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THE
DEMON-
HAUNTED
WORLD

Science as a Candle in the Dark

CARL
SAGAN

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Chapter 4
ALIENS

"Truly, that which makes me believe there is no inhabitant on this sphere, is that it seems to me that no sensible being would be willing to live here."

"Well, then!" said Micromegas, "perhaps the beings that inhabit it do not possess good sense."

One alien to another, on approaching the Earth, in *V O L T A I R E ' S*

Micromegas: A Philosophical History (1752)

It's still dark out. You're lying in bed, fully awake. You discover you're utterly paralyzed. You sense someone in the room. You try to cry out. You cannot. Several small gray beings, less than four feet tall, are standing at the foot of the bed. Their heads are pear-shaped, bald, and large for their bodies. Their eyes are enormous, their faces expressionless and identical. They wear tunics and boots. You hope this is only a dream. But as nearly as you can tell it's really happening. They lift you up and, eerily, they and you slip through the wall of your bedroom. You float out into the air. You rise high toward a metallic saucer-shaped spacecraft. Once inside, you are escorted into a medical examining room. A larger but similar being—evidently some kind of physician—takes over. What follows is even more terrifying.

Your body is probed with instruments and machines, especially your sexual parts. If you're a man, they may take sperm samples; if you're a woman, they may remove ova or fetuses, or implant semen. They may force you to have sex. Afterwards you may be ushered into a different room where hybrid babies or fetuses, partly human and partly like these creatures, stare back at you. You may be given an admonition about human misbehavior, especially in despoiling the environment or in allowing the AIDS pandemic; tableaux of future devastation are offered. Finally, these cheerless gray emissaries escort you out of the spacecraft and ooze you back through the walls into your bed. By the time you're able to move and talk . . . they're gone.

You may not remember the incident right away. Instead you might simply find some period of time unaccountably missing, and puzzle over it. Because all this seems so weird, you're a little concerned about your sanity. Naturally you're reluctant to talk about it. At the same time the experience is so disturbing that it's hard to keep it bottled up. It all pours out when you hear of similar accounts, or when you're under hypnosis with a sympathetic therapist, or even when you see a picture of an "alien" in one of the many popular magazines, books,

and TV "specials" on UFOs. Some people say they can recall such experiences from early childhood. Their own children, they think, are now being abducted by aliens. It runs in families. It's a eugenics program, they say, to improve the human breeding stock. Maybe aliens have always done this. Maybe, some say, that's where humans came from in the first place.

As revealed by repeated polls over the years, most Americans believe that we're being visited by extraterrestrial beings in UFOs. In a 1992 Roper poll of nearly 6,000 American adults—especially commissioned by those who accept the alien abduction story at face value—18 percent reported sometimes waking up paralyzed, aware of one or more strange beings in the room. About 13 percent report odd episodes of missing time, and 10 percent claim to have flown through the air without mechanical assistance. From nothing more than these results, the poll's sponsors conclude that two percent of all Americans have been abducted, many repeatedly, by beings from other worlds. The question of whether respondents had been abducted by aliens was never actually put to them.

If we believed the conclusion drawn by those who bankrolled and interpreted the results of this poll, and if aliens are not partial to Americans, then the number for the whole planet would be more than a hundred million people. This means an abduction every few seconds over the past few decades. It's surprising more of the neighbors haven't noticed.

What's going on here? When you talk with self-described abductees, most seem very sincere, although caught in the grip of powerful emotions. Some psychiatrists who've examined them say they find no more evidence of psychopathology in them than in the rest of us. Why should anyone claim to have been abducted by alien creatures if it never happened? Could all these people be mistaken, or lying, or hallucinating the same (or a similar) story? Or is it arrogant and contemptuous even to question the good sense of so many?

On the other hand, could there really be a massive alien invasion; repugnant medical procedures performed on millions of innocent men, women, and children; humans apparently used as breeding stock over many decades—and all this not generally known and dealt with by responsible media, physicians, scientists, and the governments sworn to protect the lives and well-being of their citizens? Or, as many

have suggested, is there a massive government conspiracy to keep the citizens from the truth?

Why should beings so advanced in physics and engineering—crossing vast interstellar distances, walking like ghosts through walls—be so backward when it comes to biology? Why, if the aliens are trying to do their business in secret, wouldn't they perfectly expunge all memories of the abductions? Too hard for them to do? Why are the examining instruments macroscopic and so reminiscent of what can be found at the neighborhood medical clinic? Why go to all the trouble of repeated sexual encounters between aliens and humans? Why not steal a few egg and sperm cells, read the full genetic code, and then manufacture as many copies as you like with whatever genetic variations happen to suit your fancy? Even we humans, who as yet cannot quickly cross interstellar space or slither through walls, are able to clone cells. How could humans be the result of an alien breeding program if we share 99.6 percent of our active genes with the chimpanzees? We're more closely related to chimps than rats are to mice. The preoccupation with reproduction in these accounts raises a warning flag—especially considering the uneasy balance between sexual impulse and societal repression that has always characterized the human condition, and the fact that we live in a time fraught with numerous ghastly accounts, both true and false, of childhood sexual abuse.

Contrary to many media reports,* the Roper pollsters and those who wrote the "official" report never asked whether their subjects had been abducted by aliens. They deduced it: Those who've ever awakened with strange presences around them, who've ever unaccountably seemed to fly through the air, and so on, have therefore been abducted. The pollsters didn't even check to see if sensing presences, flying, etc. were part of the same or separate incidents. Their conclusion—that millions of Americans have been so abducted—is spurious, based on careless experimental design.

Still, at least hundreds of people, perhaps thousands, claiming they have been abducted, have sought out sympathetic therapists or joined abductee support groups. Others may have similar complaints but,

* For example, the September 4, 1994 *Publishers Weekly*: "According to a Gallup [sic] poll, more than three million Americans believe they have been abducted by aliens."

fearing ridicule or the stigma of mental illness, have refrained from speaking up or getting help.

Some abductees are also said to be reluctant to talk for fear of hostility and rejection by headline skeptics (although many willingly appear on radio and TV talk shows). Their diffidence supposedly extends even to audiences that already believe in alien abductions. But maybe there's another reason: Might the subjects themselves be unsure—at least at first, at least before many retellings of their story—whether it was an external event they are remembering or a state of mind?

“One unerring mark of the love of truth,” wrote John Locke in 1690, “is not entertaining any proposition with greater assurance than the proofs it is built upon will warrant.” On the matter of UFOs, how strong are the proofs?

The phrase “flying saucer” was coined when I was entering high school. The newspapers were full of stories about ships from beyond in the skies of Earth. It seemed pretty believable to me. There were lots of other stars, at least some of which probably had planetary systems like ours. Many stars were as old or older than the Sun, so there was plenty of time for intelligent life to evolve. Caltech's Jet Propulsion Laboratory had just flown a two-stage rocket high above the Earth. Clearly we were on our way to the Moon and the planets. Why shouldn't other, older, wiser beings be able to travel from their star to ours? Why not?

This was only a few years after the bombing of Hiroshima and Nagasaki. Maybe the UFO occupants were worried about us, and sought to help us. Or maybe they wanted to make sure that we and our nuclear weapons didn't come and bother *them*. Many people seemed to see flying saucers—sober pillars of the community, police officers, commercial airplane pilots, military personnel. And apart from some harumphs and giggles, I couldn't find any counterarguments. How could all these eyewitnesses be mistaken? What's more, the saucers had been picked up on radar, and pictures had been taken of them. You could see the photos in newspapers and glossy magazines. There were even reports about crashed flying saucers and little alien bodies with perfect teeth stiffly languishing in Air Force freezers in the Southwest.

The prevailing climate was summarized in *Life* magazine a few

years later, in these words: “These objects cannot be explained by present science as natural phenomena—but solely as artificial devices, created and operated by a high intelligence.” Nothing “known or projected on Earth could account for the performance of these devices.”

And yet not a single adult I knew was preoccupied with UFOs. I couldn't figure out why not. Instead they were worried about Communist China, nuclear weapons, McCarthyism, and the rent. I wondered if they had their priorities straight.

In college, in the early 1950s, I began to learn a little about how science works, the secrets of its great success, how rigorous the standards of evidence must be if we are really to know something is true, how many false starts and dead ends have plagued human thinking, how our biases can color our interpretation of the evidence, and how often belief systems widely held and supported by the political, religious, and academic hierarchies turn out to be not just slightly in error, but grotesquely wrong.

I came upon a book called *Extraordinary Popular Delusions and the Madness of Crowds*, written by Charles Mackay in 1841, and still in print. In it could be found the histories of boom-and-bust economic crazes, including the Mississippi and South Sea “Bubbles” and the extravagant run on Dutch tulips, scams that bamboozled the wealthy and titled of many nations; a legion of alchemists, including the poignant tale of Mr. Kelly and Dr. Dee (and Dee's eighty-year-old son Arthur, impressed by his desperate father into communicating with the spirit world by peering into a crystal); dolorous accounts of unfulfilled prophecy, divination, and fortune-telling; the persecution of witches; haunted houses; “popular admiration of great thieves”; and much else. Entertainingly portrayed was the Count of St. Germain, who dined out on the cheerful pretension that he was centuries old if not actually immortal. (When, at dinner, incredulity was expressed at his recounting of his conversations with Richard the Lion-Hearted, he turned to his man-servant for confirmation. “You forget, sir,” was the reply, “I have been only five hundred years in your service.” “Ah, true,” said St. Germain, “it was a little before your time.”)

A riveting chapter on the Crusades began

Every age has its peculiar folly: some scheme, project, or phantasy into which it plunges, spurred on either by the love of gain, the

necessity of excitement, or the mere force of imitation. Failing in these, it has some madness, to which it is goaded by political or religious causes, or both combined.

The edition I first read was adorned by a quote from the financier and adviser of presidents, Bernard M. Baruch, attesting that reading Mackay had saved him millions.

There had been a long history of spurious claims that magnetism could cure disease. Paracelsus, for example, used a magnet to suck diseases out of the human body and dispose of them into the Earth. But the key figure was Franz Mesmer. I had vaguely understood the word “mesmerize” to mean something like hypnotize. But my first real knowledge of Mesmer came from Mackay. The Viennese physician had thought that the positions of the planets influenced human health, and was caught up in the wonders of electricity and magnetism. He catered to the declining French nobility on the eve of the Revolution. They crowded into a darkened room. Dressed in a gold-flowered silk robe and waving an ivory wand, Mesmer seated his marks around a vat of dilute sulfuric acid. The Magnetizer and his young male assistants peered deeply into the eyes of their patients, and rubbed their bodies. They grasped iron bars protruding into the solution or held each other's hands. In contagious frenzy, aristocrats — especially young women — were cured left and right.

Mesmer became a sensation. He called it “animal magnetism.” For the more conventional medical practitioner, though, this was bad for business, so French physicians pressured King Louis XVI to crack down. Mesmer, they said, was a menace to public health. A commission was appointed by the French Academy of Sciences that included the pioneering chemist, Antoine Lavoisier, and the American diplomat and expert on electricity, Benjamin Franklin. They performed the obvious control experiment: When the magnetizing effects were performed without the patient's knowledge, no cures were effected. The cures, if any, the commission concluded, were all in the mind of the beholder. Mesmer and his followers were undeterred. One of them later urged the following attitude of mind for best results:

Forget for a while all of your knowledge of physics. . . . Remove from your mind all objections that may occur. . . . Never reason for

six weeks. . . . Be very credulous; be very persevering; reject all past experience, and do not listen to reason.

Oh, yes, a final piece of advice: “Never magnetize before inquisitive persons.”

Another eye-opener was Martin Gardner's *Fads and Fallacies in the Name of Science*. Here was Wilhelm Reich uncovering the key to the structure of galaxies in the energy of the human orgasm; Andrew Crosse creating microscopic insects electrically from salts; Hans Hörbiger under Nazi aegis announcing that the Milky Way was made not of stars, but of snowballs; Charles Piazzi Smyth discovering in the dimensions of the Great Pyramid of Gizeh a world chronology from the Creation to the Second Coming; L. Ron Hubbard writing a manuscript able to drive its readers insane (was it ever proofed? I wondered); the Bridey Murphy case, which led millions into concluding that at last there was serious evidence of reincarnation; Joseph Rhine's “demonstrations” of ESP; appendicitis cured by cold water enemas, bacterial diseases by brass cylinders, and gonorrhea by green light — and amid all these accounts of self-deception and charlatany, to my surprise a chapter on UFOs.

Of course, merely by writing books cataloging spurious beliefs, Mackay and Gardner came across, at least a little, as grumpy and superior. Was there nothing they accepted? Still, it was stunning how many passionately argued and defended claims to knowledge had amounted to nothing. It slowly dawned on me that human fallibility being what it is, there might be other explanations for flying saucers.

I had been interested in the possibility of extraterrestrial life from childhood, from long before I ever heard of flying saucers. I've remained fascinated long after my early enthusiasm for UFOs waned — as I understood more about that remorseless taskmaster called the scientific method: Everything hinges on the matter of evidence. On so important a question, the evidence must be airtight. The more we want it to be true, the more careful we have to be. No witness's say-so is good enough. People make mistakes. People play practical jokes. People stretch the truth for money or attention or fame. People occasionally misunderstand what they're seeing. People sometimes even see things that aren't there.

Essentially all the UFO cases were anecdotes, something asserted.

UFOs were described variously as rapidly moving or hovering; disc-shaped, cigar-shaped, or ball-shaped; moving silently or noisily; with a fiery exhaust, or with no exhaust at all; accompanied by flashing lights, or uniformly glowing with a silvery cast, or self-luminous. The diversity of the observations hinted that they had no common origin, and that the use of such terms as UFOs or "flying saucers" served only to confuse the issue by grouping generically a set of unrelated phenomena.

There was something odd about the very invention of the phrase "flying saucer." As I write this chapter, I have before me a transcript of an April 7, 1950 interview between Edward R. Murrow, the celebrated CBS newsmen, and Kenneth Arnold, a civilian pilot who saw something peculiar near Mount Rainier in the state of Washington on June 24, 1947 and who in a way coined the phrase. Arnold claims that the newspapers

did not quote me properly. . . . When I told the press they misquoted me, and in the excitement of it all, one newspaper and another one got it so ensnared up that nobody knew just exactly what they were talking about. . . . These objects more or less flattered like they were, oh, I'd say, boats on very rough water. . . . And when I described how they flew, I said that they flew like they take a saucer and throw it across the water. Most of the newspapers misunderstood and misquoted that, too. They said that I said that they were saucer-like; I said that they flew in a saucer-like fashion.

Arnold thought he saw a train of nine objects, one of which produced a "terrific blue flash." He concluded they were a new kind of winged aircraft. Murrow summed up: "That was an historic misquote. While Mr. Arnold's original explanation has been forgotten, the term 'flying saucer' has become a household word." Kenneth Arnold's flying saucers looked and behaved quite differently from what in only a few years would be rigidly particularized in the public understanding of the term: something like a very large and highly maneuverable frisbee.

Most people honestly reported what they saw, but what they saw were natural, if unfamiliar, phenomena. Some UFO sightings turned out to be unconventional aircraft, conventional aircraft with unusual lighting patterns, high-altitude balloons, luminescent insects, planets seen under unusual atmospheric conditions, optical mirages and

looming, lenticular clouds, ball lightning, sundogs, meteors including green fireballs, and satellites, nosecones, and rocket boosters spectacularly reentering the atmosphere.* Just conceivably, a few might be small comets dissipating in the upper air. At least some radar reports were due to "anomalous propagation"—radio waves traveling curved paths due to atmospheric temperature inversions. Traditionally, they were also called radar "angels"—something that seems to be there but isn't. You could have simultaneous visual and radar sightings without there being any "there" there.

When we notice something strange in the sky, some of us become excitable and uncritical, bad witnesses. There was the suspicion that the field attracted rogues and charlatans. Many UFO photos turned out to be fakes—small models hanging by thin threads, often photographed in a double exposure. A UFO seen by thousands of people at a football game turned out to be a college fraternity prank—a piece of cardboard, some candles, and a thin plastic bag that dry cleaning comes in, all cobbled together to make a rudimentary hot air balloon.

The original crashed saucer account (with the little alien men and their perfect teeth) turned out to be a straight-out hoax. Frank Scully, columnist for *Variety*, passed on a story told by an oilman friend; it played a central dramatic role in Scully's best-selling 1950 book, *Behind the Flying Saucers*. Sixteen dead aliens from Venus, each three feet high, had been found in one of three crashed saucers. Booklets with alien pictograms had been recovered. The military was covering up. The implications were profound.

The hoaxers were Silas Newton, who said he used radio waves to prospect for gold and oil, and a mysterious "Dr. Gee" who turned out to be a Mr. GeBauer. Newton produced a gear from the UFO machinery and flashed close-up saucer photos. But he did not allow close inspection. When a prepared skeptic, through sleight of hand, switched gears and sent the alien artifact away for analysis, it turned out to be made of kitchen-pot aluminum.

The crashed saucer scam was a small interlude in a quarter-century of frauds by Newton and GeBauer—chiefly selling worthless oil leases

* There are so many artificial satellites up there that they're always making garish displays somewhere in the world. Two or three decay every day in the Earth's atmosphere, the flaming debris often visible to the naked eye.

and prospecting machines. In 1952 they were arrested by the FBI, and the following year found guilty of conducting a confidence game. Their exploits—chronicled by the historian Curtis Peebles—ought to have made UFO enthusiasts cautious forever about crashed saucer stories from the American Southwest around 1950. No such luck.

On October 4, 1957, *Sputnik 1*, the first Earth-orbiting artificial satellite, was launched. Of 1,178 recorded UFO sightings in America that year, 701, or 60 percent—rather than the 25 percent you'd expect—occurred between October and December. The clear implication is that Sputnik and its attendant publicity somehow generated UFO reports. Perhaps people were looking at the night sky more, and saw more natural phenomena they didn't understand. Or could it be they looked up more and saw more of the alien spacecraft that are there all the time?

The idea of flying saucers had dubious antecedents, tracing back to a conscious hoax entitled *I Remember Lemuria!*, written by Richard Shaver, and published in the March 1945 number of the pulp fiction periodical *Amazing Stories*. It was exactly the sort of stuff I devoured as a child. Lost continents were settled by space aliens 150,000 years ago, I was informed, leading to the creation of a race of demonic underground beings responsible for human tribulations and the existence of evil. The editor of the magazine, Ray Palmer—who was, like the subterranean beings he warned about, roughly four feet high—promoted the notion, well before Arnold's sighting, that the Earth is being visited by disc-shaped alien spacecraft and that the government is covering up its knowledge and complicity. Merely from the newsstand covers of such magazines, millions of Americans were exposed to the idea of flying saucers well before the term was coined.

All in all, the alleged evidence seemed thin—most often devolving into gullibility, hoax, hallucination, misunderstanding of the natural world, hopes and fears disguised as evidence, and a craving for attention, fame, and fortune. Too bad, I remember thinking.

Since then, I've been lucky enough to be involved in sending spacecraft to other planets to look for life, and in listening for possible radio signals from alien civilizations, if any, on planets of distant stars. We've had a few tantalizing moments. But if the suspected signal isn't available for every grumpy skeptic to pick over, we cannot call it evidence of extraterrestrial life—no matter how appealing we find the notion.

We'll just have to wait until, if such a time ever comes, better data are available. We've not yet found compelling evidence for life beyond the Earth. We're only at the very beginning of the search, though. New and better information might emerge, for all we know, tomorrow.

I don't think anyone could be more interested than I am in whether we're being visited. It would save me so much time and effort to be able to study extraterrestrial life directly and nearby, rather than at best indirectly and at a great distance. Even if the aliens are short, dour, and sexually obsessed—if they're here, I want to know about them.

How modest our expectations are about "aliens," and how shoddy the standards of evidence that many of us are willing to accept, can be found in the saga of the crop circles. Originating in Great Britain and spreading throughout the world was something suppassing strange.

Farmers or passersby would discover circles (and, in later years, much more complex pictograms) impressed upon fields of wheat, oats, barley, and rapeseed. Beginning with simple circles in the middle 1970s, the phenomenon progressed year by year, until by the late 1980s and early 1990s the countryside, especially in southern England, was graced by immense geometrical figures, some the size of football fields, imprinted on cereal grain before the harvest—circles tangent to circles, or connected by axes, parallel lines drooping off, "insectoids." Some of the patterns showed a central circle surrounded by four symmetrically-placed smaller circles—clearly, it was concluded, caused by a flying saucer and its four landing pods.

A hoax? Impossible, almost everyone said. There were hundreds of cases. It was done sometimes in only an hour or two in the dead of night, and on such a large scale. No footprints of pranksters leading towards or away from the pictograms could be found. And besides, what possible motive could there be for a hoax?

Many less conventional conjectures were offered. People with some scientific training examined sites, spun arguments, instituted whole journals devoted to the subject. Were the figures caused by strange whirlwinds called "columnar vortices," or even stranger ones called "ring vortices"? What about ball lightning? Japanese investigators tried to simulate, in the laboratory and on a small scale, the plasma physics they thought was working its way on far-off Wiltshire.

I receive many letters about it, frequently with detailed first-hand accounts. Sometimes momentous revelations are promised if only I will call the letter writer. After I give lectures—on almost any subject—I often am asked, “Do you believe in UFOs?” I’m always struck by how the question is phrased, the suggestion that this is a matter of belief and not of evidence. I’m almost never asked, “How good is the evidence that UFOs are alien spacecrafts?”

I’ve found that the going-in attitude of many people is highly predetermined. Some are convinced that eyewitness testimony is reliable, that people do not make things up, that hallucinations or hoaxes on such a scale are impossible, and that there must be a long-standing, high-level government conspiracy to keep the truth from the rest of us. Cullibility about UFOs thrives on widespread mistrust of government, arising naturally enough from all those circumstances where—in the tension between public well-being and “national security”—the government lies. As government deceit and conspiracies of silence have been exposed on so many other matters, it’s hard to argue that a cover-up on this odd subject is impossible, that the government would never hide important information from its citizens. A common explanation on why there would be a cover-up is to prevent worldwide panic or erosion of confidence in the government.

I was a member of the U.S. Air Force Scientific Advisory Board committee that investigated the Air Force’s UFO study—called “Project Bluebook,” but earlier and revealingly called “Project Grudge.” We found the on-going effort to be lackadaisical and dismissive. In the middle 1960s, “Project Bluebook” was headquartered at Wright-Patterson Air Force Base in Ohio—where “Foreign Technical Intelligence” (chiefly, understanding what new weapons the Soviets had) was also based. They had state-of-the-art technology in file retrieval. You asked about a given UFO incident and, somewhat like sweaters and suits at the dry cleaner’s today, reams of files made their way past you, until the engine stopped when the file you wanted arrived before you.

But what was *in* those files wasn’t worth much. For example, senior citizens reported lights hovering over their small New Hampshire town for more than an hour, and the case is explained as a wing of strategic bombers from a nearby Air Force base on a training exercise. Could the bombers take an hour to pass over the town? No. Did the bombers fly over at the time the UFOs were reported? No. Can you

explain to us, Colonel, how strategic bombers can be described as “hovering”? No. The shipshod Bluebook investigations played little scientific role, but they did serve the important bureaucratic purpose of convincing much of the public that the Air Force was on the job; and that maybe there was nothing to UFO reports.

Of course, this doesn’t preclude the possibility that another, more serious, more scientific study of UFOs was going on somewhere else—headed, say, by a brigadier general rather than a lieutenant colonel. I think something like this is even likely, not because I believe we’re being visited by aliens, but because hiding in the UFO phenomena must be data once considered of significant military interest. Certainly if UFOs are as reported—very fast, very maneuverable craft—there is a military duty to find out how they work. If UFOs were built by the Soviet Union it was the Air Force’s responsibility to protect us. Considering the remarkable performance characteristics reported, the strategic implications of Soviet UFOs flagrantly overflying American military and nuclear facilities were worrisome. If on the other hand the UFOs were built by extraterrestrials, we might copy the technology (if we could get our hands on just one saucer) and secure a huge advantage in the Cold War. And even if the military believed that UFOs were manufactured neither by Soviets nor by extraterrestrials, there was a good reason to follow the reports closely:

In the 1950s balloons were being extensively used by the Air Force—not just as weather measurement platforms, as prominently advertised, and radar reflectors, as acknowledged, but also, secretly, as robotic espionage craft, with high-resolution cameras and signal intelligence devices. While the balloons themselves were not very secret, the reconnaissance packages they carried were. High-altitude balloons can seem saucer-shaped when seen from the ground. If you mistake how far away they are, you can easily imagine them going absurdly fast. Occasionally, propelled by a gust of wind, they make abrupt changes in direction, uncharacteristic of aircraft and in seeming defiance of the conservation of momentum—if you don’t realize that they’re hollow and weigh almost nothing.

The most famous of these military balloon systems, widely tested over the United States in the early 1950s, was called “Skyhook.” Other balloon systems and projects were designated “Mogul,” “Moby Dick,” “Grandson,” and “Genetrix.” Umer Lidell, who had some responsibility

ity for these missions at the Naval Research Laboratory, and who was later a NASA official, once told me he thought all UFO reports were due to military balloons. While "all" is going too far, their role has, I think, been insufficiently appreciated. So far as I know there has never been a systematic and intentional control experiment—in which high-altitude balloons were secretly released and tracked, and UFO reports from visual and radar observers noted.

In 1956, overflights of the Soviet Union by U.S. reconnaissance balloons began. At their peak there were dozens of balloon launches a day. Balloon overflights were then replaced by high-altitude aircraft, such as the U-2, which in turn were largely replaced by reconnaissance satellites. Many UFOs dating from this period were clearly scientific balloons, as are some since. High-altitude balloons are still being launched—including platforms carrying cosmic ray sensors, optical and infrared telescopes, radio receivers probing the cosmic background radiation, and other instruments above most of the Earth's atmosphere.

A great-to-do has been made of one or more alleged crashed flying saucers near Roswell, New Mexico, in 1947. Some initial reports and newspaper photographs of the incident are entirely consistent with the idea that the debris was a crashed high-altitude balloon. But other residents of the region—especially decades later—remember more exotic materials, enigmatic hieroglyphics, threats by military personnel to witnesses if they didn't keep what they knew to themselves, and the canonical story that alien machinery and body parts were packed into an airplane and flown to the Air Materiel Command at Wright-Patterson Air Force Base. Some, but not all, of the recovered alien body stories are associated with this incident.

Philip Klass, a long-time and dedicated UFO skeptic, has uncovered a subsequently declassified letter dated July 27, 1948, a year after the Roswell "incident," from Major General C. B. Cabell—then Director of Intelligence for the U.S. Air Force (and later, as a CIA official, a major figure in the abortive U.S. invasion of Cuba at the Bay of Pigs). Cabell was inquiring of those who reported to him on what UFOs might be. He hadn't a clue. In an October 11, 1948 summary response, explicitly including information in the possession of the Air Materiel Command, we find the Director of Intelligence being told that nobody else in the Air Force had a clue either. This makes it un-

likely that UFO fragments and occupants had made their way to Wright-Patterson the year before.

What the Air Force was mostly worried about was that UFOs were Russian. Why Russians would be testing flying saucers over the United States was a puzzle to which the following four answers were proposed: "(1) To negate U.S. confidence in the atom bomb as the most advanced and decisive weapon in warfare. (2) To perform photographic reconnaissance missions. (3) To test U.S. air defenses. (4) To conduct familiarization flights [for strategic bombs] over U.S. territory." We now know that UFOs neither were nor are Russian, and however dedicated the Soviet interest may have been to objectives (1) through (4), flying saucers weren't how they pursued these objectives.

Much of the evidence regarding the Roswell "incident" seems to point to a cluster of high-altitude classified balloons, perhaps launched from nearby Alamogordo Army Air Field or White Sands Proving Ground, that crashed near Roswell, the debris of secret instruments hurriedly collected by earnest military personnel, early press reports announcing that it was a spaceship from another planet ("RAAF Captures Flying Saucer on Ranch in Roswell Region"), diverse recollections simmering over the years, and memories refreshed by the opportunity for a little fame and fortune. (Two UFO museums in Roswell are leading tourist stops.)

A 1994 report ordered by the Secretary of the Air Force and the Department of Defense in response to prodding from a New Mexico Congressman identifies the Roswell debris as remnants of a long-range, highly secret, balloon-borne low-frequency acoustic detection system called "Project Mogul"—an attempt to sense Soviet nuclear weapons explosions at tropopause altitudes. The Air Force investigators, rummaging comprehensively through the secret files of 1947, found no evidence of heightened message traffic:

There were no indications and warnings, notice of alerts, or a higher tempo of operational activity reported that would be logically generated if an alien craft, whose intentions were unknown, entered U.S. territory. . . . The records indicate that none of this happened (or if it did, it was controlled by a security system so efficient and tight that no one, U.S. or otherwise, has been able to duplicate it since. If such a system had been in effect at the time, it

Roswell
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would have also been used to protect our atomic secrets from the Soviets, which history has shown obviously was not the case.).

The radar targets carried by the balloons were partly manufactured by novelty and toy companies in New York, whose inventory of decorative icons seems to have been remembered many years later as alien hieroglyphics.

The heyday of UFOs corresponds to the time when the main delivery vehicle for nuclear weapons was being switched from aircraft to missiles. An early and important technical problem concerned re-entry—returning a nuclear-armed nosecone through the bulk of the Earth's atmosphere without burning it up in the process (as small asteroids and comets are destroyed in their passage through the upper air). Certain materials, nosecone geometries, and angles of entry are better than others. Observations of re-entry (or the more spectacular launches) could very well reveal U.S. progress in this vital strategic technology or, worse, inefficiencies in the design; such observations might suggest what defensive measures an adversary should take. Undoubtedly, the subject was considered highly sensitive.

Inevitably there must have been cases in which military personnel were told not to talk about what they had seen, or where seemingly innocuous sightings were suddenly classified top secret with severely constrained need-to-know criteria. Air Force officers and civilian scientists thinking back about it in later years might very well conclude that the government had engineered a UFO cover-up. If nosecones are judged UFOs, the charge is a fair one.

Consider spoofing. In the strategic confrontation between the United States and the Soviet Union, the adequacy of air defenses was a vital issue. It was item (3) on General Cabell's list. If you could find a weakness, it might be the key to "victory" in an all-out nuclear war. The only sure way to test your adversary's defenses is to fly an aircraft over their borders and see how long it takes for them to notice. The United States did this routinely to test Soviet air defenses.

In the 1950s and '60s, the United States had state-of-the-art radar defense systems covering its west and east coasts, and especially its northern approaches (over which a Soviet bomber or missile attack would most likely come). But there was a soft underbelly—no significant early warning system to detect the geographically much more tax-

ing southern approach. This is of course information vital for a potential adversary. It immediately suggests a spoof: One or more of the adversary's high-performance aircraft zoom out of the Caribbean, let's say, into U.S. airspace, penetrating, let's say, a few hundred miles up the Mississippi River until a U.S. air defense radar locks on. Then the intruders hightail it out of there. (Or, as a control experiment, a unit of U.S. high-performance aircraft is sequestered and sent in unannounced sorties to determine how porous American air defenses are.) In such a case, there may be combined visual and radar sightings by military and civilian observers and large numbers of independent reports. What is reported corresponds to no known aircraft. The Air Force and civilian aviation authorities truthfully state that none of their aircraft was responsible. Even if they've been urging Congress to fund a southern Early Warning System, the Air Force is unlikely to admit that Soviet or Cuban aircraft got to New Orleans, much less Memphis, before anybody caught on.

Here again, we have every reason to expect a high-level technical investigating team, Air Force and civilian observers told to keep their mouths shut, and not just the appearance but the reality of suppression of the data. Again, this conspiracy of silence need have nothing to do with alien spacecraft. Even decades later, there are bureaucratic reasons for the Department of Defense to be close-mouthed about such embarrassments. There is a potential conflict of interest between parochial concerns of the Department of Defense and the solution of the UFO enigma.

In addition, something that both the Central Intelligence Agency and the U.S. Air Force worried about then was UFOs as a means of clogging communication channels in a national crisis, and confusing visual and radar sightings of enemy aircraft—a signal-to-noise problem that in a way is the flip side of spoofing.

In view of all this, I'm perfectly prepared to believe that at least some UFO reports and analyses, and perhaps voluminous files, have been made inaccessible to the public which pays the bills. The Cold War is over, the missile and balloon technology is largely obsolete or widely available, and those who would be embarrassed are no longer on active duty. The worst that would happen, from the military's point of view, is that there would be one more acknowledged instance of the American public being misled or lied to in the interest of national se-