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HIGH-TECH ESPIONAGE

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On the evening of June 24, 1947, Kenneth Arnold was flying his private plane near the Cascade Mountains in Washington State when he saw a sight he was never to forget.

As he recounted later, he spotted nine very bright objects flying in what appeared to be a chain formation. Each about the size of a DC-3 transport plane, the objects passed within several miles of Arnold's plane at a very high speed. Arnold had never seen anything like it, and later, in trying to describe how the objects flew, he used the simile "like saucers skipping across water."

That interesting turn of phrase somehow became "flying saucers" in newspaperese (although Arnold himself never used the term), and thus was born an expression that later passed into the language. More importantly, Arnold's sighting, the first such incident in a long list of similar sightings that went on for years, set off the flying saucer craze—the belief, still held by many, that alien spaceships regularly visit this planet.

But only a handful of people knew exactly what Arnold had seen. They knew that he had inadvertently spotted America's most secret intelligence operation.

How all this came to be is a story of some complexity. It is fundamentally a story of human ingenuity, for the private pilot's accidental peek into the murky world of espionage afforded only a tiny view of the most important part of that world, technical intelligence. And it is technical intelligence, still in its infancy that day back in 1947, that has come to dominate all modern espionage.

The effect has been revolutionary: The United States has constructed an elaborate technical spying system—this country's chief eyes and ears—undreamed of in the long history of the world's second-oldest profession.

Kenneth Arnold knew nothing of this when he accidentally stumbled across part of the secret 38 years ago. Nor did he know that he had seen, at least in part, the collective genius of a Japanese balloonist, an irascible American aircraft designer, and a college dropout who was determined to prove the experts wrong.

Together, they helped to develop an unrivaled system that has not only come to assume virtually all the functions of American intelligence, but has caused the traditional cloak-and-dagger human spy to all but disappear. That quaint practitioner of espionage has been supplanted by a huge web of electronic and other technical systems that promise fulfillment of the ancient dream of all espionage: specific, unequivocal, and detailed intelligence, safely beyond the reach of anyone trying to intercept it.

So much for the dream—the reality is quite something else. For however wondrous and all-encompassing modern intelligence technology might be, it has proven unable to answer intelligence questions with certitude. And ironically enough, the more detailed, accurate, and sweeping these technical systems, the more arguments they seem to incite about just what they are seeing (and whether they have seen *everything* worth seeing).

What has happened is what no one could have anticipated in 1947—including, as we shall see, the creation of the flying saucer craze.

Modern technical intelligence was born in the great British aerial reconnaissance and photo-interpretation operation of World War II. By comparison, U.S. technical intelligence at the beginning of the war was somewhere in the Dark Ages. A crash program put the United States in the forefront of aerial reconnaissance almost overnight. The key to that achievement lay in the American bases ringing Germany and German-occupied territory. From those bases, the Americans could fly missions and return. That advantage disappeared with the advent of the Cold War, even the newest-model planes had no hope of carrying out unescorted strategic reconnaissance missions (journeys several thousand miles long) over Eastern Europe and the Soviet Union. The Red Air Force was large and alert; backed by ground-based radar, it was capable of checkmating any reconnaissance overflight.

Yet the need for such reconnaissance was growing more acute. The answer, obviously, was some sort of airborne platform that could overfly the vast distances of the Soviet Union out of range of fighter planes, take pictures, and return safely to base. The most advanced U.S. reconnaissance aircraft of the post-war period, the RB-47 (essentially a souped-up reconnaissance version of the B-47 jet bomber), carried seven precision cameras, which, operating automatically, could photograph one million square miles of territory during a three-hour flight, recording a strip 490 miles wide by 2,700 miles long.

But the Soviet Union's most important strategic facilities—their largest military airfields, nuclear testing sites, major industries, etc.—lay thousands of miles inland; however impressive the RB-47's capabilities, it could not possibly get pictures of those sites without overflying the Soviet interior. And that, given the formidable Soviet defenses, was not feasible. How, then, could it be done?

In 1933, Reikichi Rada was named head of the Japanese military's Scientific Laboratory, which (among other assignments) was trying to solve the problem of how to bomb enemy targets at intercontinental ranges. No foreseeable development in airplane technology seemed capable of producing such an aircraft, so Rada hit upon an innovative idea: Balloons would be armed with bombs and then sent to drift into enemy territory, where the bombs would be automatically released.

After Pearl Harbor, Rada was eager to demonstrate that his idea would work. With prevailing winds unique to Japan, he discovered that a balloon launched from Japan's east coast could drift 6,200 miles to the United States' west coast.

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Next, Rada developed an ingenious automatic system for the balloon that dropped ballast to keep the balloon at a constant altitude during the flight, then loosed an incendiary or other type of bomb as the balloon settled to earth somewhere in the United States.

The Rada-designed balloons were launched eastward in the fall of 1944. Operation Fu-Go, as the Japanese called it, was on.

As the world's first intercontinental military attack, Fu-Go was not a glittering success—although it did cause some panic in American intelligence, which clamped down a tight lid of secrecy in order to prevent the Japanese from learning whether their balloon attacks were successful. The first balloons began floating over the United States in November 1944, and by April of the following year, when the Japanese gave up Fu-Go, a total of 285 balloons had been spotted. Most had been intercepted over the ocean or malfunctioned, although one woman and her five children were killed in Oregon when a Fu-Go bomb exploded. The Japanese had launched nearly 4,000 of the balloons toward the U.S. mainland, and, given the fact that only a small percentage of them ever reached their target, Fu-Go was a failure.

The failure, however, was only in military terms. From an intelligence standpoint, Fu-Go was a success—at least to the Americans, for it provided them with the germ of an idea on how to get intelligence on the Soviet Union.

The idea was born in the series of intelligence reports prepared by the Army and Navy on the Fu-Go flights. One glaring fact stood out in those reports: The Japanese had managed to fly by remote control a very stable airborne platform at distances of over 6,000 miles. Instead of bombs, what if such balloons were armed with cameras? Could similar types of balloons be launched into prevailing winds sweeping over the Soviet Union?

By coincidence, the Air Force was running an extensive meteorological research program at the time called Moby Dick. Operated in conjunction with the Navy's Office of Naval Research, Moby Dick aimed to uncover some of the mysteries of the upper atmosphere, where future aircraft (and missiles) were to operate. The program used the latest in high-altitude weather-research balloons, a large gasbag called Skyhook. The first models were about 300 cubic feet in size and capable of rising to over 120,000 feet. The high altitude was made possible by use of an innovative, partially transparent plastic material, which reflected the sun in a diffused rainbow of colors. More significantly, in the context of the curious role Skyhook was to play later on, the balloon also changed shape as it rode into less dense air and its helium gas filled out. The balloon would change from an ice-cream-cone shape to a near-circle; then, as it moved violently in the winds of the upper atmosphere, it would become almost saucer-shaped.

The tendency of Skyhook to change shape, especially into the form of what appeared to be a saucer, caused a major and unanticipated headache in the Moby Dick program. One of the initial test flights of Skyhook in 1947 was spotted by Kenneth Arnold, and the flying saucer scare was on. As the people running Moby Dick were aware, the sightings almost perfectly described what happened to the Skyhook balloon as it encountered the strong winds of the upper atmosphere: The balloon flattened out in the shape of a saucer and was yanked around violently, while reflecting sunlight in shades of blue, red, and green. In other words, a classic flying saucer (or, later, "UFO") report.

The flying saucer scare became serious. In 1948, an Air Force pilot was killed while chasing a mysterious UFO (actually a Skyhook test flight), and there was no end of reported UFO sightings. The difficulty was that no one who knew anything about Moby Dick could discuss the program publicly, for by that time it had become a classified intelligence operation. Operating from secret launching sites in Europe (where they precipitated another UFO scare), Skyhook balloons were launched into the prevailing winds sweeping west to east over the Soviet Union. They were hooked up with cameras and radio gear; when they reached Japan after a flight across the Soviet heartland, a radio signal sent from the ground would tell Skyhook to detach its instrument package. (Later, Air Force pilots developed a special trapezelike hook, attached to cargo planes, which caught the balloon's shroud lines and recaptured the entire Skyhook, ready to be flown another day.)

Ultimately, Moby Dick was a failure. Many of the balloons crashed in the Soviet Union, and those few which made the entire flight produced spotty results. Improvements in Soviet air-defense radar—balloons, because of their large surface area, make perfect radar targets—eventually spelled the end of Moby Dick. The last balloon flight over the Soviet Union took place in 1958.

Despite its ultimate failure, a number of valuable lessons were learned from Moby Dick. Most importantly, it proved that overflights of the Soviet Union were possible and that reconnaissance pictures could be taken from high altitudes. The central problem remained, however: A stable, safe platform was needed, something that not only would be impervious to the Soviet air-defense system, but also would not risk the lives of valuable pilots. Soviet defenses were beginning to exact a high price for intelligence-gathering flights. By 1948, 40 American planes had been shot down while flying along or across the Iron Curtain, forcing reconnaissance missions to become increasingly cautious. The trend was obvious: As Soviet radars and MIG fighters improved, the American spy planes would become increasingly endangered.

The possibility of a complete cutoff of American reconnaissance of the Soviet Union presented an especially stark problem: If there were no reconnaissance, how would it be known that Russian intercontinental bombers or missiles had been launched against the United States?

It was the fear of a Soviet surprise attack—and the realization that American intelligence had no real capability for detecting it—that led President Eisenhower in 1954 to appoint a special panel of experts to come up with a solution.

The panel had a number of subcommittees examining the problem of detecting a surprise attack, the most important of which was the group studying U.S. intelligence capabilities. The subcommittee included a remarkable character named Edwin H. Land, the inventor, founder, and president of Polaroid. A notoriously reticent man (he has only given two press conferences in 35 years), Land was in the classic tradition of the great American tinkerer/inventor. He had dropped out of Harvard during 1937; then he taught himself the intricacies of polarized light, mostly by holing up in a room at the New York Public Library and reading his way through anything about the subject he could get his hands on. Land went into business for himself in an old Massachusetts garage, ultimately developing 530 patents—including his most famous, the self-developing camera. Polaroid, the name he coined to describe the process, became an American household word.

Land was very much in the "can do" spirit of American inventiveness, and to him, the problem of getting intelligence on the Soviet Union was soluble—provided that the customary bureaucratic inertia was overcome, along with the reluctance of experts, who decreed that taking clear pictures from heights of about 70,000 feet was impossible. Land's insistence was no small factor in the panel's final conclusion that the solution to the problem of American intelligence was strategic reconnaissance, using a stable platform that could overfly targets above 70,000 feet and take detailed photographs.

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Land had vowed the photographic problem could be solved, but what about the platform? That seemed to be a more knotty problem, but the panel noted that a number of high-performance test aircraft might possibly be converted into such platforms—assuming that considerable technological problems were solved.

At that point, the panel had the good fortune to encounter Clarence "Kelly" Johnson, of Lockheed—a man who was already a legend in the airplane-design business. He had made his mark with a number of aeronautical miracles, among them the first American jet fighter, the F-80 "Shooting Star," which in 1945 took an unheard-of total of 141 days from design to production.

Johnson did not suffer fools gladly, and his independent style, hands-on philosophy, and disregard for bureaucratic convention were nervously tolerated by Lockheed executives, a number of whom Johnson did not hesitate to upbraid when he thought they were interfering in his projects. (Once, when asked the secret of his success, Johnson snapped, "I get a few good men and drown the rest.")

Lockheed had the sense to leave its brilliant, if somewhat foul-tempered, designer alone. Johnson spent most of his time in what was officially known as Air Force Plant No. 42 (on the edge of the desert at Lockheed's Palmdale, California, plant), working out designs that were literally made by hand to his specifications. Plant No. 42 was more familiarly known around Lockheed as the "Skunk Works," after the mysterious still in the "Li'l Abner" comic strip that produced the famous Kickapoo Joy Juice.

Among the projects Johnson was working on in 1954 was a test airplane known innocuously as Utility-2, used to test engines and other systems at high altitudes, where the next generation of jet fighters was expected to operate. One of Johnson's more innovative designs, Utility-2 was difficult to describe: something of a glider-sailplane with turbojets, long, light wings, and a needlelike shape. Although it had a phenomenal 4,000-mile range, it looked unlike any other plane ever to take to the air.

But no matter how odd it looked, the panel realized that Utility-2—soon most often referred to by its nickname, U-2—was that perfect reconnaissance platform they had been seeking. Johnson promised he could make the U-2 into a spy plane. And hooked up with a new Land invention—special long-focus cameras that could scan continuously through seven apertures—Johnson's U-2 was the most astounding technical development up to that point in the history of espionage. Here at last was the perfect spy: It could fly at the then astonishing altitude of 90,000 feet and snap detailed reconnaissance pictures, safely out of the reach of any known jet fighter, missile, or other hazard.

But only a few people connected with the U-2 knew that for all of its marvelous qualities, the plane had an Achilles' heel: a tendency to flame out at high altitudes. Flameout—the stalling of jet engines in thin air because of the lack of oxygen—was of special concern to the U-2 pilots, for it meant they had to glide down to a lower altitude, then restart the engine. But the U-2's fuel, a specially refined kerosene, was difficult to ignite. The pilots often would have to drop even lower, to approximately 30,000 feet, in order to get sufficient oxygen for restarting the engines. And 30,000 feet was where jet fighters and surface-to-air missiles could easily attack.

That is precisely what happened to pilot Francis Gary Powers on the afternoon of May 5, 1960. When he suddenly reported a flameout that afternoon, CIA officials knew he was in serious difficulty. Powers at that point was overflying the Soviet industrial city of Sverdlovsk, ringed with the most advanced surface-to-air missiles; if he had to drop to a lower altitude to restart his engine, he would come into missile range. Powers dropped to that altitude, and the U-2 was struck by a Russian surface-to-air missile.

The Powers incident did not completely end the U-2 program—the plane is still used to this day for overflights of poorly defended areas—but it did shatter the American confidence in the U-2 as the final answer to the problem of obtaining strategic intelligence on the Soviet Union. However, an even more amazing substitute was being readied.

Just before dawn on April 1, 1960, a Thor-Able rocket lifted off from Cape Canaveral, Florida, with a 290-pound satellite in its nose. Called TIROS (television and infrared observation satellite), the satellite basically was designed to photograph cloud formations from above—fulfilling a long-standing dream of meteorologists, who had claimed for years that high-altitude observation was required in order to make accurate forecasts. Additionally, the scientists hoped that observation of weather patterns on earth would afford early warning of major weather disasters, including hurricanes and typhoons.

But TIROS was also a bold experiment in espionage, designed to test whether a high-orbiting satellite—far from radar, missiles, and fighters—could carry out photographic reconnaissance. There was some question whether such reconnaissance, hundreds of miles up in space, could duplicate the U-2's capabilities; some experts argued that because so much of the earth's surface was socked in by weather systems at heights of 100 miles and above, it was very doubtful that a satellite could ever see ground targets.

TIROS carried the latest marvels of American technology—in particular, two television cameras powered by nickel cadmium batteries recharged by 9,000 solar cells. Each camera—actually a sophisticated television tube combined with a focal-plane shutter—could store the pictures it snapped on a tube screen. An electron beam converted the stored image into electronic signals, which were then transmitted directly to ground receivers or recorded on magnetic tape. When the satellite came within range of a ground station, it could be ordered by radio signal to "play" its tape for the station to pick up.

Two hours after its maiden flight began, TIROS's first pictures shocked the meteorologists and the more expectant CIA and Air Force experts who were awaiting the results: *everything* could be seen clearly. To the surprise of all the experts, TIROS showed that, in clear weather, satellite cameras saw in detail everything within the scope of their lenses. The pictures from the first pass over the Soviet Union and China were so clear that the smallest details of air-base runways, planes, missile sites, and military bases could be picked out easily, even by the untrained eye.

The stunning success of TIROS revolutionized intelligence collection almost overnight. It proved that a satellite was capable not only of obtaining sharp reconnaissance pictures, but of eliminating the need for a pilot. As an extra bonus, the satellite was invulnerable to any projected possible threat, since it operated high in space.

The United States took a quantum jump in spy-satellite capability in 1971, when the first of the Big Bird satellites were launched. They were equipped with high-resolution television cameras, which can scan wide swaths of land on every pass, supplemented by highly sophisticated cameras which take detailed pictures. Even more amazing were the KH (for "keyhole") satellites launched three years later. KH has special sensitive cameras that can measure images in terms of heat (thus detecting even subtle changes),

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along with multispectral scanning devices that register wavelengths, picking up images that even the most sensitive photographic films can't detect.

The key to the success of the American spy satellites has been U.S. technology's ability to dramatically improve ground resolution—the size of the smallest possible object distinguishable in a satellite camera's picture. A good deal of that capability has been revealed by the U.S. space program, which routinely publishes amazingly detailed pictures taken by its nonmilitary spacecraft and satellites. But even those pictures represent child's play for spy-satellite cameras, which can achieve ground resolution of about four inches from 100 miles away.

Technology has also made a number of dramatic improvements in how much data can be received from a spy satellite. In the beginning, the Air Force borrowed an old idea from the Moby Dick program and began retrieving photo capsules parachuted from satellites, using the trapeze-hook method that once snared Skyhook balloons. The method is still used for photos produced by "quick-look" spy satellites that sweep in relatively low (about 100 miles up) over a particular target to take pictures. Most satellite imagery, however, is returned by electronic signal, produced by a system aboard the satellite that takes the pictures, instantly develops them, then stores the images on a television scanner that transmits the data to earth, where they're fed into large computers for processing.

The technological revolution that created the spy satellites has also been packing ever more sophisticated capabilities into them. The reason is microcircuit chips, which can now be made five or seven microns wide (each micron is one-millionth of a meter), much thinner than a human hair. American intelligence, however, is in the forefront of an effort to develop one-micron-wide VHSICs (very high-speed integrated chips) that can store prodigious amounts of data. How much data? A map of the United States printed on a sheet of paper only 20 inches wide would show every single street in the entire country, represented by lines only a half-micron wide.

Combined with other advances in various sensing devices, that would give spy satellites a truly awesome capability. The newest generation of satellites now operating include such advances as imaging radar (which can see and map ground targets even through heavy clouds), infrared radiometer and thermal infrared scanners (which can detect underground construction), mosaic infrared detectors (which can spot heat sources at night especially missile and aircraft exhausts), and multispectral scanners (which can take several pictures at the same time in different regions of the visible light spectrum and infrared bands). Additionally, new computers allow analysts to manipulate this data to bring out subtle details.

Much less is known, however, about a second type of spy satellite—the ones that collect ELINT and COMMINT (electronics and communications intelligence). These remain the U.S. government's deepest intelligence secrets, and its chief concern.

The reason for the American concern is technology: Radar, phone scramblers, radio communication networks, and electronic warning complexes have become an important part of a nation's arsenal—and therefore a prime target for intelligence. Getting at those electronic webs in the Soviet Union has presented a problem, for most of them are deep in the heartland, out of the range of eavesdropping devices. The initial solution was to attack the web at its outer fringes.

Beginning in 1946, U.S. "ferrets," most of them cargo planes jammed with electronic listening gear, flew missions along the Iron Curtain borders. Inside the planes, military and National Security Agency electronics experts moved the receiver dials slowly, hoping to pick up any interesting transmissions from the other side of the border, ranging from tactical orders to high-level communications with Moscow.

Some of the ferrets, however, played a much more dangerous game: They would make a headlong dash across the Iron Curtain into the airspace of an Eastern European country (or, in other areas, across the Soviet border itself), deliberately setting off air-defense alarms. Those transmissions, invaluable for showing the strength, response time, and pulse levels of radars, were recorded as the ferret suddenly turned tail and headed back at top speed for home. Some didn't make it: Almost half of the several dozen American spy planes shot down by the Russians while flying the "fringe route" from 1946 to 1960 were electronics ferrets.

The ferret missions were supplemented with a wide range of sometimes ingenious efforts to tap into Soviet communication nets. Among them was one of the more bizarre operations designed to gather communications intelligence on the Soviet Union: monitoring stations set up on several small ice islands near the North Pole, where they were ideally situated to pick up Soviet military transmissions from Russian territory on the other side of the Pole (and provide warning of Soviet strategic attack). But a freak early-spring thaw in 1954 suddenly caused one of the islands to begin floating into Soviet territory—while the Air Force detachment on it wondered what would happen to them and all their monitoring equipment when they fell into Russian hands. The Air Force sent a plane to pick up the men and their equipment, but it crashed on landing and was unable to take off.

Meanwhile, Russian planes began buzzing the island, and the leader of the detachment, fearing imminent Soviet attack, ordered his men to dig in—and discovered that it was impossible to dig into the thick pack ice. To make matters worse, the monitoring equipment detected what was thought to be a flight of Soviet bombers headed for the North American continent. An alarm was radioed, and the entire American air-defense system went on alert—only to find that they had been alerted for a flight of migrating Siberian fish ducks.

An emergency Air Force helicopter finally lifted the men and their equipment off the ice island before the Russians could grab them, but the incident again demonstrated the dangers of operating communications intelligence, even on the fringes of the Soviet Union. (This episode served as the basis for the popular book and movie, *Ice Station Zebra*.)

With the advent of satellite technology, a considerable amount of ELINT and COMMINT was put aboard special ferret satellites that were piggybacked onto photo-reconnaissance satellites. The first ferret satellite was launched in 1962, and with advances in sensor technology, they are now able to record a vast amount of electronic transmissions while orbiting about 300 miles high. At that altitude, the satellites are invulnerable to attack—although there are recurring attempts to jam them electronically—but there has been much more danger associated with some of the supplements to the ferret satellites. One was an operation that converted old World War II Liberty merchant ships into floating electronics-interception platforms; packed with radars and radio receivers, the ships, including the ill-fated *Liberty* and *Pueblo*, slowly sailed in waters just off the borders of assorted hot spots, recording every electronic transmission they could reach. Even more dangerous was the De Soto program, composed of patrols of U.S. Navy destroyers packed with electronics-interception gear that, during the early 1960s, deliberately provoked coastal defense radars in North Vietnam—a program that finally led to the fateful attack in 1964 on two De Soto destroyers in the Tonkin Gulf.

Why would these dangerous operations continue, even after ELINT and COMMINT functions were put aboard

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satellites? Because unlike photo reconnaissance, collecting electronic transmissions involves much more (and much heavier) equipment. The EC-121 American ELINT plane shot down by North Korea in 1969, for example, had a crew of 31 and *six tons* of eavesdropping equipment aboard; it will be quite some time before that amount of equipment can be miniaturized for use aboard satellites.

American intelligence has now surrounded its perceived enemies, notably the Soviet Union, with a vast electronic eavesdropping web whose size, complexity, and thoroughness remain unmatched in the history of espionage. Besides the satellites, there are 2,000 listening posts all around the world to eavesdrop on military communications, a half-dozen huge radar complexes to monitor missile tests, and a sprawling communications-interception operation in Cheltenham, England—run in conjunction with Canada and Great Britain—that picks up virtually all military communications in Eastern Europe. Additionally, the Americans are now deploying the very latest in COMMINT—robot electronic snoops planted at various sites inside the Soviet Union. About the size of a small handbag, the robots are unbelievably sophisticated electronic eavesdropping devices, capable of automatically gathering transmissions from superhigh frequencies being broadcast miles away, then encoding and transmitting them up to 300 miles to a passing plane or satellite.

(Although the robots are still highly secret in the United States, the Russians found out about them when one of the robots, carefully concealed inside an artificial tree stump, was sited in a forest near Moscow. The CIA agents who did the job made a serious mistake. They put the robot inside a fake pine-tree stump, which they placed in a grove of aspen trees. A pine tree in an aspen grove is very rare in the Soviet Union, and the robot inside was soon detected.)

All of this seems almost breathtaking: a huge clockwork operation of such ingeniousness, and one so airtight, that nothing could ever escape. And yet that is not what has happened; the supreme irony of modern American intelligence is the discovery by many of its practitioners that the more sophisticated the collection system, the more ambiguity in the resulting intelligence judgments there seems to be.

Consider what happened in late 1970, when U.S. photo-reconnaissance satellites detected the building of what appeared to be 80 new Soviet ICBM silos. That triggered an intelligence alarm, but three years passed while various components of the American intelligence community argued over its significance. Not until 1973 were the Russians asked formally about the silos—they responded that they were command and control silos, not missile emplacements—and it took until 1977 for the debate finally to be cleared up. (The Russians were telling the truth.)

Another shortcoming discovered in technical collection systems is their vulnerability to deception. The Soviets have been developing the art of concealment to a fine edge, and one entire factory in Czechoslovakia produces nothing but rubber MIGs, phony submarines, and other decoys, all designed to hoodwink American satellites and spy planes. The very precision of spy satellites—their tracks can be predicted exactly, allowing analysts to pinpoint what the sensors detect—is also a major disadvantage. The Russians know when the satellites are overhead and when they're on the other side of the world, allowing for a wide range of concealment activities when the satellites aren't around.

Even when the satellites are looking, there is some question whether they're detecting what they're supposed to detect. On September 22, 1979, for example, an American VELA satellite, scanning the southern Atlantic for any sign of a nuclear explosion, registered two intense bursts of light, the characteristic double pulse of an atomic detonation. The VELA sighting caused a sensation in the American intelligence community, but however conclusive intelligence analysts regarded the evidence to be—they were convinced that either Israel or South Africa had carried out a test of a nuclear-warhead missile—it was insufficient for the White House.

As President Carter noted, with some justification, the United States was not about to make the sensational charge that Israel, a close American ally, or South Africa had set off an atomic weapon. Not, that is, without having more conclusive evidence. Where was the fallout from the blast? Was there any confirmation from other intelligence sources? Could the intelligence agencies certify that no natural phenomenon—such as a meteor—was responsible for the flash the VELA detected? They could not.

And in that admission lay the crux of the problem, a problem that continues to bedevil American intelligence. At root, its great web of electronic and photographic snoops amounts to a collection of dumb machines, able to record, but not to think.

As we have learned the hard way, overreliance on such technology leads to confusion—much more than we ever dreamed. O+