a bit of noise and Astronomer II looked up to watch it. He then noticed, above the transport and going north, a cluster of five ball-bearing-like objects. They moved rapidly and were not in sight very long. Two years after this sighting, he sighted a single such object which disappeared from sight by accelerating, probably by turning but not by going up quickly. Astronomer II is willing to cooperate but does not wish to have notoriety. Nevertheless, he would furnish further details, and Observer's Questionnaires should be sent to him.

Astronomer JJ has made no sightings himself, but agrees on the policy of reporting to a duly constituted panel if he should see any.

Astronomer KK has made no sightings and was not particularly interested in the problem.

Astronomer LL, Dr. La Paz, has already had so much publicity in *Life* magazine that there appears to be no reason for keeping his name secret. He is the Director of the Institute of Meteoritics at the University of New Mexico, and is cooperative in the extreme. One sighting of his has been described in *Life* magazine and also fully in OSI reports. He has made extensive reports about the green fireball sightings in New Mexico in OSI reports also.

Tombaugh
The discussion of green fireballs with many astronomers disclosed that most of them were of the opinion that these were natural objects. However, close questioning revealed that they knew nothing of the actual sightings, of their frequency or anything much about them, and therefore cannot be taken seriously. This is characteristic of scientists in general when speaking about subjects which are not in their own immediate field of concern. Dr. La Paz has seen only one green fireball himself, but has been avid in collecting reports on the others. Because his full reports are in the OSI files, only the salient points will be discussed here. It appears that the green fireballs can be characterized by being extremely bright, most of them lighting up the sky in the daytime, estimated magnitude -12, which is extremely bright. They appear to come in bunches and at one time 10 were observed in 13 days.

No noise is associated with them despite their brightness. The light appears to be homogeneous, and their light curve resembles a square wave, that is, it comes on abruptly, remains constant while burning, and goes out exceedingly abruptly, as though it is snapped out by a push-button. They leave no trails or trains. As to their color, La Paz is aware of the fact that other meteors have a green color, but he insists that this is a different green, corresponding to the green line in the copper spectrum (5218 Angstrom units). These objects generally move in a preferential north-south, south-north direction.

If these data are correct, that is, if this many objects actually were seen, all extremely bright, all having this particular green color, all exhibiting no noise, all showing a preferential direction, all being homogeneous in light intensity, all snapping out very quickly, and all leaving no trails, then we can say with assurance that these were not astronomical objects. In the first place, any object as bright as this should have been reported from all over the world. This does not mean that any one object could have been seen all over the world, but if the earth in its orbit encountered, for some strange reason, a group of very large meteors, there is no reason that they should all show up in New Mexico. Besides, copper is not a plentiful element in meteors, and the typical fireball goes from dim to bright to very bright to bright and then fades out fairly fast, often breaking into many parts. They frequently leave a trail of smoke in the daytime and of luminescence at night. It is recommended that the OSI reports be obtained, and that the sightings of these fireballs be examined in detail. If the data as reported by La Paz are correct, then we do have a strange phenomena here indeed.

Astronomer MM has not seen any. He happened to be with me, however, while I interviewed some laymen who had seen some aluminum-colored discs. He was most impressed by the consistency of their stories.

Astronomer NN is Clyde Tombaugh, who has already been identified in the *Life* article. He has made two sightings, the first of which is the one reported in

Life magazine and the second was reported to me. The details can be obtained by sending him a questionnaire, as he is willing to cooperate. Briefly, while at Telescope No. 3 at White Sands, he observed an object of -6 magnitude (four times brighter than the planet Venus at its brightest), traveling from the zenith to the southern horizon in about three seconds. The object executed the same maneuvers as the nighttime luminous object which was reported in *Life* magazine. No sound was associated with either of the sightings.

Mr. Tombaugh is in charge of optics design and rocket tracking at White Sands Proving Ground. He said that if he is requested officially, which can be done by a letter to the Commanding General, Flight Determination Laboratory, White Sands Proving Ground, Las Cruces, New Mexico, he will be able to put his telescopes at White Sands at the disposal of the Air Force. He can have observers alerted and ready to take photographs should some object appear. I strongly recommend that this letter be sent.

Astronomer *OO* is a meteor observer at the Harvard Meteor Station in New Mexico. Although relatively new on the job, he observed two lights while on watch at 1:30 a.m. that moved much too fast for a plane and much too slow for a meteor. The two lights were white and moved in a parallel direction. It is recommended that an Observer's Questionnaire be sent to this observer, as his sighting bears a resemblance to the sighting made by Astronomer *R*. It was impossible to obtain full details of those sightings because this would have classed me as an official investigator. The details of these sightings should be obtained by official questionnaires.

A meteorologist at the Lowell Observatory is identified here as observer *PP*. He was not interviewed, but a clipping was obtained from a Flagstaff newspaper covering his observations made on May 27, 1950. The object was observed between 12:15 and 12:20 p.m. on Saturday, May 20, from the grounds of the Lowell Observatory. The object presented a bright visible disc to the naked eye and passed moderately rapidly in front of a fractocumulus cloud in the north-

west. Upon passing in front of the cloud its appearance changed from that of a bright object to a dark object, due to the change in contrast. No engine noise was heard, nor was there any exhaust. It seems that this might have been a weather balloon but in this case it would be strange if this meteorologist would become confused by it. He reports that it was not moving with the wind, but across the wind.

Finally, in this survey of astronomers, my associates and I at the Perkins Observatory should be included. There are six of us there, and to the best of my knowledge, none of us has ever seen any unexplainable object in the skies.

While in Albuquerque, I met, through Dr. La Paz, a Dr. Everton Conger, Instructor in Journalism at the University of New Mexico. On July 27, 1948, between 8:35 and 8:45 a.m. he noticed a disc-shaped object in the sky. It was flat and round like a flat plate. It appeared to be made of duraluminum and gave off reflected light very similar to the light reflected from a highly polished airplane wing. The full details of his sighting are in my notes. I obtained his cooperation and he would be very glad to fill out an official questionnaire.

I also interviewed, while in Albuquerque, Mr. Redman and Mr. Morris, the two gentlemen whose picture appeared in *Life* magazine in the now-famous article on flying saucers. I questioned them separately and found that their stories were remarkably consistent. Indeed, since they viewed the object from widely different parts of the city, there is some possibility that the parallax of the object can be obtained by making theodolite sightings now on where the object appeared to them. The position of the object can be identified now because it was viewed close to a canyon in the mountains. Dr. La Paz has kindly offered to obtain the parallax of this object for us.

Summary and Discussion

Over 40 astronomers were interviewed of which five had made sightings of one sort or another. This is a

not derived from instrument-indications—that the aircraft I was in was not meant to fly.”

(Suppose *something unseen* in the sky had deliberately intended that the airliner should not fly? *Author.*)

Edward Whitney of the Shannon Airport's fire and police force, said he had seen a light flashing in the estuary after the airliner took off in the darkness. The control tower signalled: "Who are you?" but got no reply, although the light kept flashing.

November 30, 1954: Using light beams—not radio or teletype waves—in a test to find if they could get any reply from saucers in space, three Illinois engineers and other observers heard sounds like the ringing of bells, and unintelligible vocables. These messages, whether or not from outer space, seemed machine-keyed, as well as very rapid.

November 30, 1954: The Great Mystery of the alleged two lunar satellites of the earth: U.S. press reports say that the earth has captured two large chunks of meteoric origin, orbiting the earth at 650 to 1,000 kilometers' distance, respectively. But Copenhagen astronomers report nothing even remotely like such satellites. Very unusual circumstances are required for the capture of a new "moon" by the earth; and satellites rotating 621 miles from the earth, would reflect so much light, that even the smallest telescopes would see them.

November 30, 1954: Why the unknown stuff—referred to as "Angels' Hair," or as the Belgian and French call it, "Cheveux de la Sainte Vierge" (Virgin Mary's hair—albeit, why the Lady should be so prodigal of it as to fling it about this planet's airways, I know not!) Is it jettisoned from cigar-shaped, or other saucers to sterilize the air, or render radioactive fall-outs innocuous? Has it any connection with their propulsion in our atmosphere? Who knows?

It is called "spun glass," in Italy, and theorized to be of silicon. Mrs. Dittmar, of Marysville, Ohio, saw a silver cigar-form saucer, emitting an eye-blinding light, discharge it. It drifted to the ground, in long fibers. "It is soft and fine to the touch, but not sticky, and stretches without tearing, although it stains the hands green." It seems to vanish without trace or residue.

November 30, 1954: At 7:55 P.M., Mr. Albert, Mayor of Abbey Wood, on the southeast edge of

London, saw a long, flaming tube with rounded ends, in the sky, hovering, and glowing red. Its trailing edges swelled with white flame, which rose and fell.

(*Author's Comment:* An object like this was seen by me, at Bexleyheath, five miles away from Abbey Wood, at 6:25 A.M., on July 23, 1954. It is likely to be seen again and again.)

Old Father Time, in the closing month of 1954, must have wrinkled his brows and scratched his gray head over still more mysteries, not all of them in the air:

December 1, 1954: The Canadian Minister of Trade, Mr. C. D. Howe, says in London, that the loudly trumpeted hush-hush project of the flying saucer of the Avro airplane firm, Canada, is to be dropped. "Had no useful purpose," says he.

(*Author's Comment:* Then what in heaven, or the other interesting place, was its purpose? For the Canadian tax-payer lost \$155,000,000 on it—not that that will deprive any politician masquerading as a statesman of sleep.

December 2, 1954: Strange thunderstorm over London flooded West End and Trafalgar Square, and southern England. As Mrs. Jeanne Macdonald-Gregory, ex-airwoman who watched it, wrote me: "The sky did not contain the normal heavy electric thunderclouds, but moving layers black in parts. Two falls of hail large as marbles. The one thing that will certainly interest you is that during the whole of this gale-period, the R.A.F. had jet fighters up! Why? I ran into a blank wall of silence.

"I watched no fewer than five jets climbing like mad to their maximum height, the cloudbase, at that period being around 50,000 feet. I saw two of the fighter jets break away and dart off at right angles, as if they had suddenly seen something else in a different quarter.

"No Air Force would send up planes in that sort of weather, if they had not been at panic stations. Was the phenomenon induced by the sixty-three atomic explosions, or by those watching us from outer space? That electric storm made me wonder: Am I crazy to think it was not quite 'natural'?"

(*Author's Comment:* No! Nor is the author of this book crazy. She adds that she is logging all mysterious interruptions to her radio. It is to be noted that

Satellite & messages

Professor Hermann Oberth, well known rocket-missile expert of former Nazi Germany, now in the United States, said in an interview:

"We know of a material that will, in practice, insulate from the pull of gravity any object covered by it."

If that be so, this *may* suggest, perhaps—there is no proof—that the United States has followed Soviet Russia in creating some form of terrestrial flying saucer. But it must *not* be supposed that flying saucers, *in toto*, are merely new and very advanced terrestrial aerofoils. There is, as I have elsewhere stated, far too long a history of unknown flying objects in the skies, going back as far, at least, as Roman annals of the third century B.C., as well as other phenomena that rule out such an extenuation, or annihilation, or "rationalizing away" of the existence of flying objects from worlds outside our own planet.

It may be that German and Russian, and probably American scientists have rediscovered one form of the energies used in ages past, by entities whose science is far older than our own, and who have repeatedly entered our own atmosphere and scanned our earth. There exists a very large corpus of historical evidence proving that this revolutionary statement is not figment of imagination, or anyone's hallucination.

My friend, H. K. Hotham of Melbourne, Victoria, sent me this clipping from the *Melbourne Sun*, dated August 25, 1954:

TWO NEW SATELLITES (NATURAL):

Two meteors had become satellites of the earth and were revolving with it 400 to 600 miles out in space, the latest issue of the American magazine *Aviation Week* said yesterday. The magazine said that the discovery of the satellites threw the air force into confusion this summer.

Alarm over the sightings ended only after they had been identified definitely as natural rather than man-made.

In another place I have drawn attention to a series of mysterious lights and formations on the moon, and in or around lunar craters and plains, seen by astronomers and reputable observers, from the end of the eighteenth century, and many times in the nineteenth and twentieth cen-

turies. Splendid rocket-like discharges have been seen from the moon in times of eclipse. In late September, 1954, a Duluth (Minnesota) newspaper reported that Frank Halstead, curator of the Darling Observatory, said that while he, Halstead, was lecturing in another room, his assistant, using a nine-inch telescope with a sixty power lens, saw what looked like a "lunar road," in the crater Piccolomini (July, 1954). As this can be seen with telescopes of lower power, this may indicate that the "road" is very wide and long. There is no reason to suppose that either the U.S.A. or Russia has built and projected onto the moon any form of terrestrial space vehicle; it would be all but impossible to keep such a tremendous achievement a secret. Therefore, *if* this be an artificial road, one may ask, is it, perhaps, a launching ramp for space vehicles of some other world?

All one can do is scrutinize this crater with a telescope of much greater power.

A correspondent of mine, Miss Josephine Myers, a hospital nurse in Omaha, Nebraska, who owns a lower-power telescope and makes a hobby of selenography, writes me as follows:

"On October 19, 1954, some space-minded friends of mine were very excited at what they called their discovery of something on the moon. I rushed home when my duty-spell was over, and looked at the moon with my telescope of thirty-five-forty power. It looked to me as if there were a big crater, about the right middle side of the moon where I had never seen a crater before. Clouds have since cut off my observation. So I guess I shall have to wait till it's full again, in order to make sure."

No student of the history of science despises the work of amateurs. He or she knows that more than one important discovery has been made or suggested by them. What better advanced base for flying saucers, spying on the earth, than our own moon?