

AMERICAN ASTRONOMERS REPORT

Here are highlights of some papers presented at the 93rd meeting of the American Astronomical Society at Troy, N. Y., in November. Complete abstracts will appear in the *Astronomical Journal*.

Interstellar Grain Formation

In general, the light of more distant stars appears dimmer than that of stars near to us, type for type, and this dimming is attributed to the action of particles of interstellar matter that are about $1/10,000$ millimeter in size, according to classical electromagnetic theory. Although grains of smaller dimensions are expected to be more numerous, they have been thought to make a negligible contribution to interstellar extinction.

Now J. R. Platt and B. Donn, University of Chicago, suggest that quantum processes enable certain much smaller molecules to absorb starlight appreciably in the visible region of the spectrum. They deduce that a mixture of grains with dimensions of only 10 to 50 angstroms (10^{-6} to 5×10^{-6} millimeter) can give continuous extinction in the visible region, decreasing toward the red because the larger particles are less frequent.

Among other favorable characteristics, these small particles would tend to be elongated because of statistical fluctuations in a random growth process involving small numbers. If aligned by such a mechanism as an interstellar magnetic field, they may be expected to produce several per cent of polarization in the starlight passing through them. The polarization of starlight in many regions of the Milky Way galaxy has already been observed, but is only partly explained.

The Chicago scientists believe that the formation of such small interstellar grains may result from their chemical rather than purely physical behavior. They said, "Interstellar matter, consisting primarily of atomic species, must be a highly reactive medium."

At the low densities of the space between the stars, all building-up processes could be caused by two-body collisions. The large hydrogen abundance makes reactions with this element most significant, for instance, between hydrogen and such free radicals as CH, which seems likely to be produced with an appreciable concentration. Collisions among already formed radicals also should be significant, as well as the direct addition of atoms to growing particles. Oxygen, nitrogen, and especially carbon will be important in the building-up process, since only a limited number of hydrogen atoms can be chemically captured by each heavier atom.

This hypothesis differs from previous treatments of the subject in that chemical bonding plays the dominant role throughout the entire development of each grain. The rate of growth will probably be slow.

It is expected that charged, quasi-organic radicals frequently having unsaturated bonds will result from this mechanism. This is just the structure required for the optical properties of interstellar particles.

The Artificial Satellite

"First matter and energy, and now space will have become the slaves of man."

With these prophetic words, Dr. Fred L. Whipple, director of the Smithsonian Astrophysical Observatory, concluded his report on the earth satellite program of the United States government. The Harvard astronomer believes the possibility of making continuous astronomical observations above the earth's atmosphere is of "huge scientific importance."

The sponsor of the American satellite effort is the National Academy of Sciences, working through the U. S. National Committee for the International Geophysical Year, whose chairman is Dr. Joseph Kaplan, University of California. With financial support from the National Science Foundation, the Department of Defense is conducting Project Vanguard, the satellite program, under Navy management. Dr. John P. Hagen, Naval Research Laboratory, is the project leader.

At Troy, Dr. Kaplan announced the membership of the technical panel of scientists responsible for planning the scientific aspects of the satellite. The nine-man panel is headed by R. W. Porter, of General Electric Co., and includes two astronomers, Dr. Whipple and Dr. Lyman Spitzer, Jr., Princeton University Observatory.

Work on the engineering aspects of the project is currently under way, both at the Department of Defense and at the National Academy. Since many of the relevant facts about the satellite and its proposed orbit are undetermined or liable to change, there is still uncertainty about a matter of great interest to astronomers—planning of radio and optical tracking of the satellite. Therefore, Dr. Whipple discussed the visibility of the artificial satellite on the basis of reasonable assumptions. He suggested that the orbit be oriented so the satellite would pass over some fixed astronomical observatories. In this case, transit circle observations might be feasible and permit the accurate measurement of the satellite's position. Precise timing of any positional observations will be of great importance, as the object will travel some 18,000 miles an hour, or 80 meters in $1/100$ second.

The following highlights have been taken from Dr. Whipple's talk:

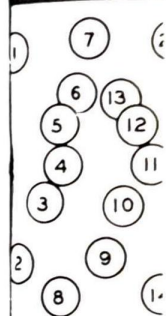
"The satellite will move in an orbit

above the denser lower part of the atmosphere in order that the atmospheric drag will not bring it down too quickly. Perigee distances greater than 200 miles have been mentioned. The period of the object will be about an hour and a half, depending upon the precise values of perigee and apogee after launching. The greater these distances, the longer the satellite will remain in its orbit because of the reduced atmospheric resistance. We may hope that the satellite will remain in its orbit for months or years rather than days, although a complete knowledge of the satellite and its initial orbit would not, at the present moment, give us an indication of its lifetime to an accuracy better than about a factor of 10.

"The apparent brightness will depend upon the satellite's dimensions, albedo, and distance from the observer. Under ideal circumstances of zenithal observation in late evening or early morning twilight, we may postulate, on the basis of published statements, that it may be as bright as visual magnitude 5 to 7, near the limit of naked-eye visibility, but easily observable under ideal atmospheric circumstances by means of binoculars or wide-field optical equipment.

"The satellite's angular motion in the zenith will be of the general order of one degree per second, making the satellite a very rapidly moving object for precise observation by visual techniques and also difficult by photographic or photoelectric techniques not especially adapted for the problem. For example, the limiting photographic magnitude of the Baker super-Schmidt meteor cameras (12-inch aperture, 8-inch focal length) is approximately 6.0 for an object moving one degree per second. The 48-inch Schmidt camera of the Palomar Observatory is theoretically about this fast, but probably will reach somewhat fainter. Thus, only the most rapid large-aperture Schmidt cameras can be immediately suitable for observing the satellite. They will be plagued, in practice, by the brightness of the sky during the intermediate twilight periods when the chances of the satellite crossing will be great. The problem imposed by the twilight sky is perhaps best illustrated by the fact that at a zenithal altitude of 200 miles the satellite would lie on the edge of the earth's shadow at the commonly accepted limit of the twilight period when the sun is 18 degrees below the horizon.

"Special devices for following the motion of the satellite will undoubtedly be of great value in making its photography practical with less extreme equipment. Following may be accomplished in a num-



1 H, 2 F
10 M, 11 N
S, 18 M, 19
20 B, 21
27 S, 28 A
34 M, 35 S
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47 G, 48 I
54 Y, 55 A
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87 C, 88
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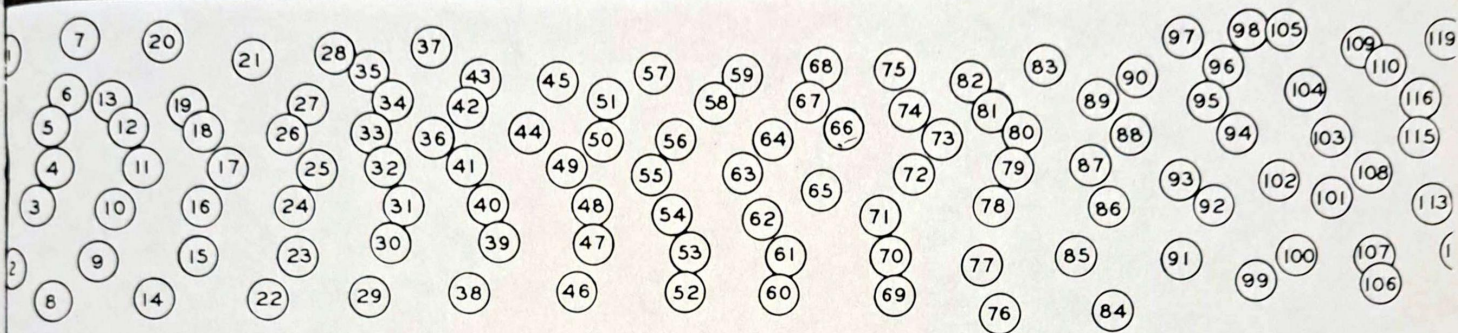
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The American Astronomical Society meeting at Rensselaer Polytechnic Institute, Troy, N. Y., November 10, 1955.

KEY TO PHOTOGRAPH

1 H, 2 F, 3 F, 4 B, 5 L, 6 C, 7 I, 8 D, 9 M, 10 M, 11 M, 12 L, 13 C, 14 D, 15 H, 16 L, 17 S, 18 M, 19 S.

20 B, 21 T, 22 F, 23 L, 24 C, 25 K, 26 M, 27 S, 28 A, 29 H, 30 M, 31 M, 32 W, 33 E, 34 M, 35 S, 36 F, 37 S, 38 M, 39 V.

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60 K, 61 C, 62 B, 63 S, 64 C, 65 S, 66 B, 67 S, 68 H, 69 D, 70 S, 71 U, 72 S, 73 W, 74 L, 75 M, 76 D, 77 S, 78 W, 79 G.

80 S, 81 L, 82 M, 83 S, 84 E, 85 H, 86 W, 87 C, 88 F, 89 V, 90 C, 91 W, 92 S, 93 J, 94 J, 95 D, 96 W, 97 M, 98 D, 99 E.

100 C, 101 H, 102 L, 103 L, 104 K, 105 W, 106 Z, 107 B, 108 R, 109 W, 110 W, 111 G, 112 B, 113 J, 114 R, 115 L, 116 B, 117 P, 118 Z, 119 S.

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Cor, Cornell; H, Harvard; I, Indiana; M, Michigan; OS, Ohio State; Pr, Princeton; RPI, Rensselaer Polytechnic Institute; UA, Upper Air Research Observatory.

ber of ways including optical guiding of the telescope (very difficult), mechanized motion of the telescope according to the theoretical motion of the object, or by motion of the film or plate. Oscillatory motions of the instrument, the emul-

sion, or the light beam may also help.

"Visual observations of the satellite may be useful for acquisition purposes and for measuring the satellite's line of motion across the sky. Visual observations to determine position along the direction

of motion will generally not be very precise, because of its extremely rapid motion and the concomitant severe requirement on time determination. . . .

"Precision of measurement across the line of motion may be considerably

ing book. Somehow, he was forced to repudiate it completely. . . . Like several others who knew Ruppelt well, I have always believed that the enforced retraction and bitter criticism [of his integrity] were partly the cause of his premature death from a heart attack."

After the departure of Ruppelt and others from Blue Book, one thing became very clear, although it was little understood both at the time and even by modern UFO researchers: The CIA, despite their protests, had taken hidden control of the official UFO investigation.

Yet the air force's Blue Book project continued as the visible response of the government. "The Air Force entered upon a long period of unfortunate, amateurish public relations," wrote Hynek, who remained as a consultant. He added, "Some of the Blue Book evaluations of sincere reports were often so transparent and irrelevant that they had later to be retracted." Hynek sensed—or knew but couldn't say—the truth of the situation when he wrote, "Was this all a smoke-screen, a cover-up job for which Project Blue Book was a front, the real work and information being handled by another agency?" Ruppelt stated that an "unpublicized but highly important change took place: another intelligence agency began to take over all field investigations."

The screening of UFO reports began with the 4602nd Air Intelligence Service Squadron, which during another reorganization of Project Blue Book in March 1954 was designated as the group's chief investigators. Only sightings that could not be explained away by the 4602nd would be passed along to the Blue Book offices. Unexplainable reports went to what Ruppelt only called "another intelligence agency." Coral Lorenzen, who would become director of the Aerial Phenomena Research Organization (APRO), had worked at Holloman Air Force Base in New Mexico for several years. She too came to suspect that Blue Book was "nothing more than a public relations front" and "that if a cover-up was in effect, it was being accomplished at CIA level or higher."

Author Peebles explained, "The goal of Blue Book was to lessen public hysteria in order to lower the number of reports and lessen the danger of missing signs of an impending Soviet attack." If this indeed was the goal, it proved to be a dismal failure. In 1962, Edward R. Trapnell, assistant for public relations to the secretary of the air force, was shocked to learn that by that time the rate of UFO sightings was three times higher than in the early days of Project Blue Book.

As the 1960s began, the air force tried several times to rid itself of Project Blue Book. In July 1957, with private UFO groups charging a cover-up, the 4602nd AISS was disbanded and its investigative functions transferred to the 1006th Air Intelligence Service Squadron, which curtailed activities due to limited funding. ATIC first sought to

pass Blue Book to the Air Research and Development Command, but the ARDC declined. The AF Office of Public Information also wanted nothing to do with the headaches connected with UFO investigations. It was even suggested that NASA take over the investigation of UFOs. However, this idea was nipped in the bud when it was pointed out that such a move might convince even more people that aliens and their spaceships were something real. In the end, Blue Book remained within the air force, a quiet office where only the most explainable sightings were sent for filing and public dissemination.

But if the air force was quiet, the entire UFO situation was anything but.

Giant Artificial Satellites

Not only did UFO sightings increase, but stories even stranger than simple lights in the sky began to circulate. One of the earliest of these was reported by Maj. Donald Keyhoe, the leading advocate of the theory that the government and military were hiding the truth.

In his book *Aliens from Space*, Keyhoe flatly stated, "Since 1953, [the air force] had known that giant spaceships were operating near our planet." He said it was during that year that the military began experimenting with new long-range radar equipment. "While making the initial tests," Keyhoe wrote, "AF operators were astonished to pick up a gigantic object orbiting near the equator. Its speed was almost 18,000 miles an hour. Repeated checks showed that the tracking was correct. Some huge unknown object was circling the Earth, 600 miles out." According to Keyhoe, shortly after this object was detected, a second large object came into orbit about four hundred miles out and was also tracked on air force radar.

Keyhoe wrote, "Alarmed Defense Department heads hurriedly set up an emergency satellite-detection project at White Sands, New Mexico. The scientist in charge of this secret search was Dr. Clyde Tombaugh, discoverer of the planet Pluto [and] the only noted astronomer who had admitted sighting a UFO. The 'sky sweep' was a combined armed forces project, under Army Ordnance Research."

A serious look at this preposterous-sounding story yielded a good example of the ambiguity and secretiveness associated with the UFO phenomenon.

Keyhoe's story of the detection of two giant satellites was supported by investigative journalist Warren Smith, who stated that a CIA source told him that huge unidentified satellites were picked up on at least thirteen separate occasions in 1953. Dr. Tombaugh indeed was chosen in 1953 to head a satellite search program encompassing the

world. And he did have a UFO experience about the same time as Kenneth Arnold.

Shortly before 5:00 P.M. on July 10, 1947, Tombaugh, his wife, and his two daughters were driving down a New Mexico highway when he observed a "curious shiny object" hovering in the air. It was a well-defined elliptical object whose surface appeared polished. The object began rising and accelerated through some cloud cover at a speed estimated by Tombaugh at between six hundred and nine hundred miles per hour. The astronomer concluded, "The remarkably sudden ascent convinced me it was an absolutely novel airborne device."

It is most interesting that a scientist with such an experience was selected to head a satellite search program four years before the Soviets put *Sputnik I* into orbit. It is also interesting to note that in March 1954, after word of Tombaugh's secret satellite search project was published in an article in the newsletter of the Astronomical Society of the Pacific, Army Ordnance officials at White Sands issued a press release stating that the military was searching for small "moonlets" similar to asteroids that had come from space and entered orbit around the earth.

This story was picked up by *Time* magazine, which carried the headline "Second Moon?" in its March 15, 1954, edition. According to this article, "Astronomer Clyde Tombaugh, who spotted the planet Pluto (1930), is looking for a nearer and even more elusive object: a second satellite of the Earth. [Army Ordnance] may merely want to know what opposition from nature their rockets are apt to encounter when they climb deep into space. Or they may have a more ambitious interest: a nearby, natural satellite might be a more convenient base in space than the much-discussed artificial satellite." The article said Dr. Tombaugh refused to give any details of his program, referring all questions to Army Ordnance in Washington. This prompted *Time* writers to comment, "It is fair to assume that the famous rocket men who work for Army Ordnance are interested in the project." The article then discussed the possibility of a new satellite, but in a strange, ambiguous manner: "A small satellite close to the Earth would be hard to spot. It might circle near the Equator, invisible to most of the world's observatories. In any case, it would spend nearly half its time in the shadow of the Earth, where it would be invisible."

Speculative as this sounded, the article then prompted its readers to help look for such an object, stating, "Best time to look for a small satellite would be at dawn or dusk, when it would be shining brightly. . . ."

Further notice of this story came in the March 20, 1954, edition

clinging moonlets is being made for the armed forces by Drs. Clyde Tombaugh and Lincoln La Paz, director of the Institute of Meteoritics of the University of New Mexico, Albuquerque, New Mexico." The article quoted Dr. G. M. Clemence, director of the U.S. Naval Observatory, as saying that chances that one or more small satellites exist between the earth and the moon are "very good" but "spotting them will be difficult." "Such tiny objects, which could serve as ready-made space platforms, might have made Earth-splashing meteorites if they had not been captured by our planet's magnetic field," he added. This article also advised the best way to both observe and photograph the new satellites. "Move the camera at the same speed as the satellite being hunted would flash through the sky," it advised.

Were there satellites there or not? The record remained ambiguous. In its October 1955 edition, a writer for *Popular Mechanics* described Tombaugh's small metal shed on the grounds of the Lowell Observatory in Flagstaff, Arizona, where "a close watch will be kept on the satellite that the United States plans to launch in 1957-58." "From this shed," the article continued, "the United States already is maintaining a surveillance of the space that surrounds the Earth, all the way out to the moon. From here, presumably, regular observations are being made of the Earth's first artificial satellite that is rumored to have been launched into space a year ago. Exclusively reported in the May, 1955, issue of *Popular Mechanics*, the existence of this manmade moon has not yet been officially confirmed. But unofficially it is understood that our first artificial satellite is still sweeping around the Earth. The latest information is that its orbit is slowly changing into an ellipse because of the pull of the moon. Possibly the success of this first experiment lies behind the announcement that we will launch an instrument-carrying satellite two years from now, in connection with the International Geophysical Year, to gather new information about outer space."

The May 1955 *Popular Mechanics* had indeed reported that for some time "persistent" reports from "various independent sources" had described a satellite traveling more than sixteen thousand miles per hour at a distance of eight hundred miles out. The magazine noted, "The implication is that this was an experiment which worked too well. A rocket that was expected to return to Earth inside a certain impact area kept on going . . . at an angle and speed that put it into orbit around the Earth."

Popular Mechanics editors stated that Dr. Tombaugh's satellite search equipment was so sensitive "it could detect a white tennis ball 1,000 miles away." Then they presented a most peculiar quote: "Pro-

whether or not any small natural satellites have been discovered. He does say, however, that newspaper reports of 18 months ago announcing the discovery of natural satellites at 400 and 600 miles out are not correct. He adds that there is no connection between the search program and the reports of so-called flying saucers." Since no one but himself had brought up the subject of flying saucers, Tombaugh obviously knew more than he was saying.

Then came an announcement by astronomer John P. Bagby through the Adler Planetarium in Chicago that "tiny moons" had been discovered orbiting the earth at a distance of 475 miles and traveling about eighteen thousand miles per hour. Bagby, a member of the American Meteor Society and the Royal Astronomical Society of Canada, said he had enlisted the aid of several skilled amateur astronomers to help him track the objects. Bagby, like Tombaugh, never hinted that these "moons" might be artificial.

Cpt. Howard T. Orville, head of the President's Weather Control Commission, was asked during a radio interview if he knew of any conditions under which two objects could have naturally entered orbit around the Earth. "No, not that I know," replied Orville. The captain admitted that the circumstances of the orbiting objects was puzzling, but noted that "military security would prevent discussion."

To compound the mystery, a NASA press release in October 1954 stated that the agency had picked up strange signals from an unknown orbiting object. This announcement was corroborated by a French astronomer who claimed to have also detected indecipherable signals from some unknown source in orbit around the earth. Then in 1955, nationally syndicated newspaper columnist Steward Alsop wrote that he had discovered through insiders within government agencies that the satellite detection program actually was looking for artificial satellites. Well into the 1970s, Dr. Tombaugh still had not published the results of his satellite search.

Keyhoe said such large craft had already been sighted prior to the radar contacts in 1953. He claimed that before the CIA took over the UFO investigation, he saw a 1952 report about an air force bomber crew that tracked a formation of UFOs at more than five thousand miles per hour over the Gulf of Mexico. Suddenly another formation of UFOs came up behind the bomber, slowed down, then raced past it. A large ship had suddenly appeared on the bomber's radar, which showed all the smaller UFOs merging with the larger craft. "Evidently this was a prearranged rendezvous for retrieving the smaller-sized units," surmised Keyhoe. "As soon as they were taken aboard, the huge carrier ship accelerated to a speed of over 9,000 miles

Keyhoe even had a theory on what had prompted the sudden outbreak of UFO activity in the late 1940s. In his 1955 book, *The Flying Saucer Conspiracy*, Keyhoe related the story of how Swiss physicist and astronomer Dr. Fritz Zwicky participated in a secret Army Ordnance project to bombard the moon, Mars, and other planets with projectiles launched on V-2 rockets in 1946.

Zwicky, who had been director of research at California's Aerojet Engineering Corporation from 1943 to 1946, reportedly developed a plan to carry scores of projectiles high into the ionosphere, where "shaped charges" would blast them into deep space. It was hoped that when these projectiles struck other space bodies at high velocities it would create a huge nuclear-like explosion that might provide important data on the world's makeup to observing Earth scientists.

"Missiles like that could cause real trouble," surmised Keyhoe. "If they hit an inhabited planet—say, Mars—the people would certainly believe we were trying to attack them. I'd think that if they did it to us." He added that the onslaught of UFO activity may have been to ascertain if the missiles being fired from the earth were meant as aggression. Keyhoe said such tests may have been stopped, but noted that the damage had already been done.

Based on all the evidence, it is apparent that something large was orbiting the earth in 1953. But if anyone within or without government knew for certain what it was, they have yet to go public with this knowledge.

According to Keyhoe, the authorities lost contact with both satellites prior to 1955. But prior to that loss, there was an apparent effort to divert public suspicions by terming the satellites natural objects. An Associated Press story stated, "Pentagon scare over the observance of two previously unobserved satellites orbiting the Earth has dissipated with the identification of the objects as natural, not artificial, satellites. Dr. Lincoln La Paz, expert on extraterrestrial bodies, of the University of New Mexico, headed the identification project. One satellite was orbiting at about 400 miles out, while the other was tracked at 600 miles." La Paz later retracted his statement, probably realizing how foolish the idea that natural satellites could simply arrive and orbit the planet sounded.

Something obviously was going on in the years just preceding the successful launch of the Sputnik satellite—but exactly what? There could have been no secret launch of a U.S. satellite, or we certainly would never have long allowed the Russians to claim the distinction of putting up the world's first satellite. It was not a Russian satellite.

mother ships

could come in from space and somehow find just the right speed and trajectory to enter orbit is dubious at best. Since there were no reports of giant meteors falling to Earth, this leaves only the possibility of giant UFOs that entered orbit, then departed.

Whatever was circling the globe did not fall but left orbit before the launching of *Sputnik I*—an impossibility for any natural object. Even odder was the naïveté of the American public in accepting the military's story that two "moonlets" had suddenly moved into orbit around the earth, then disappeared. It was another example of mind-set overcoming critical thinking.

NICAP Fights Secrecy

By the mid-1950s small groups of UFO enthusiasts were gathering across the United States and calling themselves flying saucer clubs. Most fell to internal bickering and did not last long. One of the most successful—and powerful—was the National Investigations Committee on Aerial Phenomena (NICAP), formed in early 1956 and formally incorporated on October 24.

After initial struggles with inadequate funding and personal squabbles, Maj. Donald E. Keyhoe was elected director. He soon assembled an impressive board of governors, which included former CIA director Hillenkoetter, former Blue Book liaison officer Fournet, Aircraft Owners and Pilots Association president J. B. Hartranft, Canadian Department of Transport engineer Wilbert B. Smith, radio commentator Frank Edwards, and a slew of ranking military officers and scientists.

One of Keyhoe's first moves at tearing down the curtain of UFO secrecy seemed reasonable enough. With the clout of NICAP behind him, Keyhoe sought public congressional hearings on the issue. After all, the much publicized army-McCarthy hearings had recently brought down the demagoguery of anti-Communist senator Joseph McCarthy. Keyhoe and NICAP members felt it was time to clear the air about UFOs. Keyhoe's contact with Senator John McClellan's Senate Subcommittee on Investigations was well received and hearings appeared imminent.

However, in January 1958, after meeting with air force officials, McClellan's subcommittee chief counsel, Donald O'Donnell, advised the group to drop the matter—and they did. Keyhoe commented, "They've given in under pressure, obviously."

Meanwhile, Keyhoe had another experience that convinced him—and many others—that free discussion of UFOs was being muz-

broadcast of the CBS television program *Armstrong Circle Theater*. However, he was required to use a preapproved script. When air force officials objected to Keyhoe reading from government reports, the network cut out the offending statements. Keyhoe cried "censored script," while the network stated it did not want "an open battle with the Air Force." When the show, entitled "UFOs: Enigma of the Skies," was broadcast on January 22, 1958, the frustrated Keyhoe blurted out, "And now I'm going to reveal something that has never been disclosed before. . . . For the last six months, we have been working with a congressional committee investigating official secrecy about UFOs. If all the evidence we have given this committee is made public in open hearings it will absolutely prove that the UFOs are real machines under intelligent control." Before he completed the first sentence, his microphone was turned off. No one in the broadcast audience heard his complete statement. For whatever purpose, it was an obvious move to censor talk about UFOs.

Thwarted in their attempt to initiate hearings before the McClellan subcommittee, Keyhoe and his supporters in NICAP continued to seek an official investigation. Their efforts were rewarded somewhat in February 1958, when a McClellan subcommittee investigator confirmed that the CIA was behind the Robertson panel. This revelation prompted further congressional interest. In June 1958, responding to an inquiry by Ohio representative John E. Henderson, air force officers provided a "special" briefing for congressmen. Whatever was revealed mollified the politicians, who informed the voters that any UFO publicity at that time would be "unwise."

In August, Representative McCormack requested a hearing on UFOs before his House Subcommittee on Atmospheric Phenomena. The weeklong meeting with air force officials was closed to the public and unrecorded. Whatever was said here also "apparently satisfied" the politicians, who discontinued any further hearings. "To close off the possibility that NICAP and Keyhoe might try again," noted author Curtis Peebles, "the Air Force established a new policy in 1959. The policy statement said that the Senate Permanent Subcommittee on Investigations had periodically requested information [on UFOs] and, after preliminary investigation, they indicated that it did not plan to hold hearings."

Keyhoe and NICAP continued to press for public hearings dealing with UFOs, and the air force—which still denied their existence—continued to stall. In 1961, McCormack enlisted the service of Representative Overton Brooks to study UFOs. Brooks, chairman of the House Science and Astronautics Committee, created a Subcom-

war, doing the damage to the enemy deep in his own territory . . . If the Army had been adequately supplied with ammunition . . . it would consume more of the enemy, the enemy supplies, create problems for him, which, in turn, would help our air service."

Q "I am against extending this war . . . to any greater sphere of land mass of Asia, like Manchuria . . ." The U.S. should "confine our fighting to Korea, if possible, but with a victory, military victory."

Maginot Line of the Air

In more than 150 U.S. newspapers last week, Columnists Joseph and Stewart Alsop offered their readers an intimate portrait of Dwight Eisenhower unable to sleep at night as he wrestled with a problem which might end in "the physical and final destruction of this republic." Ike's sleeplessness, according to the Alsops, was caused by worry as to whether his Administration should adopt the recommendations of Project Lincoln, a study of U.S. air defenses carried out at Massachusetts Institute of Technology at the request of the armed services.

Though the Project Lincoln report was classified "secret," the Alsops devoted a series of three columns to an analysis of its conclusions. The M.I.T. scientists, they said, had decided that within two years the U.S.S.R. would be able to deliver an atomic attack "large enough to cripple or even devastate this country . . ." At present, the Alsops went on, U.S. defenses against such an attack were so inadequate that they "really amount to no air defense at all." To remedy this situation, the nation must follow the Project Lincoln blueprint: "An early-warning net must be thrown around the almost inaccessible northern fringes of the hemisphere . . . All the parts [of the warning net] must automatically guide the defenders to the

attackers . . . Fighter air bases and guided-missile launching sites must be arranged in echelons, from the air frontier to the American industrial heartland." The estimated cost of such a program, said the Alsops, was \$16 billion to \$20 billion.

When other reporters began to check the Alsops' story, however, the implication that Project Lincoln was the Government's prime concern collapsed like a pricked balloon. At a presidential press conference, Dwight Eisenhower quietly remarked that he had never studied the report in detail. Other Administration spokesmen made it clear that Project Lincoln is only one of several air-defense studies, none of which is now under active consideration.

The fact was that, even if the U.S. had an extra \$20 billion to spend, most U.S. strategists would want to use the money to buy bombers rather than for a more elaborate air-warning and air-defense system. No matter how much money is spent, a complete defense of the U.S. against atomic attack cannot be constructed, and the best way to deal with the threat, according to most military men, is to be ready to hurt the enemy more than he can hurt the U.S. "A Maginot Line on the ground is bad enough," said one Air Force officer last week. "There isn't any line you can hold in the air."

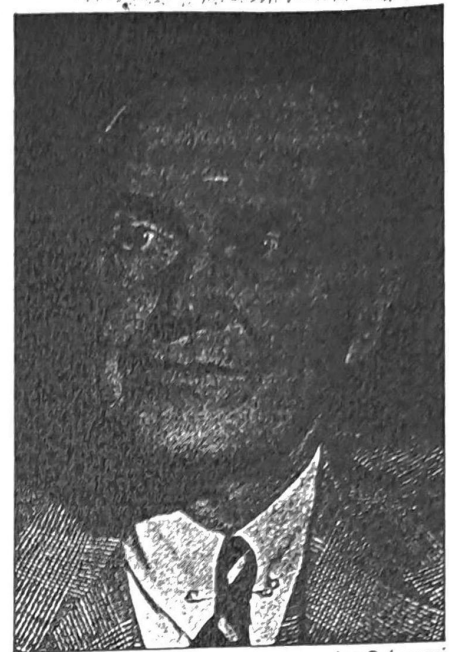
APPOINTMENTS

Old & New Faces

Nominated or appointed last week to posts in the Eisenhower Administration: Q To be Assistant Secretary of State for Far Eastern Affairs: Walter S. (for Spencer) Robertson, 59, first-family Virginia investment banker and sometime China hand. A Democrat (who liked Ike in '52), Robertson went to work for the Government during World War II, served as chief of the Lend-Lease mission to Australia, then as embassy counselor and chargé d'affaires in China's wartime capital, Chungking. In 1946 he headed the truce enforcement commission set up by the Marshall mission. After Marshall's makeshift appeasement failed, Robertson quit the foreign service, went back to banking with the conviction that the Chinese Communists were "ruthless Marxians," and that the U.S. had "sold China down the river."

Q To be Governor of Guam: Ford Q. (for Quint) Elvidge, 60, Seattle lawyer. When Interior Secretary Douglas McKay asked him whether he would accept the governorship, Elvidge protested that he was not ready to "retire to a South Sea island and sit under a palm tree"; he agreed to take the job only after McKay assured him that it was "a tough assignment." What makes it tough is that the Navy and the civilian administrators are waging a cold war to decide who is going to run the island.

Q To be Commissioner of Public Roads: Francis V. (for Victor) du Pont, 58, financier, Republican National Committee-



Joe Colognori

WALTER ROBERTSON
Fed up with appeasement.

man. A member of the chemical clan (his father was T. Coleman du Pont), Du Pont served for 27 years (23 as chairman) in Delaware's State Highway Department, is given major credit for the state's A-1 road system.

POLITICAL NOTES

For President?

The presidential bug is no respecter of political party, reason or season. Last week, some three years before the next national political convention, Washington's political medicine men thought the bug had bitten these fellow townsmen:

Tennessee's Estes Kefauver, 49, who ran stronger than any other Democrat in the presidential primaries last year, never has stopped running, never has seen fit to kill off the spreading legend that Kefauver could have beaten Eisenhower.

Texas' Lyndon Johnson, 44, who last year drained the last ounce of publicity out of his thoroughgoing, watchdog committee on military affairs, as Senate minority leader in the 83rd Congress now shows a rare talent for keeping Northern Fair Dealers and Southern Democrats working harmoniously on his team.

Missouri's Stuart Symington, 41, Harry Truman's energetic Secretary of the Air Force, who won the Democratic nomination to the Senate last summer over Truman and Pendergast opposition, then won the election while Stevenson lost to Ike, now is speaking out plainly for a strong U.S. defense policy. Symington has even picked his 1956 opponent: Joe McCarthy.

California's William F. Knowland, 44, who used California's power in the 1952 G.O.P. Convention to strengthen his own position with GOPoliticos, has since deftly gained complete control of federal patronage in California. In the Senate he has made his mark as a champion of a



Walter Bennett

JOSEPH ALSOP
Worried by insomnia.

officials. This is the notion that a reporter cannot possibly reach the same rather obvious conclusions that government officials have reached unless the reporter has had illicit access to secret information. This delusion is even more widespread in Lyndon Johnson's Washington than in Truman's, Eisenhower's, or Kennedy's.

Our Truman era investigation occurred a few months after the Soviets exploded their first atomic bomb in September, 1949. This first atomic blast blew Secretary of Defense Louis Johnson's economy-in-defense policy halfway out of the water (the Korean aggression, in June, 1950, blew it entirely out of the water). Johnson and a couple of his cohorts on Capitol Hill were passing the word that the Soviet test was a fake, that it was not a true nuclear explosion at all.

When Senator Owen Brewster in a public speech echoed this nonsense, it occurred to us that there might be a column in the answer to the question, "How do we know that the Soviet test is not a fake?" My brother and I tried this question on several government sources, but we drew a blank—the subject was "sensitive," they said, and they clammed up. Then I had a bright idea. I called Georgetown University, asked for the head of the physics department (whom I had never laid eyes on), and asked him our question. He gave the answers which would be obvious to anyone with a working knowledge of nuclear physics: split nuclei in air samples, seismographic confirmation, and so on.

We published a column on the subject, which must have seemed very dull and technical to our readers. Unfortunately, the same question which had occurred to us had also occurred to President Truman. A paper had been prepared for him, and, as we learned later, it precisely paralleled the paper we had written—since physicists have a special language of their own, some phrases were actually identical.

Truman instantly concluded that we had purloined his Top Secret document, and he ordered the FBI into action. The FBI, finding no evidence of a government leak (there was, of course, no evidence to be found), adopted at last the desperate and unusual expedient of sending a couple of agents around to ask us how we got the story. The agents had obviously been carefully chosen—they were polite and intelligent young men, and one of them was even capable of discussing my brother's French furniture rather knowledgeably. But we did not tell them about the physics professor, and they left convinced, no doubt, that we had some still-open pipeline into the "secret places of the most high."

The episode in the Eisenhower era was even sillier. For some months, immediately after Eisenhower's re-election, and before the launching of the first Soviet Sputnik in 1957, a dispute raged within the Eisenhower administration about the U.S. missile effort. There was ample intelligence, based largely on a football-field-sized radar installation in Turkey, that the Soviets were testing very powerful missiles, capable of putting a satellite in orbit. The late Trevor Gardner, an Assistant Secretary of the Air Force, and one of the rather meager number of first-rate public servants of the Eisenhower era, was the chief protagonist of the view, strongly resisted in George Humphrey's Treasury Department, that a really major and expensive U.S. effort had to be made to match the Soviet effort.

I shared Gardner's view, and one day I dropped by the Pentagon to try out on him an idea I had for a column. (Most columnists pretest their column ideas in this way.) I had drafted a piece in which I quoted two wholly imaginary newspaper headlines: "SOVIETS CLAIM SUCCESSFUL LAUNCHING OF EARTH SATELLITES" and "U.S. RADAR CONFIRMS EXISTENCE OF EARTH SATELLITES." The idea was to suggest how disastrous to U.S. prestige it might be if the Soviets were the

first to orbit the earth. Gardner liked the idea—more than I realized at the time.

My brother was abroad, and some days later, when the flow of columns from him ceased, I filed the column with the imaginary headlines. My brother arrived home the day after the column was published. A homecoming weekend had been planned for him at the country house of the late Frank Wisner, then a Deputy Director of the CIA. Richard Bissell, also of the CIA, was to be another guest. Wisner and Bissell were close personal friends, and we never discussed their business with them. But on orders from on high, the homecoming weekend was canceled—it subsequently became known as “the lost weekend.” The reason, we learned much later, was that the President had been so enraged by the column with the imaginary headlines that he had ordered “an investigation to end all investigations.”

Trevor Gardner, it transpired, had liked my imaginary headlines so much that he had incorporated them, virtually without change, in a National Security Council paper arguing the case for a greatly increased U.S. missile effort. The President read the column and the NSC paper on the same day.

“Goddammit,” he was later quoted to us. “I don’t like the Alsop brothers reporting what’s in my NSC papers *after* I see them, but I’m damned if they can get away with quoting from my NSC papers *before* I see them.” It never occurred to him that the Alsops weren’t plagiarizing from the NSC—that the NSC was plagiarizing from the Alsops.

As these ridiculous episodes suggest, tension between the press and the President is no new thing under the sun. Even in the administration of John F. Kennedy, who genuinely liked reporters, the tension rose steadily and inexorably. Kennedy’s cancellation of his subscription to the *New York Herald Tribune*, one of the few really silly things he ever did, was an expression of the profound irritation, the sense of

being treated with gross unfairness, which all Presidents, from George Washington on, have felt toward the press, and with considerable reason.

As everybody knows by now, the tension between Lyndon B. Johnson and the press breaks all previous records. This is partly because Lyndon Johnson’s conception of what is properly secret goes far beyond that of his predecessors.

All the postwar Presidents have used the “Secret” stamp to conceal the inconvenient—to conceal, for example, information that would tend to throw doubt on the wisdom of the defense or foreign policies of the administration in power. But, at least in theory, the national security provided the *rationale* for government secrecy. There is no serious pretense that the secrecy which President Johnson imposes—or tries to impose—on the government is necessarily related to the national security.

Any accurate forecast of anything the President intends to do—an appointment he intends to make, a trip he is planning to take—throws the President into a rage. He will go to almost any lengths simply to prove the forecast inaccurate. Many trips have been canceled, and a dozen or more major government appointments rescinded, for the sole purpose of proving the reporters who predicted them wrong.

A case in point was a story Philip Potter of the *Baltimore Sun* wrote for his paper in 1965 about the prospects for aid to India. Potter accurately forecast the amount of aid the President intended to ask Congress to provide. The amount was generous, the need desperate, the story involved no conceivable consideration of national security, and it put the President in a good light. Moreover, Philip Potter, a reporter of rocklike integrity, was one of Lyndon Johnson’s few real remaining friends in the press corps. Despite all this, the President was so angry that he quite seriously considered canceling the whole Indian aid program, or at the least

to his own particular personal and political style, whatever may be written into law or shown on the organization charts.

Moreover, the life and death of the NSC perfectly exemplify the curious blooming-and-withering process which goes on constantly within the Washington bureaucracy. A new agency or organization will become bureaucratically and journalistically fashionable, blooming luxuriantly, putting out shoots in the form of subagencies and subordinate committees and committees-within-committees. It will then begin to die of its own weight, withering away into near-nothingness. But because government organisms, like old soldiers, never die, it will continue to exist indefinitely, in theory and on paper, wholly shorn of its former glory, a bureaucratic ghost.

The whole process recalls the brief existence of Solomon Grundy:

Born on a Monday,
Christened on Tuesday,
Married on Wednesday,
Took ill on Thursday,
Worse on Friday,
Died on Saturday,
Buried on Sunday.
This is the end
Of Solomon Grundy.

The National Security Council was born in 1947, flourished until 1952, took ill with bureaucratic elephantiasis in 1952-60, got worse in 1960-62, died in 1963-68, but remains unburied.

The NSC was chiefly the brain child of the first Secretary of Defense, James Forrestal. Its mission, as defined by Congress in the National Security Act of 1947, was to "advise the President" on all matters "relating to national security."

Since every foreign policy decision above the level of how to decorate the consul's living room in Ougadougou relates to national security, this put the NSC right at the top of the bureaucratic heap. This was as Forrestal intended. He wanted foreign and defense policy to be made in an orderly, sensible way, for already in 1947 the tendency of each department and agency of the U.S. Government to have its own private foreign policy was becoming evident. Forrestal also wanted to make sure that the Defense Department and the military men had at least as decisive a say in major foreign policy decisions as the State Department and its professional Foreign Service Officers.

Thus in its original form the NSC was heavily weighted in favor of the Pentagon. The Secretary of State was a statutory member, so designated by Congress, but he was greatly outnumbered by denizens of the Defense Department—the Secretary of Defense and the Secretaries of each of the three services were statutory members of the NSC, while the Joint Chiefs of Staff were given access to the President as "advisers." Another Congressionally designated member of the NSC was the Chairman of the National Security Resources Board, a postwar collateral descendant of the War Resources Board.

In 1949 the balance was righted somewhat when Congress amended the National Security Act, and eliminated the three service Secretaries. That left the Secretary of State and the Secretary of Defense as coequal members of the NSC. And this in turn automatically made the NSC the supreme arbiter of policy, beneath the President himself. For as Bromley Smith, a self-effacing but highly perceptive long-time Secretary of the NSC, has said: "The relationship between State and Defense—that's the guts of the power equation in Washington. Everything else is subsidiary."

But, rather oddly, the Chairman of the NSRB also re-

mained a statutory member of the NSC, in theory coequal with the Secretaries of State and Defense, as his bureaucratic descendant does to this day. As will be seen, this is one reason why "the nation's highest policy-making body" is no longer the nation's highest policy-making body.

That is what it was in the Truman era. Except for a rather brief period of semiparalysis, when Secretary of State Dean Acheson and Secretary of Defense Louis Johnson were scarcely on speaking terms, the NSC functioned remarkably well as the essential instrument of decision-making. There was one area—Israel, with its sensitive domestic political implications—which Truman ruled out of bounds for the NSC. Otherwise, all the great key decisions of the Truman era, so remarkably productive in retrospect, were debated and shaped in the NSC. The Berlin blockade (the NSC's baptism of fire), the H-Bomb, the Korean War, and the NATO alliance were probably the four most important issues with which the NSC was "seized" in that period.

The NSC also produced in the Truman era the basic policy paper which for many years formed—and still forms in part—the philosophical basis of American foreign and defense policy. This was the famous "NSC-68"—the sixty-eighth NSC paper to be approved by President Truman. NSC-68 was the joint product of Acheson and Paul Nitze, currently Deputy Secretary of Defense, then chief of the State Department's Policy Planning Staff (immensely influential at the time, now still another bureaucratic vermiform appendix). NSC-68 called for a great and costly American effort to create Western "positions of strength" in order to right the world-power balance with the then monolithic Communist bloc. It was during this period also that the basic structure of the Western alliance, which remained intact until Charles de Gaulle wrecked it more than a decade later, was put together.

There were several reasons why the National Security Council was in those days so effective an instrument of decision-making. President Truman firmly kept the NSC in its place. Forrestal had originally planned to put the staff and the conference room in the Pentagon, but Truman would have none of this; room was found for the staff in the Executive Office Building next to the White House, and the meetings took place in the Cabinet Room. Truman also made it abundantly clear that the function of the NSC was strictly to "advise." The responsibility for final decision was his and his alone. "The buck stops here," read the plaque on his desk.

Even so, Truman believed strongly in the NSC and used it regularly. "I don't know how all the other Presidents got on without the NSC," he remarked toward the end of his Presidency.

In those days, moreover, a lot of very able men were involved in the making of foreign policy. After the Korean aggression proved Louis Johnson's policy of unilateral disarmament in the name of economy disastrously wrong, Johnson was fired, and Acheson worked well together with Robert Lovett, who replaced Johnson as Secretary of Defense. Aside from Acheson and Lovett, Truman benefited from the brilliant talents of such men as Forrestal, George Marshall, John McCloy, Averell Harriman, George Kennan, Charles Bohlen, Paul Nitze, and Richard Bissell. Never since—not even in the Kennedy era—have so many men of superlative ability advised the President on foreign and defense policy.

There was another reason as well why the NSC in those days worked well: the fact that its Executive Secretary was a now forgotten Missourian called Sidney Souers. Souers, a pleasant, very shrewd man with an anonymous sort of face and a wispy mustache, was very close to Truman, whom he

in many ways resembled, and whom he briefed every morning on the affairs of the world and the NSC. He was that *rara avis*, a perfect staff man, uninterested in building empires or making decisions of high policy, but capable of seeing that the necessary decisions were made, and made intelligently.

Souers grasped the essential fact about a mechanism like the NSC, the fact that the more it expands the less useful it becomes. In the early fifties he returned to work after a brief absence to find that Truman had virtually ceased to go to NSC meetings, because more and more people were attending the meetings. There were twenty-nine people in attendance on one recent occasion, the President complained—the NSC had become “nothing but a town meeting.”

Souers persuaded the President to issue an order limiting the attendance to “the top guys only”—the heads of agencies and departments invited to attend, and no one else. “Unless you keep just the top guys who really make policy,” Souers told Truman, “the thing will fall apart.” Truman issued the order, and the NSC ceased to be “nothing but a town meeting.”

During the eight Eisenhower years, the NSC bloomed luxuriantly, and it was also during those years that it began to die of bureaucratic elephantiasis. President Eisenhower, like Truman, was a believer in staff systems, but his kind of staff was the top-heavy kind produced by the U.S. Army, whose staff system is the most elaborate and the most overpopulated of any army's in the world.

The NSC in the Eisenhower years became a sort of American Politburo, to be whispered about with awe. This was partly because the President used the NSC machinery in arriving at virtually all major policy decisions, so that the NSC really was “the nation's highest policy-making body.” It was also during this period that the cult of secrecy-for-the-sake-of-secrecy reached its finest flower. The secrecy cult

was fostered particularly by Robert Cutler, Executive Secretary of the NSC. Cutler, an amiable Bostonian, adored Eisenhower and also adored secrecy the way small boys do. Secrecy combined with real power exerts a magnetic attraction on the bureaucracy, and attendance at NSC meetings became the essential status symbol for the rising bureaucrat.

At some meetings in the late Eisenhower period, as many as sixty officials from a dozen agencies would be stuffed like ambitious sardines into the Cabinet Room of the White House. Inevitably, the NSC spawned offshoots in the form of parallel interdepartmental committees, down into the lower reaches of the bureaucracy. The two most important of these offshoots were the Planning Board, which was supposed to draft decisions for NSC approval, and the Operations Coordinating Board, which was supposed to “implement” the decisions of the NSC, once they were taken.

Thus the NSC apparatus grew—and grew. The Souers rule—“the top guys only”—was long forgotten. When President Kennedy inherited the NSC machinery, Eisenhower version, he was appalled by what seemed to him a monstrosously cumbersome way of arriving at decisions. The overpopulation of the NSC meetings was a continual irritant.

“What does that fellow come to NSC meetings for?” he would ask of some middle-level bureaucrat who attended all the meetings but never opened his mouth. Curiously, Kennedy never fully understood the magnetic attraction which surrounds the Presidency like the “divinity that doth hedge a king”; or the crucial importance to a rising bureaucrat of being able to remark casually to his envious lesser colleagues: “As the President said at the NSC meeting last Thursday . . .”

Kennedy dispensed with the Planning Board and the Operations Coordinating Board, and he installed in Souers' old job McGeorge Bundy, a brilliant and aggressive man who

From: DRudiak@aol.com
Date: Sun, 19 May 2002 02:29:38 EDT
To: presidentialufo@canada.com
Subject: Re: Project Magnet - Canadian and U.S. (FYIO)

Here are a few more interesting abstracts from the Journal
of Space Flight
that I missed the first time through. Most interesting
from the 1954

Sun

NEWS

SPORTS

FINANCE

ENTERTAINMENT

HEALTH

TECHNOLOGY

TRAVEL

BUSINESS CENTRE

CLASSIFIEDS

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From: DRudiak@aol.com
Date: Sun, 19 May 2002 02:29:38 EDT
To: presidentialufo@canada.com
Subject: Re: Project Magnet - Canadian and U.S. (FYIO)

Here are a few more interesting abstracts from the Journal of Space Flight that I missed the first time through. Most interesting from the 1954 satellites aspect is abstract # 2435, an article by British amateur astronomer (and a notorious UFO debunker) Patrick Moore, where, after a review of the data, he dismisses the likelihood of Earth having more than one moon. What's most interesting is the date -- July 1954, a month before the story broke in Aviation Week.

Coincidence? We think not!

I'm going to look up the article, since the UC Berkeley library carries the journal. It's great living near a large university library that carries such esoteric journals.

Abstract #2395 is about the May 1955 Mechanics Illustrated article about the U.S. having secretly launched a satellite. Abstract 2440 is a summary of the Feb. 1954 LaPaz article (but no mention of Tombaugh's search for satellites).

David

March 1955 v. 7:3
2319. "Martin Team Pushes AntiGravity Study" Stone, Aviation Week Oct. 18
1954 p. 42. The Glenn Martin Company has set up an advanced design group of 130 men to study basic forces of interest to the company. Emphasis includes study of antigravity devices, space ships, satellite stations, nuclear energy, and rocket ballistics. The department is expected to expand to 200. In the field of antigravity, clues to effective devices are in sight using field theory as a guide to tying electromagnetic forces to gravity. A new classified approach is also under study. WAP.

Sept. 1955 v. 7:7
2395. "A Satellite for the Stars and Stripes?" Aeroplane, AVC, May 20, 1955.
A press release from Popular Mechanics indicated that America may have accidentally established the first satellite rocket, through a mal-firing of

a multistage major rocket. The altitude claimed is 800 miles; the time, early 1955. The rocket is said to be still in space. Aeroplane feels this report should not be dismissed lightly, as technical development indicates we are not far from achieving such an event. the Redstone and the Atlas come close to permitting satellite velocities. Aeroplane states that both the USA and the USSR will probably establish space stations at closely similar times. The Russians have set up a master committee to coordinate and direct all work on solving the problem of mastering cosmic space. Peter Kapitza is a member of the committee. WAP

2402. "The Confidence Trick" J. Alsop, Chicago Sun Times Aug. 22, 1955. The American government is stated to be hiding the facts of Russian guided missile progress behind security wraps, and is accused of conducting token programs in guided missile fields to satisfy public fears without spending money. The earth satellite program is cited as an example, and the government is accused of deciding to build a small basketball satellite to fictitiously demonstrate American superiority over Russian progress, when as a fact, the Soviets are building a militarily much more significant satellite and plan to announce this soon. Alsop claims that the Russians a year ago built a new rocket motor, the M102, which yields a thrust of 132 tons, and that this motor powers the first stage of a two stage 1500 mile missile. The entire American long range missile program is stated to comprise a USAF brigadier general with 100 persons and clerks, plus the staff of Ramo-Woolridge corporation. WAP.

Oct. 1955 v. 7:8

2435. "Has the Earth a Second Moon?" Patrick Moore. J. Brit. Inter. Soc. July 1954. A discussion of data, early and more recent, on the possibility that the earth has another satellite. He concludes that we have "only one satellite worthy of the title". NJB

2440. "Advances of the Perigees of Earth-Satellites Predicted by General Relativity" LaPaz. Pub. Astronomical Soc. Pacific. 66 13. (March 1954) A mathematical investigation of the problem. The lunar perigee is too small to provide a check on the general theory of relativity. However satellites moving about the earth at mean distances small in comparison to the mean distance of the moon would give an opportunity for a good

DOES EARTH HAVE MANY TINY MOONS?

Myriad Dull Spheres, One Foot to 100 Feet in Diameter, Thought to Be Circling Globe

BY WILLIAM S. BARTON

Myriad dull spheres ranging in size from one foot to more than 100 feet in diameter are believed to be forever circling the earth outside the atmosphere at altitudes between 10,000 and 240,000 miles (the distance of the moon).

Existence of these dark objects is suspected by some scientists, including civilian researchers for the United States Army Ordnance Corps. A systematic search for the tiny moons has been started at Lowell Observatory, Flagstaff, Ariz., by Clyde Tombaugh, discoverer of the planet Pluto.

At 55 S Grand Ave., Pasadena, West Coast headquarters for the corps to which we look for our present and future weapons, you may learn about several basic research projects undertaken primarily to increase the Army's store of knowledge. The greatest of all new weapons, including the A-bomb, resulted from this indirect approach.

Projects Explained

Dr. James Edson, part of whose duties include supervision of ordnance basic research in nine States, explained the Lowell Observatory and other projects.

Tombaugh is searching the skies for these heretofore never-seen objects with the aid of a special 8-inch Schmidt telescope. You could say that he has initiated the first space patrol for the Army between the earth and the moon.

He has a tough job. Because, for one thing, these small dull hypothetical objects, traveling so close to the earth, are expected to make blurs on photographic plates. To find them, the astronomer must divide the distance between earth and moon into a series of shells. One of his first tasks is to calculate the velocity of objects which haven't been seen. It's something like tracking invisible bugs, but techniques employed by artillery to track enemy planes may be helpful.

Mile a Second

Speeds of the supposed objects are estimated at more than a mile a second. An arbitrary table indicates that the 8-inch Schmidt should just be able to see a 100-foot-in-diameter sphere at the distance of the moon. It also should photograph a 42-foot-in-diameter object at an altitude of 100,000 miles and a 50-

inch-in-diameter object at a height of 10,000 miles.

The small Schmidt telescope would photograph a V-2 rocket at an altitude of 25,000 miles. The great Schmidt telescope on Palomar would photograph one of these rockets at the distance of the moon.

Dr. Edson says that any of these objects found at a distance of 26,390 miles above the center of the earth would duplicate the earth's rotational speed of around 1000 miles an hour. Thus, such an object might hover indefinitely over a particular part of the earth.

Exciting Event

"If Tombaugh," he asserted, "finds even one of these objects, it will be exciting. We shall immediately alert all observatories to try to calculate the object's orbit. Indirectly, at least, this project should help the Ordnance Corps.

"The effort should help in increasing the efficiency of our guided missiles and help in the search techniques for enemy missiles. But it also should supply some new data regarding the origin of the solar system and the probable cost of establishing stations in space."

An artificial meteor project, supported by the Ordnance Corps, is under way at the University of Utah. It is directed by Dr. M. E. Van Valkenburg. Made of aluminum slugs, the artificial meteors take off and leave tracks consisting of shock waves. The meteors are white hot, but the shock waves

are being studied with radar. The slugs travel at two miles a second and their activity makes interesting comparisons with natural meteors possible.

Image Can Be Distorted

In one of the Ordnance-sponsored basic research tests, radar is bounced between rough ground and clouds of charged particles in the ionosphere at altitudes of 30 and more miles. The results have proved interesting because they shed light on how these clouds may distort the image of a guided missile as seen by radar.

Research done for Ordnance by Dr. Otto Struve, University of California astronomer, has necessitated the revision of the theory of turbulence in the atmosphere. His observations and study of fuzzy spectra suggest they are caused by explosions in the atmosphere of stars. The fact that some of the turbulence gyrates at speeds faster than sound may prove of value in designing supersonic jet missiles. Most of the explosions, Dr. Struve thinks, result from atomic disturbances in the stars.

One of the other basic projects Dr. Edson can talk about is the fixation problem being studied by Dr. Irving Maltzman, a UCLA psychologist. Fixation of interest to too great an extent makes certain persons inept for certain critical jobs.

For example, some airplane

pilots may fix their attention so hard on a target that they become hypnotized and fail to pull the plane out of the way of another aircraft. Drivers of automobiles may become so hypnotized by a long straight stretch of highway that they fail to see traffic about to cross the road.

A similar fixation problem may interfere with creative work. A talented man may build up a great store of knowledge in his head, but fail to realize that this store of information has put him in a cage. Again, a football quarterback may get a fixation on running through the line and forget to take advantage of a great passing opportunity.

'Cosmic Clock' Fed

"The crank," Dr. Edson says, "has no censor. But the highly trained man may need a censor to encourage relaxation."

One of the Ordnance researchers at UCLA has a bottle of liquid which gives off flashes of light. He feeds this liquid into a "cosmic clock."

This clock measures the time between flashes of cosmic ray particles. The time between flashes turns out to be a tenth of 1,000,000,000th of a second. This shows how long mesons, nuclear particles which compose some cosmic rays, live.

Despite their brief lives, mesons, thought to be the "glue" that holds matter together, may portray a new picture of the universe through such experiments.

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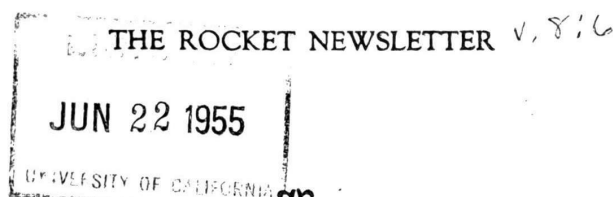
NUMBER 6

The Orbit Lifetimes Of The Two New Earth Satellites Part 2
Harold Ketchum

Rocket Abstracts

Norman Bowman

Book Reviews



Editor Harold Ketchum
Business Manager Norman Bowman

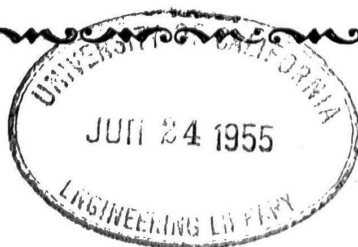
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THE ORBIT LIFETIMES OF THE TWO NEW EARTH SATELLITES Part II (Numerical Considerations) by H.B. Ketchum

The previous article in this journal developed the major analytical considerations involved in attempting to estimate the orbit lifetimes of the two new satellites of earth that have supposedly been discovered (1). This article will consider the data and method used to arrive at a numerical result. The previously derived expression for resistance under superaerodynamic flow conditions is:

$$F = Kv \quad K = -(\pi/8) [1 + (2R/\lambda)] \rho_{\text{eff}} A' \bar{c} \quad \text{for } \lambda > 10R$$

$$K = -(\pi/8) (1/0.81) \rho_{\text{eff}} A' \bar{c} \quad \text{for } 10R \geq \lambda \geq R$$

where v is the velocity of the object, cm/sec.

ρ_{eff} is the effective density of the medium, gm/cm³.

R is the radius of the object, cm.

λ is the mean free path of the medium particles, cm.

$\bar{c}$ is the average velocity of the medium particles, cm/sec.

A' is the projected area of the object, cm².

F is the frictional force, gm.cm./sec².

This expression shows that the following atmospheric properties are important: ρ_{eff} , $\bar{c}$, λ . Values of these properties of the atmosphere were not available at the altitudes required, so an atmospheric model was obtained by extrapolation of available data at lower altitudes (2). Table I gives the values obtained of these properties at various altitudes.

Values of pressure are fairly well known up to about 400 km. All the available pressure data was plotted on semilog paper (log p in mm. Hg vs altitude in km.). A best line through this data was then extrapolated as a smooth curve from 400 km. to 1000 km. using a single point available at this extreme altitude. Pressure values from this curve were used to evaluate ρ_{eff} using the following equation:

$$\rho_{\text{eff}} = 1.6125 \times 10^{-6} p (\text{M.W.}/28.98)$$

where p is the pressure in mm. Hg and M.W. is the molecular weight. (ρ was used in the previous article instead of ρ_{eff} , but the latter is probably a better designation for this quantity hence it is used in this article). ρ_{eff} values can also be obtained by the summation equation:

$$\rho_{\text{eff}} = Nm' = \sum_{i=1}^a N_i m_i'$$

where N_i is the number of particles of the i th kind and m_i' is the

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v 5:6

Report On An Interview Concerning The Observation Of
a Strange Aerial Phenomena

H B Ketchum

The following is a report of an interview and represents the author's reporting of the facts. The Chicago Rocket Society publishes this previously unlisted information as a matter of general interest.

This interview has to do with the sighting of a glowing object on September 22, 1953 at 9:50 PM. Dr. R.T. VanStrien, a chemist, was driving home on Route 73 toward Griffith Indiana, 0.75 miles south of Route 6, when a glowing, moving object was seen in the sky to the Southeast. (SE). This object appeared to be circular and had a cold greenish glow that was fairly bright. There were no clouds in the sky and a full moon was shining, so that it could not have been a searchlight beam reflection. The object was moving along a course of flight that appeared to be at an angle of 45° with the ground and it was estimated to be about a mile away. The object disappeared behind a clump of trees in the distance as if it had landed. Dr Van Strien got out of his car and listened for the sound of an airplane, because the thought crossed his mind that this was a dropped flare. However, he heard no airplane engine. He made an attempt to get closer to the place where the object disappeared from sight by following some back roads, but his search revealed nothing. The size of the object was estimated to be about that of a small airplane.

Reports have been made on previous occasions of sightings of greenish glowing objects in the sky in this general area. Dr Van Strien's report is accepted as authentic because of the author's personal knowledge of the man as a technically trained scientist given to accurate reporting. The significance of the observation is emphasized by the efforts made by Dr Van Strien to get a close up observation.

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BOOK REVIEWS

Wayne Proell

AIRCRAFT PROPULSION: Theory and Performance A W Morley
(and A Beston)

The growth of astronautics has reached the point where the pertinence of many related sciences is increasingly realized. In the last five years, aerodynamics has become of interest.- In spite of space being airless, space ships must traverse the atmosphere. This thin band of atmosphere, it is now known, can be used to the great advantage of spaceships, in takeoffs, fuel conservation, and in gliding braking.

"Aircraft Propulsion" is valuable to space flight because it is a fine textbook to educate people with the theory of high speed air flow. Although aircraft motors themselves are not directly useful to spaceships, the principles behind their operation are vital. In addition, two of the aircraft motors described, rockets and ramjets, can be used on spaceships.

Report Of An Interview Concerning The Observation Of A Strange Flying
Craft
by
H.B.Ketchum

It should be made clear from the start that this article is the report of a personal interview and does not necessarily express the opinion of the Chicago Rocket Society. The interview was made to confirm a report that the author received by chance from a member of the Civilian Saucer Investigation Committee. This article is published for general interest and represents strictly the authors transmittal of the information obtained in the interview and from a newspaper article concerning the subject.

In February 1953, several newspapers in the Carolinas published stories concerning the sighting of a strange flying craft by a country store operator in South Carolina. On a recent trip to the southern U.S., the author obtained a copy of one of the newspaper articles and from the information contained therein was able to contact personally the man who had experienced the "observation". After talking with the man for better than an hour and asking many questions, to more clearly pin down details not adequately covered in the newspaper article, the following story and description of the craft was obtained.

Mr. Lloyd Booth, a country store operator, resides about eight miles north of Conway, S.C. on Route 4. On the night of January 29, 1953 he closed his store at about 11PM and went home for a late supper as was his usual practice. While sitting in his kitchen waiting for the coffee to heat, one of his two mules stabled by itself in the barnyard became very excited and started raising a commotion. This particular mule was very exciteable by nature, so Mr. Booth ignored this as due to some common cause such as a car going along the highway in front of his house. However when his second mule and his fowls also joined in the commotion, he thought he had better investigate. Since the death of a few healthy livestock had occurred in the vicinity recently, with no apparent cause, the suspicion that mischievous intruders might be about prompted Mr. Booth to get his .22 calibre pistol and go out to take a look. After investigating his barnyard and not finding a prowler, he went further out to the back where the one exciteable mule was stabled. As he crept around the stable, he was startled to see a strange craft proceeding at a very slow rate just over the tops of the trees in a wooded area that bounds the back of his barnyard. Realizing that he was seeing something closely akin to a flying saucer, he hollered to his house in efforts to wake his parents. He was over 200 yards from the house by now, and had no success however. When he could waken no one, he decided to get a closer look and ran into the woods in pursuit of the craft.

Since the object was proceedign at a very slow rate, he was able to catch up with it. He was also able to get ahead of it and out to both sides and so examine it from all angles except of course from the top. There was a full moon that night and in fact an eclipse had occurred earlier in the evening. At the time he was following the craft it was about mid-night, and the countryside was lit up in a manner as similar to daylight as it ever gets on a fair night with a full moon. He followed it for from 20 to 30 minutes and all the while it preceeded about ten feet above the tree tops at the rate of a very slow walk.

After seeing all that he thought that he could, he shot at it with his pistol and heard the bullet ricochet off of what sounded like metal. He fired again, but simultaneous with the first shot the craft had taken off at an angle of about 65° at an incredible speed, and he missed. It continued at this angle until it was out of sight in a short period of time.

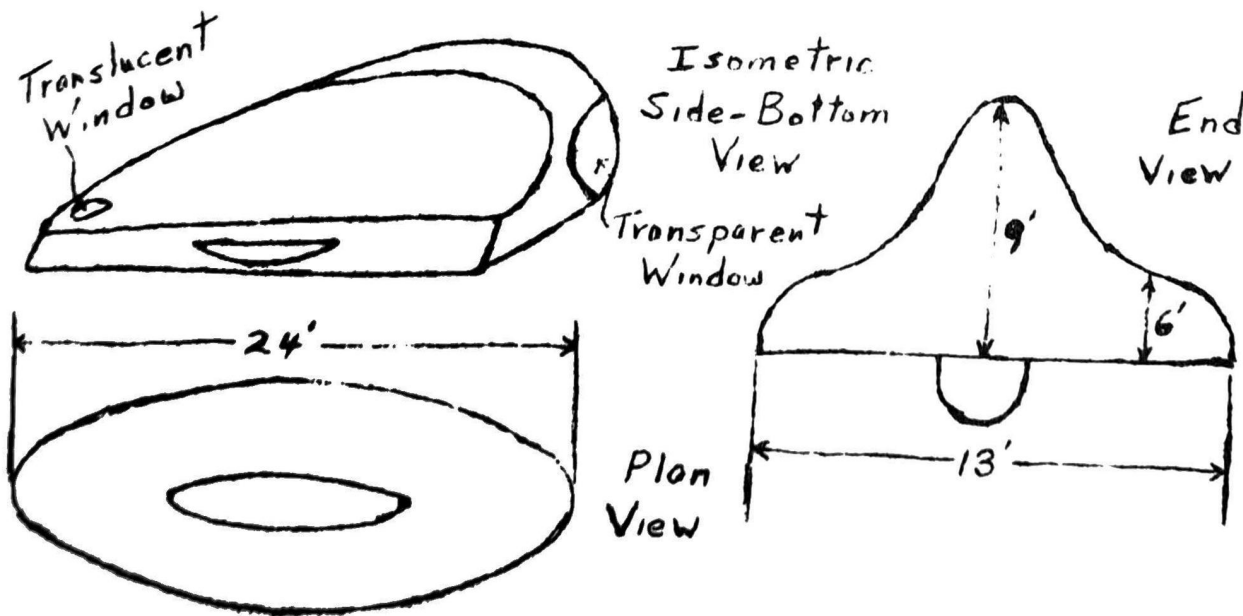
Mr. Booth being well aware of hoaxes that had been perpetrated about flying saucers in the news decided not to mention his experience. The shots he fired had awakened his parents, however, and he told them about it in answer to their questions about the shooting. About a week later he mentioned it to a lifelong friend and neighbor and from there it got into the newspapers. Mr. Booth's word is not usually questioned nor was it in this case by those who knew him well. He had nothing to gain from a hoax and he made no effort to get his story into print as evidenced by the fact that he casually mentioned it to his friend a full week later and from there was prodded into the whole story. The incident has been accepted by a vast majority of the people in his area as authentic with no explanation of what the craft was. Mr. Booth was in an anti-aircraft outfit during the war and is familiar with all types of aircraft - helicopters, blimps, jets, and aircraft with which most people are familiar. He said that it was none of these types nor did it even slightly resemble any of them. This craft had a shape the likes of which he had never seen before.

This then is the story. In the interview an attempt was made to pin down every detail imaginable concerning its shape, construction, etc. Specific questions were asked to this end and the result was the following description with the sketch that Mr. Booth drew to better illustrate the craft's strange shape. The shape is difficult to describe in words. It was roughly 24 ft. long, 12 to 14 ft. across, and 8 to 10 ft. high. The ship was large enough to be manned by humans. It had a shape almost like a half of an egg cut end to end except that the front of it came up at about a 60° angle and the back at about a 40° angle. It was flat on the bottom and blended in all around on top in a highly streamlined manner. No rivets or welded seams were discernable. The hull looked exactly like oxidized aluminum. The closest he got to it was when he was directly underneath it. It was about ten feet above the top of tall pine trees, so he estimates it to have been 70 to 75 feet over his head. There was a clear transparent window in the front and two translucent windows like smoked glass, one on each side, in the back. These windows were molded in line with the hull. White light issued from these windows with an intensity comparable to the light of a 100 watt bulb streaming from the windows of a car. The light was not directed like a searchlight beam but simply shone through the windows into the night.

Nothing was discernable inside the ship through the clear window in the front because of his position below it. The little that could be seen from this angle looked like the inside of a cockpit. He saw nothing moving inside. No marks of identification of any kind were found, although he searched for these in particular. Underneath the object was an opening that looked to be about three feet across and there was a crescent shaped something protruding that looked like about a third of a large wheel. This was taken to be a retractable landing gear but he had never seen one like it before. There were no

guiding surfaces and no visible means of support or propulsion. It had no propeller and no exhaust tube or vapor trail as from a jet or rocket was visible. No unusual odor was detectable and there was no glow around the hull. A humming noise however was barely audible coming from it. The noise sounded like an electric motor or generator. When he shot at the craft and it departed, the humming noise became much louder and sounded about like a 125 HP generator when the load is applied. When it departed, it did so much faster than any aircraft he had ever seen before and went completely out of sight at the same angle from which it started in about 3 minutes. He felt no tug on the metal gun in his hand when the humming noise increased, as might have been suspected had a strong electromagnetic field been present. The ship did not spin about any axis as some flying saucers have been reported as doing.

Mr. Booth has been interviewed by Army intelligence. There is nothing about that section of the country that this craft might have been interested in such as ore deposits, government installations, etc. Incidentally, it was determined later by autopsy that the livestock had been killed by lead poisoning. The source of the poison is unknown but it is not believed to be connected with the strange craft. Mr. Booth has received mail from all over the U.S. with inquiries about the ship and he said that he has answered everyone. He is very interested as to what he saw and is seeking information concerning other possible sightings. There is no doubt in his mind about the ship he saw and he is conscientious and straight forward about his experience. He talked freely about it and answered all the questions asked with deliberateness. It is to be noted that on February 11, a red lighted mystery craft was sighted and chased by a Marine jet over the North Carolina coastal area. Also mysterious flying lights had been sighted at Marion, S.C. by at least six persons over a three hour period on February 13. These two incidents were also written up in the newspapers. It is the authors opinion, based upon Mr. Booth's personality and the manner in which the story was told and questions answered, that this is not a hoax. It appears that the man did see a strange craft of a design totally unfamiliar and with an unknown but powerful means of propulsion.



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THE NEED FOR CRITICAL ANALYSIS OF FLYING DISC REPORTS

An Editorial by N. J. Bowman

The authors interest in flying saucers plus the current rash of books on the subject has led to the present editorial. The possible existence of flying saucers is a matter of considerable importance to everyone. Our government says catagorically that they are not responsible for them. In such a case they must either belong to a foreign government or be interplanetary --- if they exist.

The general subject has fallen into disrepute because of the highly sensationalized books that have appeared on the subject and because scientists of reputation have stated that they are natural phenomenon.

We have then the two extremes. The first group which takes a few questionable facts and embroiders them into something that will sell books but which has little meaning in the evaluation of an important phenomena. The other group takes a few observations and with scientific principles explains them away. Both of these points of view appear equally wrong to the writer. One might with justice ask "why has no one applied the scientific method taught to every beginning science student to the problem?" Those scientists who have written on the subject are particularly vulnerable to this criticism because they should know better.

It is known that the government has several thousands of flying saucer reports which it has investigated. Other civilian groups have done the same thing in so far as they were able. This represents a considerable mass of data which might, with proper analysis, lead to definite conclusions. What is first needed is an evaluation of the probable reliability of the reporter. It is obvious that an observation such as La Paz, the astronomer, or Commander McLaughlin have made, are worth many times as much as one that John Doe handyman, who did not go beyond the 8th grade, would make. That does not mean that John Doe is wrong, - it simply means that he is more likely to have been misled.

So taking our mass of data, we do several things with it. we attempt to grade reports in order of probable reliability into three or four classes. We then further catalogue them as to what was seen - size, shape, speed, distance, propulsion, conditions of observation, etc. With the data broken down this far, certain important things may already appear. Geographical distribution should lead to interesting correlations.

To this date we apply statistical analysis to sort the data, indicate what is probably unreliable, determine averages, deviations, etc. We can do this for various classes of reliability and for the entire mass of data.

I do not pretend to know what the data will show - possibly nothing. However that may be, this is the only way the problem can be approached to yield conclusions of significance. It would appear that a sufficient body of data is available to make such a statistically critical analysis possible.

Why does not somebody do it? Possibly because only three groups, to the authors knowledge, have enough data. Two of these may not be sufficiently trained to do the job, the other group - the armed services - begins to look more and more like it has an ax to grind or a face to save. It is to be hoped that the people who have the data either do the analysis in the proper manner or publish the data so others can do it. The problem is of such importance that its resolution deserves the most suitable scientific attack possible.

FLYING SAUCERS FROM OUTER SPACE

By Major Donald Keyhoe. John Hold, 1953. 275 pages, \$ 3.00.

This is Major Keyhoe's second volume on the subject of flying saucers. He has made a study of the phenomenon for some years and is by far the best of the writers on the subject. Having said this much to his credit, it is unfortunately necessary to continue in a less friendly vein.

Keyhoe scattered throughout the book has a considerable body of data on flying saucer sightings, and this phase of the book is of considerable interest and value to those interested. However he makes little attempt at critical evaluation of the sightings and appears in general far too ready to accept any report at face value. His general approach to the problem seems wrong also. The book gives the impression that Keyhoe long ago decided that the flying saucers are from another planet and has carefully selected his data to prove the point.

Both popular and scientific viewpoints on flying saucers are tending so much toward the skeptical that this volume will hardly win converts because of its lack of critical evaluation and an objective approach. Particularly damaging are the final several chapters of out and out speculation as to where the saucers may originate and why the interplanetary voyagers are so carefully surveying the earth.

This book is of interest to the serious investigator of saucer reports because it contains data that is not readily available elsewhere. It is also probably the best book yet written on the subject. It is unfortunately written in a manner designed more to sell books than to convince readers that the saucers are real. NJB

FLYING SAUCERS HAVE LANDED

Leslie and Adamski. British Book Center. 1953. \$ 3.50.

This volume is one of several which have done much to make both scientist and layman laugh at flying saucers as a hoax. It reads like a science fiction story. The authors have seen saucers land, have talked with the operators of them, have secret documents in undecipherable languages, have photographs taken through a telescope showing details of construction and so on for hundreds of pages. This all is unpleasantly reminiscent of the little men from Mars, three feet high, who landed in Mexico.

One of the most interesting and certainly valuable features of this book is a six page reproduction of the Flying Saucer Review which had been unknown to the reviewer. This is a mimeographed running abstract of flying saucer reports which have come to the attention of the authors of the Review. This seems like a most interesting publication.

The authors of this volume may be telling the truth and the objects of unjust criticism on the part of a number of reviewers. In a way I hope they are right as I would like to see space flight a reality. For the time being I join Keyhoe in being skeptical of the "data" presented in this book. NJB

THE JOURNAL OF SPACE FLIGHT

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The following article is the resume of a talk on flying saucers given before the Dec. 24th, 1953 meeting of the Chicago Rocket Society. The author, Mr. Otto, has spent much time investigating this subject. This article represents Mr. Otto's opinion and does not necessarily connote official CRS opinion. It is published here as a matter of general interest and in conformance with the policy of the CRS to publish either side of a controversial subject such as this, in the hope of stimulating discussion and perhaps thereby of eventually arriving at the truth.

SPACE VISITORS

by

John Otto

In this controversial subject I am not going to summarize and dwell on the past sightings -- There have been many books written which do an excellent summarization as gleaned from tons of newspaper clippings, recordings of interviews, etc., and I leave it up to each and every individual to go over the reports and in some cases, the following up of individual people who have had experiences, so that they may form their own conclusive proofs and determine what the whole thing portends.

Due to the overwhelming nature of these visits and some of the ridiculous statements made by our authorities, a general attitude of INCREDIBLE AND UNBELIEVABLE has obscured much of what could have been learned these past six years since Ken Arnold first sighted what he said LOOKED LIKE DISCS OR FLYING SAUCERS.

Let there be no mistake about it, we are being visited from an

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Flying Saucers

O.L. Jagers

The Saucers Speak

G.H. Williamson

*These books have been also published in pocket editions.
There are several more books unlisted at present.

Research groups - some with bulletins and regular meeting periods.

Flying Saucer International Max Miller P.O. #34 Preuss Station
Los Angeles, Cal.

Aerial Phenomena Research Coral Lorenzen Sturgeon Bay, Wisc.

C. S. I. Los Angeles, Cal.

Flying Saucer Investigative Soc. St. George, Del.

I.F.S.B. New Haven, Conn.

Frank Edwards (Radio Newscaster AFL) 11PM Washington, D.C.

There are a number of foreign and domestic groups that are not listed at present.

B.S.R.A. Leade Layne 3524 Adams Ave. San Diego, Cal. is one of the oldest research organizations in the field and has much valuable information.

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THE JOURNAL OF SPACE FLIGHT

extraterrestrial source by intelligences far beyond the human concept and they, the visitors, are living amongst us now unknown to the masses. We are having contacts made with various individuals throughout the globe with no preference made as to race, religion, or creed. In these contacts, our visitors welcome every question we ask them and some of the answers to these questions are startling to say the least. They state that they have no medical science problems on their planets -- illness as we experience it is native to man and his earthly way of life. There are vehicles in use on their planets that need no roads as they glide over the surface (utilizing forces of propulsion as yet not understood by man). When asked about the life span of these visitors, they state that their span is well over a thousand years (with smiles upon their faces they quickly state that they of course do not record time as men does).

It is understood that the several people who have had the nerve to write and tell of their experiences with our visitors are under severe criticism and a target of all who desire similar experiences or who cannot through sheer stupidity reason that there could be possibly any other living thing resembling man and his supposed supreme intelligence any where in our galaxy much less the universe. These contactees write and tell of their experiences with a full knowledge that they are being scathingly reviewed and one must remember that for every one that speaks of his contact and knowledge, there are a hundred that do not breathe a word. Each and every one of us will have a contact and a knowledge of what is happening eventually and I know there are many such as I that want to know now rather than wait for centuries to know what is transpiring.

The question is asked often, why, if our visitors are here do they not contact us openly and make themselves and their purpose known to all. They are doing just that but one must put themselves in the position of say ourselves - acquiring space travel and coming upon a lesser stage of development than our own on another planet, could we land, walk up to a stone age type man and say hello!! In the very fear of the unknown, the primitive man would strike out in self defense before he had understood our complex language for he would have only one knowledge, that of himself and nothing else would exist for him. Man of earth is in that state today with reference to the degree of advancement of our present visitors.

Our visitors are not going to give us on the veritable silver platter the complete mechanical and scientific knowledge they hold, for first, we could not understand it and secondly, those of us that could would be in a position to carry our warlike problems to other sources or habitations in the universe. Due to the stimulation of the research of new and radical possibilities, plus what captured vehicles we do have, several of the earthly powers are constructing what can be termed FLYING SAUCERS. These vehicles are mentioned widely in the press and when an accomplished flyable vehicle is made, we will all hear via the press and engineering circles that these are the space ships we have all heard about for so long.

The next important question now that they are here, where are they from must be answered through the reports of some of us who have had the pleasure and good fortune to have been contacted and in the case of George Adamski, his visitors inferred that they had come from or just recently arrived from Venus. In another case, the visitors claimed to have come from a planet called "CLARION" which is not known to us by any other name and is construed to mean that we have not

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charted and recorded this body to date. Still others have stated that Jupiter and Mars are involved and after much research it appears evident that man is being visited by not one but a great number of beings in varying degrees of knowledge and states of development from all over the universe, and that contrary to former conjectures, the universe teems with life of every description and is not solely native to earth.

Their reasons for being here at this time in such great quantities has been answered somewhat by the reports that the whole galaxy is in a shifting and change process and the unstable conditions of earth are being accentuated by some of mans new discoveries and experiments and these can be detrimental to the precise balance of our galaxy and resultant balances to all other habitable planets -- they are here to assist and help in such physical corrections that are necessary and to help man without involving themselves in mans present problems.

What can each of us do to help -- We can, every one of us, read and evaluate everything that is written or spoken on the subject and RELATED subjects. Evaluate and reason everything out each in his own mind and in his own way. In the objective research of this tremendous new happening on earth, we have got to construct new measuring devices and uncover new means of evaluation for we are dealing with a new dimension and a three dimensional yardstick is not qualified to measure these completely new things that are happening. We must remember that Archimedes' mathematics and geometry were the parlor tricks of 15 centuries ago and only a very few were capable of using these discoveries for solving practical problems of the day. We of today have parlor tricks that will be the sciences of tomorrow and it is up to man to unlock those rusty hinges of knowledge and examine the practical uses of such parlor tricks that are being investigated and (DISBELIEVED) by such universities as Duke and Stanford.

Granted a tenure of this planet for our future, we as men are coming into a new age -- an age that is full of the greatest surprises in the form of accomplishments spiritually, physically and scientifically. Dogmatic forms of reasoning are going to give away to an unfolding -- an opening up of mans mind that makes for the greatest adventure of all time.

In closing, I say that there will be no one man nor one work that will tell the complete story of our SPACE VISITORS. Each in his own way will have his own experiences that will unfold into the general knowledge and we will all accept the visitation as a commonplace thing as time moves on. In the general research, we must not consider the vehicle (FLYING SAUCER) as the important issue. We must try to understand and in friendliness, meet with our visitors and try to understand their message to us. The excitement and interest we have to examine the vehicle and pore over the mechanical developments must be suppressed for the time by understanding more of the visitor and all other interest will uncover gradually.

The following is a list of published material and flying saucer research groups that might be used in study:-

Behind The Flying Saucers
The Coming Of The Flying Saucers
Is Another World Watching
The Flying Saucers Are Real
Flying Saucers From Outer Space
Flying Saucers Have Landed

*Frank Scully
Ken Arnold & Ray Palmer
*Gerald Heard
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D.E. Keyhoe
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THE JOURNAL OF SPACE FLIGHT

THE CASE FOR THE UFO

M.K. Jessup

Reviewed by H.B. Ketchum

The Citadel Press

While the controversy over UFO's (Unidentified Flying Objects) is still an unsettled question, at least in the minds of the inquisitive and uninhibited, the subject has apparently ceased to be of news-worthy value for the newspapers. This situation may have come about through censorship or from the fact that so many sightings have been and continue to be reported that it no longer is news. Books continue to be published on the subject however, and the majority of these are definitely pro-UFO in attitude. Very little material has been published relatively that is averse to the subject or the possibilities. The relationship of UFO's to astronautics is almost obvious.

The book "The Case For The UFO" is an attempt to prove the existence of these objects to the fullest extent that observational evidence will allow. While many books in this field cite page after page of sightings, this one has relatively little of this. It depends more upon deductive arguments based upon correlation of material from many fields. The three main fields that have been culled for information relating to UFO's are meteorology, history, and astronomy. The author, M.K. Jessup, has been trained in astronomy and archeology and is thus well versed in the subject matter employed to build up a case for the existence of UFO's.

The author arrives at some startling deductions from the examination and correlation of direct observational, indirect observational, and supporting evidence and indications. One such deduction is that the UFO's do not necessarily originate outside the earth-moon binary system - one place of origin is pinpointed by use of astronomical data. Other conclusions reached are similar to those obtained by contemporaries who have written on the subject. The author has made a serious attempt to pull all the facets of this controversy into a basic stratum so that an intelligent evaluation can be made. Needless to say, he does not agree with the scientists who insist that all of these things are mirages, weather balloons, illusions, etc. Reading the book requires an open mind and a desire to think when the occasion demands. The reader is asked to admit of certain possibilities based upon deductive reasoning that are unorthodox with respect to present scientific tenets. Thus each reader will have to make up his own mind as to whether he accepts or rejects the possibilities and conclusions. An introduction by Frank Edwards, radio commentator, sets the stage.

The book is printed in easily legible type on fair quality paper. The binding is adequate for a book of this type. There is no index.

RECOMMENDATIONS::: Recommended for purchase by anyone interested in the UFO controversy. Even those who scoff should at least see the other side of the story, and this book presents the pro side quite well.

The Case For The UFO

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M.K. Jessup

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ADVANCES OF THE PERIGEEES OF EARTH-SATELLITES PREDICTED BY GENERAL RELATIVITY

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J. J. Gilvarry has suggested¹ the possibility of checking the advance of perihelion predicted by the general theory of relativity by observations on the motion of minor planets of high eccentricity. Examination of the orbital elements of the minor planets leads Gilvarry to the conclusions that while Icarus (1566) provides the most favorable test object by a wide margin, and while an observational check on the advance of perihelion for this particular asteroid is possible, "... decades of astronomical observation may be necessary to measure the perihelion advance with sufficient precision."

Since the statement just quoted seems amply justified and since additional checks on what is probably the least ambiguous of the crucial tests so far proposed for the theory of relativity are needed,² one is led to look for test objects providing peri-primary advances of greater magnitude than those predicted for Icarus. Since the advance, v (in radians per century), is inversely proportional to $(1 - e^2)a^{3/2}$, where e and a are, respectively, the eccentricity and the semi-major axis of the test object's orbit, it is natural to think of utilizing planetary satellites moving at mean distances quite small in comparison with the semi-major axes of the orbits of planets; and, indeed, De Sitter chose our moon as a test object as long ago as 1916.³ Although he was primarily concerned with determining the modifications of the moon's orbit resulting from the *combined* attraction of the earth and the sun under Einstein's new law of gravitation, it was found that the modification imposed by Einstein's law on the gravitational field of the earth alone resulted in an advance of the lunar perigee of 0".06 per century,⁴ an amount far too small to be detected.

It is our purpose to point out that while the advance of the lunar perigee is too small to provide an observational check on the validity of general relativity, the same would not be true of the perigeal advances of satellites moving about the earth at

mean distances small in comparison with the mean distance of the moon.

That satellites of this sort may exist is strongly suggested by several independent lines of argument. Furthermore, until extended systematic searches with properly designed equipment have been made at observatories not too far from the equator, failure to discover such bodies can have little significance.* Irrespective of whether or not satellites may be discovered at small mean distances from the earth, the present state of satellite-vehicle research certainly justifies the belief that in the not distant future, artificial satellites can be set in motion in prescribed orbits about the earth. By the proper choice of such orbits and by proper design of the satellite-vehicles, exceedingly satisfactory test objects for the purpose of verifying the perigee advances predicted by general relativity might become available.

CALCULATION OF THE PERIGEE ADVANCE FOR AN EARTH-SATELLITE

We shall use Levi-Civita's remarkable "Theorem of Mechanical Equivalence"⁸ for the motion of an infinitesimal body in the Einstein gravitational field of a single central mass, a theorem which for our purpose may be stated in the following form:

The trajectories with respect to the earth of an Einsteinian satellitory motion of total energy E coincide up to the second order of approximation with those of a Newtonian motion in ordinary Euclidean space for which the total energy is also E and the force, U , is derived from the potential function

$$(1) \quad U = \frac{fM}{r} \left[1 + 4 \frac{E}{c^2} \right] + \frac{3}{c^2} \left[\frac{fM}{r} \right]^2.$$

Here c is the velocity of light, f is the gravitational constant, M is the mass of the earth, and r is the distance from the earth to the satellite measured as if the space between the two were Euclidean.

* Clyde Tombaugh has just informed me that U.S. Army Ordnance Research has agreed to sponsor a search for near-by satellites of the earth with especially designed photographic equipment.



Following the reasoning by which Levi-Civita derived his formula for the relativity advance of the perihelion of a planet moving about the sun,⁶ we find that the perigeal advance $\sigma(t)$ in seconds of arc per period of revolution t for a satellite m , moving at mean distance r in an orbit about the earth of eccentricity e , is given by

$$(2) \quad \sigma(t) = \frac{4.519 \times 10^{-5}}{1 - e^2} \times \frac{r_0}{r},$$

where $r_0 = 38.43 \times 10^9$ cm is the mean distance of the moon from the earth. The factor $(1 - e^2)$ does not occur in the denominator of Levi-Civita's analogous formula because he takes $e^2 = 0$ for the planets, an approximation not always legitimate for the earth-satellites which we shall consider here.

In this problem we shall find it convenient to use the symbol σ , defined as the total advance of the perigee of m per century. To compute σ we first determine the periodic time t of m in years from the rigorous form of Kepler's harmonic law. The quantity σ is then given by

$$(3) \quad \sigma = 100 \sigma(t)/t.$$

In terms of σ we can define for each satellite a *figure of merit*

$$(4) \quad \alpha = k l \eta \sigma,$$

in which, for purposes of comparison with results obtained in Gilvarry's paper, the factors, k , l , and η are taken to have the same significance as he gives them.⁷

THE PERIGEAL ADVANCES OF EARTH-SATELLITES

Several of the planets in the solar system have small satellites moving at a mean distance of approximately $1.33D$, where D is the diameter of the planet. Because analogous, tiny subsidiary moons may be circulating about the earth, we shall choose as the first test objects two bodies moving about our globe at mean distances of 1.7×10^9 cm in orbits of eccentricity 0.06 (about that of our moon) and 0.40 (about that of J VIII), respectively.

As a third test object, we shall consider an artificial satellite

moving at a mean distance of 0.72×10^9 cm in an orbit of eccentricity 0.02. This is the sort of moon considered by L. Spitzer, Jr., in a most interesting paper dealing with the perturbations of a small body revolving in a nearly circular orbit around the earth at a height of approximately 800 km above its surface.⁸

Finally, as the fourth test object, we shall consider a satellite-vehicle that has been maneuvered into an elliptical orbit for which $r = 1.0 \times 10^9$ cm and $e = 0.25$.

In Table I the first column contains the designation of the

TABLE I

Test Object	σ	$\eta\sigma$	k	l	a
$m(1)$	146"0	8"8	≥ 3	0.1	$\geq 2''64$
$m(2)$	194.6	101.1	≥ 3	0.1	≥ 30.1
$m(3)$	1250.5	25.0	≥ 3	1.0	≥ 75.0
$m(4)$	586.6	161.6	≥ 3	1.0	≥ 484.8
Mercury	43.03	9.4	1/3	1.0	3.1
Icarus	10.05	46.6	≥ 3	0.1	≥ 14.0
Hermes	2.62	1.8	—	0	0
Apollo	2.10	2.1	—	0	0
Adonis	1.80	5.7	—	0	0

various objects; the second, σ , the perigee advance in seconds of arc per century; the third, the products $\eta\sigma$; the fourth and fifth, the values assigned to the parameters k and l ; and the last column, the computed values of the centennial figure of merit. Figures of merit for intervals other than a century can be easily computed from a since they are proportional to the length of the interval. The entries in the lower half of Table I for Mercury, Icarus, Hermes, Apollo, and Adonis have been extracted from Gilvarry's tabulation of centennial advances and figures of merit.⁹

The choice $k \geq 3$ for each of the four test objects is justified since the three reasons (a), (b), (c) advanced by Gilvarry¹⁰ for the same choice in the case of Icarus hold with even greater force for these four objects. In fact, the adoption of a k -value appropriate to Icarus would seem to distinctly favor the asteroid as compared with near-by earth-satellites.

Assignment of the value one-tenth to the parameter l for the

first two test objects is predicated on the assumption that such bodies if once discovered would thereafter present the same observational difficulties as those encountered in observing Icarus.

The choice $l = 1$ for artificial satellites is justified because the proper design will provide whatever degree of detectability is necessary in order to ensure that $\langle n/P \rangle$, as defined by Gilvarry, is equal to unity.

To summarize, it is believed that the figures of merit in Table I, in view of the k and l values on the basis of which they were computed, represent conservative *lower bounds*. Nevertheless, the *annual* figure of merit for $m(4)$ would exceed the centennial figure of merit for Mercury and is more than one-third of the centennial figure for Icarus. Furthermore, the *decennial* figures of merit for $m(2)$ and $m(3)$ would equal or exceed the centennial figure for Mercury, while the *decennial* figure for $m(4)$ is three and a half times the centennial figure for Icarus.

Such comparisons as these, taken in conjunction with Spitzer's results concerning the magnitude of the Newtonian perturbations which favorably moving near-by earth-satellites would experience, augur well for the success of attempts to use such satellites in testing the predictions of general relativity.

Finally, it should be pointed out that, at least for properly designed and placed artificial satellites, it will be possible to fix the position of perigee not by seeking that point in the satellite orbit where the angular speed is a maximum, but rather by employing continuously recording ranging devices in order to ascertain where the satellitory radius vector has its minimum value. Those who worked on the "Diana Project" felt confident that suitably designed radar-ranging instruments would be able to measure the varying distance to our relatively remote moon to the nearest tenth of a mile. There would, therefore, seem to be no insuperable difficulty in developing such radar units as would be necessary to solve the position-of-perigee problem formulated here. The importance of fixing perigeal position without reference to the angular speed of the satellite is obvious since the figures of merit, α , would thereby become dependent solely on the values of the parameters k and l . The reader can easily verify that if we take $\alpha = k l \sigma$, the following large *decennial* figures of merit

result respectively, for the various test objects considered in this paper :

4"38, 5"84, 375", and 176".

¹ J. J. Gilvarry, *Pub. A.S.P.*, **65**, 173, 1953.

² J. L. Synge, *The Relativity Theory of A. N. Whitehead* (The Institute for Fluid Dynamics and Applied Mathematics, University of Maryland, 1951) ; "Orbits and Rays in the Gravitational Field of a Finite Sphere According to the Theory of A. N. Whitehead," *Proc. R. Soc.*, **211**, 303, 1952.

³ W. De Sitter, *M.N.*, **76**, 699, 1916; **77**, 155, 1916; **78**, 3, 1917.

⁴ L. Silberstein, *The Theory of Relativity* (2d edition; London: The Macmillan Company, Ltd., 1924).

⁵ T. Levi-Civita, *Rend. Acc. Lincei*, Ser. VI, **IV**, 3, 1926.

⁶ T. Levi-Civita, *The Absolute Differential Calculus* (London: Blackie and Son, Ltd., 1927).

⁷ Cf. ref. 1, *loc. cit.*, p. 174.

⁸ L. Spitzer, Jr., *J. Brit. Interplan. Soc.*, **9**, 131, 1950.

⁹ Cf. ref. 1, *loc. cit.*, Table 1.

¹⁰ Cf. ref. 1, *loc. cit.*, p. 176.