



IS ANOTHER WORLD
WATCHING?
THE RIDDLE OF THE FLYING
SAUCERS

by Gerald Heard

A special edition, revised and with new material by the author

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FOREWORD

January 1953. What will history decide was the most epoch making event of the year? Our discovery of a lithium bomb? Our launching of an artificial satellite? Our synthesis of chlorophyll, when — as the sugars and starches will be made out of air, water and light — everyone would have enough to eat and starvation would become one of man's fading, bad-dream memories?

Any of these finds would be big, history changing news. But there is a bigger bet on the race cards, a darker and faster horse in the running. 1953 may be marked by the cracking of the saucer secret. Don't smile and throw the book aside. He laughs best who laughs last. Read this log of the strangest voyage that has ever been charted. Look through this list of certified sightings. See the way and order in which these reliable reports have been, year by year and month by month, accumulated and have convinced a steadily growing number of able, informed and specially equipped men. Then form your conclusions. No one likes to be laughed at as the man who kept his head in the sand, stuck fast in ridiculous ignorance, while every open minded person was alive to a new tremendous issue. For this story is quite without precedent. It is not mass hysteria. Quite the reverse. In this unique series of incidents,

gradually, by carefully established evidence, experts are coming to the conclusion that we are up against something inexplicable in terms of past experience.

So there we start. There are "unidentified aerial objects" cruising in our sky. That description must alert us. It is the official definition given now by the Air Force of the objects vulgarly named and still generally dismissed as saucers. This definition is cautious — as it should be. But it certainly vouches for the fact, known to every person who has studied the evidence, that these phenomena are actual. They are not a product of hallucination. So 1953 may well stand out as memorable in human history not because we made still another invention (whether beneficial or deadly) but because, for the first time, we faced a completely new and unprecedented situation. Up to this time man has not met his equal, still less his superior. This year he may be introduced to an intelligence surpassing his as far as he surpasses that of the chimpanzee. The introduction will need care. It may well require politeness, preparation, protocol. But surely it should interest us. For what bores us most? To have to be with people who never seem to grasp the situation and are always behind the times. What is most delightful? To be with minds of insight, information and brilliant ideas — minds which comprehend the maddening problems that have us stymied. And that in fact is what now seems promised to us.

We are alternately bored and alarmed at our own incompetence to manage the world mess in which we've landed ourselves. We keep hoping that some genius will turn up who can get us out. If you will study the brief story that follows you will see why the best informed authorities on the subject have come to the following conclusions: (i) We are in the presence of an intelligence, amazingly beyond ours, an intelligence possessed of powers which put it, her or him, so far beyond our reach that it (let us be neutral) can study us at will, can come close and yet easily elude our swiftest pursuit, (ii) That intelligence not only handles an unnumbered armada of curiously varied craft (some of enormous size, all of immense speed and inexplicable maneuverability). But it has disclosed two basic characteristics of high human intelligence. It has shown a constant curiosity and an equally balanced consideration. The objects have kept on observing us, but they have also kept their distance. If this is no more than wariness it does at least show that they are cannily human. But when we consider the powers they have displayed, surely they have shown an almost super-human restraint in not forcing themselves on us. Would we, had we been able to establish ourselves with such super powers in the air over another country, have proven so forbearing? Hardly. For, as the following record shows, they have been waiting aloft for years.

For generations quite good sightings of such high-sky craft have been made. Since June 1947 they have been coming "not as single spies but in battalions." What are they waiting for? If Christopher Columbus after crossing the Atlantic had remained year after year, cruising up and down the coast of the New World, his conduct could only have been accounted for by one of two reasons: — either he felt his forces to be too feeble to risk a landing, or he was too considerate to intrude until he was invited. These super admirals of the upper air have watched our skittering attempts at flight. Beside their sky mastery our aeronautics are the jumpings of grasshoppers. Their powering, as we shall see, would not only defend them from us, if they chose to stand and oppose us, but could prove a devastating power of offense. Go through the following account and see if you will not be forced to the conclusion, as startling as it is reassuring (an odd and happy conjunction of emotions), that they are waiting for us to invite them in. That is why 1953 may be mankind's most remarkable year. For this year we may be given a chance to decide whether we want to accelerate our education, advance our knowledge (in astronomy, in physics, and in engineering), and widen incomparably our frontier, which we thought we had closed. We might find that we had come to a new step in our evolution. Certainly that possibility grows increasingly probable. For the following account shows that these visitors are not only hanging on but increasing in numbers, in variety, in the width and the intensiveness of their inspection. All countries have sighted them. The Air Force collection of certified observations steadily grows. Not a week goes by but fresh, competent observers join the ranks of the coolly convinced. It is our duty then to know of this heightened tempo, this culmination. It is to bring this relevant information before the public — for only then can each of us with an open and informed mind decide the nature of the immense opportunity and what should be done about it — that the following outline of the story of this strange visitation is being reissued. The narrative has been brought

down to January, 1953.

CHAPTER ONE

How the Saga Started

TUESDAY, June 24, 1947, may prove to be one of the most important dates in history. Anyhow, it is the birthday of the oddest and indeed the biggest story that ever troubled news editors. And troubled is the right word. For most big stories are editors' delight. But this — this has proved a headache. For the fact is, it's been just a bit too big. It's true enough if human evidence, masses of it given by first-rate observers, is to be trusted. But then again, it just can't be! Why? Because if it is true then it's incredible!

But surely some sensible explanation can be found? That's the second and equally odd part of the story. As the evidence was good, editors and all sensible readers tried to squeeze back the facts into a common-sense explanation. But it was no use. Like the Geni once he got out of the bottle, this huge story wouldn't fit into any sensible theory. Editor after editor, science editors, aviation editors, editors-in-chief, all worked on the brute fact. They tried to get high-up people — Air Force authorities, presidents of aircraft companies, staff officers, the President of the United States. Would no one take this monster under his wing and say reassuringly, "It is really a new invention made by us, it is a secret weapon, it is an original space ship." But none of them would.

Why? Well, again no one is sure and your guess is as good as the next man's, provided you read all the accounts which so far have been published by reputable news agencies. So here is the story, here are the series of incidents, happenings, phenomena that have caused more trouble in the news than any historical mystery up to date.

On that Tuesday, June 24, 1947, Kenneth Arnold, aged 32, well-educated, a fine athlete, a successful businessman, was flying his own plane. He flies a lot. He has a business of his own, called the Great Western Fire Control Supply Company, and he handles, distributes and installs fire-fighting equipment through the Northwestern States of America. He's a good pilot, too. He visits his clients all over his big business territory, landing in meadows, etc. He lives at Boise, Idaho. He was returning there from the town of Chehalis, Washington. His next stop was to be at Yakima, also in Washington State. He made a detour, though. For flyers had been asked when flying in that district to keep a lookout. A large air transport carrying troops was suspected of having crashed near the southwest side of the snow mountain that stands up from the great Rockies range where it runs north and south through Washington State.

Mount Rainier was a dazzling sight that day. Arnold rose to nearly ten thousand feet and skirted the huge platform from which the peak itself rises. So he was able to scan the desolate giant gullies in any one of which he might see the wreckage of the lost plane. The weather was so good that the pilot could sit in his plane and give all his attention to the view. Then a flash caught his eye. He turned and looked in that direction.

Nine objects were flying like a line of geese and they were swerving in perfect formation in and out of the mountain peaks. Arnold thought they must be some twenty miles or more from him. For two minutes he watched them in their swift, closely co-ordinated flight, timing himself by his cockpit clock. He also estimated their speed by the rate at which they passed the landmarks — the snow peaks he knew. The pace was somewhere about 1,000 mph. The speed was of course high, very high, too high for 1947. The course the covey took over the peaks was not sane human flying. But it was the shape that stumped the observer. They were unlike any plane that he knew, They were disks, they were saucers.

Arnold talked about what he'd seen as soon as he was down. Flying men, having satisfied themselves that he hadn't been taken in by some mirage effect, told him he must have seen jet planes, some secret weapon of the Government — or of another Government. Then the news spread and the story began to find echoes. Till almost the beginning of July the papers were open to such reports. Then suddenly they were taken with shyness. "Mass hallucination" became the password. Such a widely

informed and open-minded authority as Waldemar Kaempffert, the long-standing Science Editor of the *New York Times*, gave that as his opinion. But the reports didn't stop, though now they had to be hunted out from small daily paper files, who found local interest counted for more than nation-wide ridicule. A United Press correspondent in Arnold's home town of Boise believed he saw disks in the sky and so did Johnson, News Editor of the *Daily Statesman* of the town. A United Air Lines plane going out of Boise, also before July was over, reported that the saucers had been seen.

Boise was evidently a good center for seeing. But though the Northwest seemed at first to be the favorite patrolling ground for these ceiling-cruisers, they were soon heard of from all over the West. The Arizona Republic, a paper which publishes in the big resort town of Phoenix, published two photographs taken by Dr. W. A. Rhodes of that city. They show, in the largest photo, a thing more like a black rubber heel with a small hole in the middle of it than a saucer. But it is certainly some sort of flying plane with the back of the heel acting as the prow.

That was on the ninth of July, but this story, with its photos and with the evidence of a number of witnesses who said the photos were of the object they had seen at that time, all this awoke no echoes in the rest of the press. The second of the very odd features of this oddest of stories had come, like the ghost of Hamlet's father, onto the stage. To the fact that something extremely strange had been seen, certainly been seen, was now added the extremely strange behavior of the information givers, the press and the air authorities. From here on these two factors are in play together through this baffling story. Something of the highest interest, the most pressing concern, has been seen, seen again and again, continuing to be seen and by most competent observers. And something which can't be seen, can't be tracked, keeps on keeping the subject out of the big papers, making out that people who see such things must be subject to "hallucinations."

The whole thing is uncannily like that other eerie subject, *Psychical Research*. There too we find the same baffling pattern. Researchers or observers say they have seen something very odd — they are convinced that they viewed some strange, inexplicable phenomena. All the authorities say, "Nonsense," and add, "No trained observer ever sees such things." Then a trained observer does see and tell. For example, ranking scientists such as Crookes, Lodge, Flammarion, great thinkers like Henri Bergson and William James, say they have investigated and found evidence. What happens? The vast mass of laboratory workers all reply, "Poor old men, going off their heads!" When Freud allowed that he had found evidence of Extra-sensory Perception, the same thing was said of him by some of his own lieutenants, "more royalist than the king."

The same thing happened with meteorites. Learned societies in the eighteenth century agreed that papers reporting such tilings mustn't be published. For the sky is not a blue vault off which pieces of the plaster flake and fall to the ground. Therefore meteorites aren't possible. "Why," asked Lavoisier, the great French savant, with the assured satire of the uninformed expert who knows all the answers to the questions he asks, "Why do intelligent, scientific persons never see meteorites?" And he answers. "Because of course a trained mind would immediately perceive that what was thought to be a meteor was only the vulgar misapprehension of an uneducated person."

A perfect example of this sort of thing is actually given in this Disk Dilemma by that last example mentioned just above — the case of the United Air Lines plane that was flying from Boise on the afternoon of July 4, 1947. Of all days in the year this is the one when most citizens are out of doors and a large number of them prepared for air displays. So when at Portland, Oregon, and Seattle, Washington, numbers of people saw disks flashing about high up in the sky — competent estimation gave the height as 40,000 feet — there was a fine mixture of comment: "The Government choosing the right day to show us we are all right" — "Some other Government looking in to see if any of the home team would like to do a bit of stratosphere racing?" — "Some sort of upper atmosphere oddity or firework display." Experts who didn't get a look naturally said there was really nothing to see.

One of them was Captain E. J. Smith of the United Air Lines ship leaving Boise. He didn't have to wait long. Close to sunset, right ahead of the plane obligingly appeared five "saucers." The Captain and his First Officer rang for the plane's stewardess. The three watched the five objects and when these had

allowed themselves to be observed for some minutes, four more joined the original five. This space-circus performed in front of the three observers for the best part of ten minutes and then disappeared. How far away they were and what their size none of the three could of course be sure. Naturally the three reported what they had seen. But they got no help. The Air Force and the Navy both said they had nothing of that sort on the earth, still less in the sky.

CHAPTER TWO

What Two Passenger-Plane Pilots Saw

YET it was clear that the various official sources of air information were not uninterested in the question whether they alone had the sky as their patrolling ground. As early as July 8 Muroc Flying Field Staff saw half a dozen saucers. This was group observation by trained observers. Hallucination should be spun of thinner stuff. Saucer reports could now be listed from forty of the forty-eight States — so the country had been well covered by the sky-saunterers. Again, Idaho had a good one — a disk that had swooped so low at Twin Falls that the treetops bowed to it. The Cascade Mountains in Oregon brought a companion piece. There a prospector for ores looking up saw five or six disks flashing in the sun. He was able to range his telescope on them while they played aloft for fifty seconds.

This was the day that Arnold made his first statement — June 24. But the prospector, by name Fred Johnson, hadn't then heard that. What made his private view doubly memorable for him was, however, due to the fact that he was wearing a compass. Glancing at it, he saw the needle in great agitation. This may seem a small thing. Nevertheless, throughout these reports we shall be coming across hints that the powering of the disks may be a form of energy of which today we have only the faintest speculative notion. We must be prepared to consider that some of these craft may be run by some type of magnetic power. They may command a force which permits them to resist the pull of gravity.

But before getting out into "such unsubstantial depths of ultimate power" let's summarize what now seemed presented to the common senses of so many and so widely scattered Americans. To the fact that disks had been seen so frequently flashing in the sun was now to be added their evident presence at night. And that was to lead to further information, if not instruction. The oddest thing about them so far was of course not their shape nor even their speed. There *could* be a disk plane — a giant quoit is a shape for which plane designers believe there's something to be said¹ — in the future. Further, their speed, though high, was not, by present standards, prohibitive. The first sighters estimated it at 1,000 mph. That's high of course — right over that speed of sound (up above the 700 mph level). And of course many theorist-experts said we'd never pass that limit. But in the autumn of that Disk Year, 1947, it leaked out that our own planes had reached supersonic speeds. No. the oddest fact about the Saucer Surprise was not something it had, but the thing it didn't have, the thing it mysteriously managed to do without — the old-fashioned human plane's most telltale feature, its torrent of "give-away" sound. The disks were dumb.

True, as the Phoenix flasher made a twist of a turn that would make any pilot "black-out" (there'll be more to report on that problem a little later), as that monster skid-whipped round like a salmon leaping at a fly, the photographer says he did hear a "swoosh"² But otherwise the thing tore its way along through

1. This shape has often been speculated on, - but it presents very serious obstacles to designers so long as we have only the present means of powering a plane. An independent inventor named Jonathan Caldwell, who worked by himself on this problem on a farm in Pennsylvania, did leave a large model of such a craft. Then he disappeared and has not been traced since. When the decayed model was found, some investigators thought that it might be the first sketch for the present disks. It is clear, however, that the inventor never brought his craft beyond the model stage and had not solved any of the real problems of disk flight. Nevertheless, many plane designers continue to work with the problems of such a "plane" and its "helicopter" propulsion.

2. Dr. Craig Hunter on March 16, 1950, sighted a disk which passed over him while he was driving on Route 153 between Penneld and Clearfield,

the atmosphere as silently as though it were a beam of searchlight darting through a cloud.

Typical of this behavior was a big flight viewed in the stillness of the late evening in the "Deep South" State of Louisiana. In perfect silence and yet at headlong speed across the sky ran scores of such objects, and they were luminous. So to their eerie silence was now added an eerie hue. Nearly all observers so far allowed that they gleamed like metal in the sunlight. But dusk brought to light this other odd feature and one probably as significant as — indeed probably linked up with — their silence: this strange glow. We may of course say of the observation made in Louisiana, and of this whole group of sightings, of which there are many, "But surely they *are* only a series of searchlight beams running through the upper air and glowing on faint streaks of cloud, otherwise invisible!"

It is then all the more important that at this point we come upon a new fact, a new step in the unfolding mystery. We now meet not only a new kind of evidence — unknown airships; yes, of a completely different pattern even than that of the disks, another "genus," unknown airships rushing headlong through the night and emitting lights as strange as their shape — but another fact to match it, a fact as firm as the first fact is unsettling.

Up till now we have had to depend on only two types of evidence: (i) That of people on the earth suddenly caught by surprise, not on the lookout, straining up to the sky and seeing for a few moments, at uncertain height, objects flashing and dancing — almost the worst type of observation even when the observers are trained to look for sky-travelers. It is amazing that any photos have been got. No wonder they tell us little.

(ii) The second type of evidence — from men actually up in planes — has more chance, for it is not from quite such a standpoint of disadvantage. But there again, as with the Arnold case and even with the Smith air liner observation, the lookers-on had to own they could not judge the distance or be very sure of the shape — Arnold thought the disks were twenty miles away. A ship twenty miles off need not fear much from naked eye inspection. What was most needed at this point was, then, observation made by a couple of trained flyers, trained of course to recognize aircraft, up in the air and (as even Captain E. J. Smith was not) abreast of their quarry, on the level with the object they observed and, if at all possible, really close to it.

All this was now to be granted. Captain C. S. Chiles, with his First Officer, J. B. Whitted, was flying a passenger plane up from Houston, Texas. The flight, which was a standard one, was to Atlanta, Georgia, and thence on to Boston, Massachusetts. The two officers were on the staff of Eastern Airlines Incorporated, and both had fine records in the war and equally good ones as careful and highly responsible pilots while they had been on civilian air service.

The plane left at 8:30 p.m. on July 23, 1948. At 2:45 a.m. there was a good moon coming through some broken cloud. It was onto this well-lit, quiet scene that suddenly a brilliant, super-giant torpedo dashed toward the Eastern Airlines ship. Both the flying officers saw it. It was coming straight down the air traffic lane they were on. But it was a bit above them. Then it suddenly swooped down. Captain Chiles swung his plane violently to the left. Fortunately the monster veered as sharply too, to the right, and they rushed past each other.

The pilots stared as the object flew past only some seven hundred feet away. It was close enough for them to see that it had no wings! About one hundred feet long, this cigar-shaped body was sinister enough. But its lighting seemed even more baleful. It had a fore-cabin or lookout port. So it was evidently a "manned" or inhabited object — or, to be still more cautious, let us say it seemed to need to see. But the light that came from the cabin surely would make anyone inside incapable of seeing anything outside even in the daylight, let alone at night. For this fore-port glared as though someone were burning magnesium flares inside.

Nor was that all. Right along the side of this fishlike monster that swam the air, all down its Pennsylvania. He could hear a "hissing whistle" as the object moved. As it was, he judged, only some four hundred feet above him and about a hundred feet in span, it would be expected that an object so close and large, and going, Dr. Hunter also estimated, at 60-70 mph, would by its air displacement cause such a sound. (See also later, Page 84, footnote.)

length as down the sides of some of those deep-sea monster-fishes that live in total dark, ran a vivid purplish band of glowing light. Thirdly, to complete its uncanny illuminations, there spouted from the back of the hull an orange flame which as it fanned out, spreading in a tail, turned into a more delicate yellow. Pretty, no doubt, but also more than a trifle alarming when seen so close. For this great fan of flame was half as long again as the hundred-foot craft that spouted it. A lifelike, if not a human, touch was given by two rows of windows. But in the moment that they flashed by, the two pilots did not see any faces pressed against the panes watching them as they, two astounded humans, watched this outrage on common sense as well as common security.

But some guiding intelligence, and one not unaware of peril and indeed wishful to avoid disaster, was in control of this great shaft of speeding force. And "he" was as skillful as he was — if a little late in the day — considerate. His way of showing it nevertheless did not cease to be alarming, indeed became increasingly so. This flukeless black whale of the upper air suddenly doubled its really awful fantail of flame. This gave the whole craft a kick as though shot from a gun and the entire ship shot up like an arrow and plunged into the clouds above.

The pilots hadn't merely to trust their four eyes for this maneuver. Seeing is believing, but feeling is knowing. As their momentary and very unsettling companion took his leave, his leap into the upper sky gave such a "wash" to the air that the passenger plane reacted with a very confirmatory and at the same time very unsettling rockover. Captain Chiles rightly at once went into the passenger part of the ship, leaving his second officer to fly the craft. He must find out if anyone else saw what they had seen. Of course it was the dead hour of the night, 2:45 a.m. But one passenger, a Mr. McKelvie, did see the light rush past close to them. And he did note that it was a light unlike any light he had ever seen — not lightning nor the friendly lights of earth.

Tracking the story — which had a big press for the moment — it was found that about 2:00 a.m. that night air observers at the flying field of the city of Macon in Georgia had seen rushing overhead a long, dark, wingless tube that evidently hurled itself along by means of the huge flame that spouted from the stern. The Navy authorities suggested (as their contribution to the discussion, "What in heaven's name was that?"), well, it might be one of the super-rockets which everyone knew were being experimented with in New Mexico (and which have a chapter to themselves later on in this flying disk saga). But could a rocket that had strayed wander over so much of the United States on its own? And surely even the most efficiently self-guided missile could hardly prove as obligingly considerate, and willing and able to yield right of way, as this super-torpedo had shown itself to be?

What we can ask, with more chance of getting an answer, is: Had any report of any sort come to hand of this "new" type of unknown flyer — a non-disk? The answer to that is, Yes. A big wingless shaft of a thing, like a log in a stream, plunged across the traffic lane being followed at Bethel, Alabama, by two airmen working for a local flying service. But this seemed to have no glow and not even a wake. The two men tried to follow but of course it outpaced them — they were trotting along at under 200 mph. That was in August, 1947, quite at the start of the excitement. And to start 1948 well, on the first of January a "ship" of the same noncommittal cut, showed up over the other Southern State of Mississippi. Again a couple of flyers saw it from their plane and tried to follow. But just by doubling its pace, almost at a bound, as usual it escaped giving nothing away. But this time people on the ground saw it too.

Fortunately, at this point, too, we get something like what opticians call "binocular vision" — that is to say, we get a report from far outside the United States from skilled observers, well placed to view and in daylight. On April 8, 1948, there was reported in Manila by Lieutenant R. W. Meyers of the 18th Fighter Group, Philippines, leading a group of four planes, that they sighted and kept in view for five seconds a silver-colored "aerial object." And in that small space of time it did indicate its inhuman character by making (one of these machines' most peculiar powers) a ninety-degree turn before it shot from view.

But in all this confusion of really too much evidence — so confusing because of its richness — we can begin to sort out the findings. First and foremost, we can be sure that while there may be many different kinds of disks — different species, as biologists would say, different species of one genus, the

saucer — there is also riding the upper air — yes, and perhaps riding above and beyond the upper air — another "genus," this long straight tube of a thing.

That raises a further question: "Can we stop at two? If two, why not three and more?" As H. G. Wells used to remark when people tried to use the "shut-down" of the "either-or" argument, "The Mind of the Universe can count above two." That further question has an answer, and as Parliamentary language has it, "In the affirmative" — but, alas, that does not mean that this answer has proved reassuring to anyone. Quite the reverse. And with that question (for as a matter of fact they are linked together) we may raise the other question which we naturally have all been asking: "Surely someone could grapple with this kind of trespasser? We no longer have to stand on the ground, rooted by gravity, and gaze helplessly at the heavens. We can go up and scour the sky day and night. With the number, speed and height-scaling power of our modern planes we can get through the clouds and see all over our globe."

It is precisely because someone did try to grapple with one of these "things," it is precisely because the "thing" he tried to grapple with was still odder, more monstrous than either of the other two thus far sighted, that tragedy for the first time stepped into the story. What had been odd and only possibly sinister became grim.

CHAPTER THREE

The Tragic Chase

THE New Year of 1948 was only a week old — the second year of the Disk Era — when death took his first toll. Before, however, that sad and baffling tale is plotted out, let us remember one thing of great importance. These "trespassers" — if we should so call them — have been meticulously careful "to observe the amenities." They have always kept their distance, kept out of the way and when they have found that they have strayed onto our unmarked air traffic lanes have at once cleared off. They may have been observing us — or even may be interested in something other than us — but certainly they have not pressed their curiosity to any impertinent lengths. There is no evidence that they have ever made any motion toward landing. Though one or two not very good reports say they did come near the ground, they certainly took care to do so when no one was about who might object. We must repeat, they have always tried to get out of the way.

For it is of the utmost importance we should never forget that. And it is of the utmost importance that we should remember that fact when we are reading this chapter. For terrible as the encounter proved, the "encountered," the visitor, did everything, within its remarkable powers, to avoid a contact, to keep clear of complications. Though as terrible a monster as any the human eye has ever rested on, it ran like a hare away from the rash man who pursued it. That being clear beyond a doubt, now we must have the story.

It is also clear beyond a doubt that the authorities were uneasy. Of course they were or they would be unfit to be authorities. They were caught between two concerns, two acute anxieties. The first thing was of course. "What the Devil is this?" No one is inspired today and everyone knows it. Today the more informed you are, the better you know that your best and brightest guess peers over the edge of a blank, black abyss, out of which no one knows what next will emerge.

The second concern that a lively authority in this up-to-date, going-to-pieces world knows is that no one knows what the public will stand. What if the wildest fear proved true? What if the last thing we are clinging to in the back of our minds — that (though God and inspired prophets and infallible authorities are all put by public opinion under a cloud) at least Man is the one thing that matters, at least we are the one person who can think and act and direct our fate — what if that is untrue? What if there are other creatures as clever, yes, much more clever than we? Now, would the public — the democratic, "I am the crown of creation and the master of my destiny," present-day public — stand for that view being squashed, flattened? Again nobody knows; and that question, of course, is second to none to a democratic politician.

So the authorities have been uneasy and have tried, like all uneasy people in control, to keep a

straight face and say - as little as possible. But they had to find out. It was on the seventh of January, 1948, that the New Year brought as a present the possibility of finding out. And the offer was a big one — the biggest ever up to date.

Fort Knox in Kentucky (famous throughout the world as the place where the vastest heap of gold ever accumulated in the history of man used to be kept buried) was chosen as the center of the scene of action — and tragedy. This was to be no case where somewhere off the track, over some quiet countryside, in the night, a couple or maybe one observer saw something for a few moments. No, it was to be (as far as the word "showing" means showing something) a showdown. It was just getting on for three in the afternoon — the time when the light is still very good and men fresh and alert. The State Police had been the first to give the warning about half-past two. Certainly scores of people had already reported seeing something that made the State Police call to the Military Police as a matter of immediate need.

A very big object that shone brightly in the afternoon light was traveling through the sky at a vast speed. And it was evidently making its way toward a big Air Force Field, the Goodman Base. The Air Field was then on the alert. And those on watch didn't have to wait long. The Goodman Field tower was manned with its leading personnel. The Commanding Officer, Colonel Hix, was in control there. He was using his binoculars and they had found their mark. The clouds were broken. Through them had appeared something which made the warnings sent ahead seem anything but exaggerated. The clouds thinned and the whole group of expert and responsible people — as competent a bunch as could be found in all the world — the entire team, saw. It was huge. The size must be estimated. There wasn't much doubt about it — only that it couldn't be! But any estimate which was made by ordinary checking seemed to show that it must be, say at the least, five hundred feet across! What there was no doubt about (and this was a new saucer style) — it shot out in the daylight pulses or blasts of red flame.

But the group in the tower weren't, of course, just going to stand and gape and hope the clouds would clear off and the "thing" oblige by standing still. It was clearly going its own sweet way at its own strong gallop. So, not expecting otherwise, the Command had made ready. Three fighting planes were already up and racing every moment higher to come up with the intruder. Nor had the command to wait.

One of the most wonderful features of modern flying, and what has made for so much of its security, is that the ground controls and commands and the ships in the sky can keep in constant touch, in instant exchange, with each other. And now the scouts hidden high above the clouds began to speak clearly to the whole group in the tower. At least the man in command of the scout fleet of three was now speaking. That was Captain James Mantell.

His report was good insofar as it was not disappointing. But it was grim too. Yes, he had the quarry in view. He was on its tracks. And there had been no exaggeration. It was of "tremendous size." It looked, too, as though it were metallic.

Then the voice from the far-up plane went on. "The thing is climbing." The next phrase was hopeful. "It's going only half the speed of the pursuit." Yes, he'd try to close in. But after five minutes when the loudspeaker again took up its tale it was not so certain. The monster had evidently taken fright. It had shown its mettle — it was now climbing at close on 400 mph.

When the speaker again addressed the tower group the voice was from one of Mantell's companions. Both he and his fellow plane had seen the object. But they had lost sight of it now and of Mantell. For he had gone on up after it and had disappeared in still higher clouds.

At last, at quarter past three, Mantell's voice was heard again. He was holding on and up. But the thing was still rising above him and maybe increasing the gap between them. Still he'd track it as far as he could go — he thought he could stand up to 20,000 altitude. Then if that didn't bring him at least to a better view and closer up, he'd give over.

Probably he did. No one knows for certain. What did show up was dumb, dead dumb. The wreckage of his plane was picked up over a wide area. How he actually met his death no one could say for sure — but dead he was. When his voice could no longer be got on the loudspeaker, the Command ordered one of his companions to search upward. Taking oxygen apparatus, he not only went to 33,000

feet, he swung over hundreds of miles of skyscape. But there was not a glimmer of the immense thing they had all seen rolling above them.

Fort Knox made a release on the subject. The Commander, Colonel Hix, was allowed to have watched the visitor, which was said to be "unidentified," and Captain Mantell was declared as killed while chasing it. "The rest," as a famous and inconclusive play concludes by saying, "is silence." But there was a rumor that at Columbus, Ohio, at the airfield there, as the sun was setting on that fatal day, a disk rushed overhead and that this disk had a big flaming flue-blast trailing out behind it.

So the tragic chase closed with the first saucer casualty. The sacrifice made by the gallant pioneer didn't add to our knowledge anything more than might have been gleaned from the ground. The observations from the tower showed that it was a new species and maybe a new genus of this strange visitation. Before, no disk of that size had been noted — though some may have been as big, but too high to be gauged. But what none before had shown was this great flare of angry incandescence from the stern.

And still there were more to come — to make the whole problem more of a headache — more facts to make the whole thing more incredible, less able to be fitted into any, even the most unpleasant of, human explanations. Further, as we shall see in the next chapter, with unabated courage, pilots were ready to try and tackle and maybe intercept one of these uninvited visitors.

CHAPTER FOUR

The Phantom Hunt

IT WAS now October 1, 1948. Year Two of the Disks had been full of inconclusive evidence, some hoaxes, a lot of mistaken sightings — weather balloons etc. — a lot certainly pointing to something — but to what, to what definite conclusion? No one could say. No one very much wanted to say. For if it was a secret weapon, why, then no one wanted to talk about what might be spoilt by talking. If it was "another Power," there again no one wanted panic started. And if it was something not human at all — why, then least of all did anyone want to talk!

People like new things provided they're nice things — and the word "nice" means that they must fit in with what I like and not upset my life. No one could help feeling that something so outside our ordinary ways must, at the best, be very unsettling. Our society aims at comfort. Our research is to add to the comfort and pleasure of life. No one could imagine how the disks — the farther off one had to put their base — could in any way add to our comfort — quite the reverse!

All the more then must those who had to know — the Defense Forces — know. And knowledge kept on coming down from the skies, as the poet says, but, as he added, wisdom, the power to make sense of the whole thing, that, as usual, sadly lingered. But the case that follows, though it is so important and puzzling, did not, thank heaven, end in tragedy, only in further bewilderment.

The evening of that first October day had already settled in. Indeed it was now night over the North Dakota town of Fargo. A National Air Guard Lieutenant named George Gorman, a man of some importance in the city, was coming in from a practice flight in a fighter. He was the last of his group and had just received the O.K. that it was clear and safe for him to land. But looking below his craft, he saw, moving very fast, a light between him and the ground.

It was moving at an unwise speed considering how close he judged it to be to the earth, for he took it to be the hind light of a plane. Naturally he told the landing control below to make sure again all was clear. They told him there was only one other plane in the district, and, as it happened, he could pick up its outline — well out of his way. And more; this plane that the tower accounted for was nowhere near the patrolling light. Further, as the light circled about until it was between Gorman and a lighted ground area, Gorman saw no body, no structure of any sort round the light — there was just a flame without a holder, a moving light without anything to move it, or carry it. And now the tower control man caught sight of the light. He had, of course, night binoculars — so he could see far better than Gorman. But like Gorman he could see just the light and nothing round it.

Then Gorman decided on a bold thing. He was above the light. So he swooped on it. And that apparently caught its wandering attention. It paused and then, quick as a toreador with a charging bull, side-stepped. As Gorman swooped past, he could see it as it slipped off to his right. It was only a foot or so in size, a white globe. Gorman thought it was making for the tower, so he dived at it again.

For twenty minutes this skillful flyer dived and ducked at this queer enigmatic opponent — an opponent who certainly knew how to play the game and who in boxing terms could show some pretty footwork. They danced this night sky duet above the airfield. But some of the turns made by the light as leader were so sharp and neat that they made Gorman go as black in his consciousness as the night outside. This touch and touch again of the grim danger of blacking-out made Gorman think fast. The thing was behaving humanly, one might even say humorously, but could it be human and flick round corners and make turns like that? Could any human brain stand such spinning and sudden twisting?

That problem of whether humans can turn as quickly as disks turn, is going to rise again. We had best then note it well now. For certainly a lot may well depend on it, on that one queer fact. The facts of human anatomy are stubborn things. We weren't meant to function above a certain rate and pressure and power of spin. Go over that limit and you'll be lucky, very lucky, if you don't find yourself laid out — and perhaps for good.

But when at last it seemed for a moment as though Gorman might by a quick stroke actually get in its path, it seemed to lose patience. With its usual unexpected readiness it suddenly swung. But not away — straight on to Gorman. The two, he and the light, were now diving right into each other. Gorman then did dip and the light sailed over him. Perhaps that counted as a point to it. Gorman thought, however, that he must make another dash for it. Again they came head on. But this time — as it must be owned the disks always seem to do — it took to its good manners and used its full powers — it just hopped right up into the air, as the old Cretan bullfighters used to leap right over the charging bull.

But Gorman wouldn't let it go. By that time, however, the Thinking Light had tired of playing ball with its rather clumsy human pickup. He came on panting up behind it. But it, light as Ariel, rushed up to 14,000 feet, and then (after Gorman's plane had coughed but got its wind again and taken him to 17,000 feet) the Light shook itself free of its heavy hanger-on, sailed up into the night and was gone.

This unequalled joint performance of man and mystery, flame and fighter plane, was watched by quite an audience. To the two men in the tower were added another couple who had just arrived by plane. This moving body — if it can be called a body — had no trail. And no one heard any sound come from it.

What we can say is that we may be thankful that the brush with the Light did not end as had ended the only other close-up with someone or something coming from above. There, as we have seen, the poor earth-aspirant repeated that very first story of flying, where the rash young Icarus, son of Daedalus, the first inventor of wings for man, flew, against his father's orders, too high; his wings disintegrated and he fell to be drowned in the sea which the Greeks named after him and his disastrous exploit.

For surely it is an absurd, an unscientific approach to anything in the air, to try and run up to it, still less to try and run it down! What is the sense of sending up "fighters" (planes meant just to down an opponent who otherwise will down you), as in the first tragic case, to tackle a monster of utterly unknown powers and speeds and of a size so enormous — some said it was nearer a thousand than five hundred feet across — that its very wash might throw to the earth any planes?

And in the second case, which we can fortunately call comic, must we not say it was even more ridiculous for one of our fighter planes to try and tackle a light? What can a tiger do about a beam of deadly X rays? His defense and attack are not in the same world as short-wave radiation. It can kill him without his knowing it. He can do nothing to it. His one chance is to give it a wide berth — unless he can track its source and break up the "tube" that is emitting it. There, though, lies a clue, or a possible one, in this last case, of the Light Chase, the Phantom Hunt.

One thing will strike anyone who reads this report, or at least one question must arise: Surely that Light was being "projected"? There must have been — if the whole thing wasn't a Phantom Hunt but a factual hunt — someone, high, high aloft, who was directing this little bright "bait," directing it on the

flying field of Fargo, North Dakota, to see what the men-minnows in the bottom of the earth-atmosphere pool would do. The "person" far, far above played with the one "minnow" that rose. But — and this is vitally important — though the "minnow," like any other mindless minnow, dashed at the bait and tried to capture it, the high, hidden "fisherman" was, thank heaven, much more a patient naturalist than a sportsman wanting to land a catch. He played with the poor little creature which was only able to swim as high as the water of its pool extended (and so at 17,000 feet could be let slide back to mud-level). He took care to learn as much as he could of the "minnow's" power not only of maneuver but of mind — tested to see what turns it could take, of what tactics it was capable, what its resistance to strain, what its inventiveness to sudden movement might be.

There is, then, no escaping the conclusion not merely (as all who were in on that play agreed) that there was an intelligence guiding that Light. That is interesting, if perhaps a little too much so. What is not only interesting but heartening is that that intelligence showed itself considerate — it wanted to learn about us and it was not only clever in the way it did so, but considerate.

As to the tragic Mantell case — again what else could be expected? This huge thing, this monstrous sky-master, scuttled away from the silly gnat that kept on rushing after it. The two other flyers (sent up in fighters) the huge space-ship succeeded in shaking off without doing the frail little gnats a pennyworth of harm. No one knows how near Mantell got. The current explanation is that, as he hadn't oxygen with him, above 20,000 he "blacked-out" (as was to be expected), and that, while he was in swoon, his plane got out of control. A crash from that height from th^o' cause will do all to the victim and his plane that the account of that plane's breakup bore out.

But Mantell may have got right into the danger zone — and by that is meant, near the wash of this terrible thing's inconceivable engines. We shall find that question with us from now on to the end of this enquiry. The next chapter gets down to it — or up to it. And Chapter Ten tries to collect and order all the deductions so far made.

They do seem to point to one thing — these "ships" are quite as peculiar in their power as in their shape. They do command some sort of prodigious energy the like of which is just under the horizon of our speculation. Now if a silly boy is rash enough to swim near the screws of a great ocean liner when they begin to turn, he will certainly be sucked down and drowned. The captain of the liner can't help that — you must keep clear of that wash and suck.

There are already at hand two reports from observers who say they watched disks flying over a forest on a still day, and what struck them most was that the tops of the trees as the disks passed high above them twisted and lashed as though a small typhoon were passing over them. Finally, there was a report that Mantell's plane fragments did show signs of such "handling." There were grooves in the metal, driven right through it. "Machine-gun fire"? But what in the name of the unknown would a space-ship of that size be doing "manned" with such archaic harquebuses as machine guns? Does a modern battleship, powered with turbines and dynamos, arm itself with bows and arrows and so beat off attack?

No. Taking for granted the size and power of this the greatest of all the sky-visitors yet viewed (with any accuracy), we can only conclude one thing. These searchers and explorers from the sky are considerate — indeed, there is every reason to suppose that they are as wise as they are clever, as gentle as they are ingenious. In this case they were escaping so fast that they thought they had left the "gnats" safely behind. Then one got close enough to be hit by that intense "wake" of discharging atom-force, radiation energy, needed to drive this artificial island up into the airless sky, out into space maybe, The rods of force, the jets of energy flashing out from that stern would be more penetrating than any bullet, than any jet from an oxyacetylene torch, which drives its darting tongue of flame through steel as though through butter. The accident would be hopelessly unavoidable — the kind of pathetic mischance when a poor wild animal steps on a five wire and is instantaneously killed.

Such then are the conclusions, the only reasonable conclusions, with which the evidence leaves us — evidence which we cannot set aside or brush away. But something hopeful, something constructive, comes out of these two key reports. First and foremost, we need not, we must not, become panicky. The visitors have behaved with wonderful, high-grade consideration and correctitude. Think how you would

plan to conduct yourself with the utmost decorum if you were visiting another world — or another country with which you found it hard to communicate by words. You could not find a sounder approach than that which these strangers have made toward us. We can then watch and wait and, above all, not be belligerent toward those who have shown no abruptness with us. We can conclude that the fighter-plane approach is both silly — for it was quite impractical — and dangerous — for surely it would be hard not to misunderstand it. If every time I go into a field, a bull charges me, I may be forgiven for assuming that he does not want to be on friendly relations with me, or even to study impartially my behavior and habits.

But what can we do? Are we simply to wait sitting on the ground, dumb and mainly blind? No one likes being looked down on and being spied upon by someone above, least of all the creature that has just learnt to fly. That is why the next reports are so important. For they carry us a step further — not merely do they give us more evidence about the disks; they show us a new approach to them.

CHAPTER FIVE

The Rocket Outraced

FOR now the time had come when the ground began to gain on the air. Up to this point we all thought, Well you must get abreast of the Things, on the level with them. That, we see, proved harder and harder until we have to face the conclusion that it is impossible, as well as quite possibly very dangerous. The old instruction for over-curious little boys being taken round a power house, comes to mind: "Look but don't touch!"

And, as it happens, the ground has one great advantage over the air. From the ground we can make more accurate observations than from a plane. The theodolite allows for that, A common instrument, an essential part of every crew of surveyors, with its telescope and its equipment for reading off heights of objects and their computed distance, it is just what every disk sighter would like to have his eye to when one of them crosses the sky. And quite early in this six-year hunt of the sky it befell that a surveyor team equipped with their theodolite, set up and ranged, got their big chance. It was again at Boise, Idaho, where the hunt had started in June, 1947, that on February 20, 1948, the Idaho Power Company was employing a crew. They were actually working at a small place called Emmett, and it was to the paper, the *Emmett Messenger*, that Mr. E. G. Hall — who made the theodolite observation — gave his account. He was standing ready when one of his colleagues pointed out to him a sky object. Hall ranged on it. He got it, but had the greatest difficulty in keeping it in the field of vision because of the object's speed.

Still the following facts he felt sure of: Its height was only some four thousand feet, its size he judged to be that of a smallish plane. Along its back edge there was no trail of fume. *But* there was a "fuzziness, like whipped cream." (Now that is important, for it would seem to show some form of energy which, escaping into our atmosphere, vaporizes in a peculiar way.) It was gleaming white. Sound? "It was as silent as a gull." As it got near a hill, the onlookers — for there were two other companions viewing it — expected it to go over a cloud bank, measured as being some two thousand feet high. But the disk chose to go under. So it must have been very silent not to have been heard when rushing headlong so near the ground. A number of other people saw it. The time was ideal, just after 1:00 p.m. So this is the first known, gauged, theodolite-measured "viewing." This is the first time that a trained eye using a "transit" was able to scan a "visitor." Mr. Hall maintains that he saw no cockpit nor engine mounts. It was as noncommittal as a white plate flung quoitwise through the sky, and as silent, in spite of its rush, as the still grave.

We had to wait for another year — to be exact, fourteen months — before we got another theodolite ranged with its observer on another disk. This is not to be wondered at. The chances cannot be very good or high. Probably not more than four hundred sightings all told have been made of disks — though some reliable people who have tried to make that sort of checkup think that it's nearer eight hundred, or twice as high. But for things that show up for a matter of seconds, in far the greater number of cases, what else could be expected? Even time to get a camera is seldom allowed. But, as it happened,

when the chance came in April, 1949, it was splendid. If anyone had asked, he couldn't have been given a more perfect setup. Perfect observation conditions, perfect crew and lastly a perfect performance by the observed — by the disks themselves.

Take the observation conditions first, for they are basic. Of one thing we can have no doubt. These "things" usually fly very high, very high indeed, and at very high speeds. So if the weather conditions are not of the best what chance has one of making anything like a satisfactory observation? Anyone can test that for himself. Look out when next you hear a plane. Most of the time it is only a sound and very often it stays that — till it dies into the distance. And these "things" very, very seldom make a sound. So first and foremost you must have an area of very fine weather. That means a desert, where thin, dry air is the rule and a hard blue sky, deep blue, is the day-by-day "ceiling." That is why the desert is chosen for upper-air observations.

When after the war the captured German super-rockets were found and brought to the United States for testing, there was clearly only one place to choose for this testing — the great Southwest Desert of America that stretches through New Mexico and the other arid States of Arizona and Nevada. There, safely, had been kept and tried out the terrible secret of the A-Bomb. Besides, in that wilderness there are so few people, so scanty an occupation, that it is safe to throw things into the sky and let them fall back, without risking the life or limb of district dwellers. So the crews to send off and to watch these super-rockets were sent to a place that has been much written up — White Sands, New Mexico.

The results, too, we know have been remarkable. We have learnt much about the upper atmosphere, much that was very strange. "Air" from up there has been captured and brought down bottled. There is not room here to go into the remarkable finds that have been made. The rockets have penetrated out into heights, up into rarities of our atmosphere where no instrument of man had gone, and brought back masses of fascinating information. But, nevertheless, the most remarkable thing that has as yet come to hand was not part of the research "project." It came of its own will; it came (there seems no possible doubt) because, being highly intelligent too, "it" thought it too might look on and study with us — and study us, and our study tools.

Commander R. B. McLaughlin is an expert. All his professional life he has been specializing in missile study. That led of course to work on guided missiles, rockets, etc. Finally, in 1946, he was put in charge of the division of research at this Rocket Ground that was covered by the Navy. One of the crews of observers for whom he was jointly responsible was out on a day of usually good observation conditions, in the month of April. They were working nearly sixty miles away from the actual Rocket Ground. For they were watching with theodolite and other scientific checks a weather balloon they had sent up. But the theodolite man of the crew got his attention sidetracked. Naturally. The rest had seen "it," crossing by the balloon. It was a "standard" disk — there could be no doubt — a "moderate" model, i.e., about a hundred feet across. But there its moderation ended, sharply. For it was nearly sixty miles up! And its speed was even worse — some eighteen thousand miles an hour! But its power of acceleration was the real "headache." For when it had made its pass at the balloon, a gesture common with the species, it made a dart up — to its native level? Whether that was its aim or not, of the speed at which it made this sudden kick up, there could not be a doubt. It would be exerting, the experts agreed, a pressure on any one inside equal to the pressure of gravity increased twenty times!!!

We shall be coming across that difficulty — or insight — as to what can be inside these disks again and again. For it is crucial. No man could stand it for a moment. That jerk, that sudden increase of pressure, would literally press us to death. Only insects could stand being suddenly compressed like this — that is, the inertia of their bodies suddenly made to meet the battering-ram impact of the walls they are against or the floor they are on, suddenly boosting them ahead.

The team had a full minute to watch it. That gives trained men with their instruments quite a long while to see and to reflect. Then the white discus high up in the deep blue did the usual disappearance act. It was gone. Incidentally, the flat, disk shape of the machines may account for their sudden disappearance. They turn edge on, and so they are lost in a flick. After all, the rings of Saturn (which are an obvious feature for every amateur astronomer to find for himself) were lost again and again by their first

finders (See also later, Chapter Thirteen). For the rings are actually so thin (though so striking when seen "full face") that they have only lately, with modern telescopes, been picked up when their edges are pointed at us. But the Navy chief on the spot, McLaughlin himself, had not been there. He trusted his team. But he himself hadn't seen. And we all know the difference that makes.

But a month later the disks saw that this oversight on their part was repaired. This time the Commander was "viewing." A rocket had just been sent up, and he and another officer were standing gazing up to where it had just disappeared from ordinary sight as it rushed toward the limits of the atmosphere. Then the officer pointed out to the Commander what he took to be the rocket coming home. They both saw it, as did another officer too. But it was white and going at far too easy a pace for a homing projectile. It began to mend its pace, passed over their heads, and with dismay the lookers-on thought it was going to come to earth far too close to one of the few ranch houses in that desolate area. And then it changed its mind, put on a prodigious burst of speed and was lost behind some hills. They still thought it was their missile, and the Commander got at once on the telephone to warn the senders that he was sure their sendup had strayed and was going to pay a very unwelcome visit to someone who, being outside the range, ought to have been safe from that form of molestation. However, the information was hardly passed on before it was denied — denied by the reassurance given by the big bump they all heard, the bump that signals that a rocket has come down safely in its allotted ground.

So the thing that the Commander and his colleagues had viewed must have been — what? The only answer seemed to be, "A disk," and one up to its usual dance. There was the "saunter," the stroll, say at about twenty or thirty miles high. There was the fabulous — and to any man on board such a craft, to anything larger than a mouse, the fatal — burst of acceleration. Yet, with all that, there was no evidence that the burst of speed led to a burst of gas, a trail to mark the increase of kick. No; as with the disks of this sort, the object suddenly shot like a thing out of a gun but gave not a clue as to what drove it to such a breakaway.

So when one month later, in June, the disks looked in again at the Testing Ground, though again it was a team and not the Navy Commander who saw it, he felt even less than at the first sighting that he could dismiss the evidence brought him. The first upper-air missile had been a job of the Army's. This one, sent up on that June day, was a Navy job for the Commander's own division of the Forces. And this upper-atmosphere missile was not let disappear before two "Sky Inspectors" arrived. No one saw them arrive. The observers simply found that a brace of disks — or at least platters — had appeared alongside, and what is stranger still, were now running up alongside the climbing missile. Perhaps they were the smallest ever seen. They were thought to be less than two feet across. Then one dashed through the wake of the rocket and came out beside its companion on the other side. Still stranger, now they were together, they started racing each other. And they made such speed that they left the rocket behind them, going up and away — the usual exit. Nor did the Commander have to rest with the evidence of this one team alone. From nearly a dozen of the lookout posts which are placed at distances round the huge field, miles in length, to keep posted as to where a stray missile may fall — from one after another came the telephone reports: the twins had been viewed in their amazing, and till then unprecedented, flight.

CHAPTER SIX

Are They Only Seen in America?

THAT is one of the commonest questions of the skeptics. It is a way of suggesting that as all reports come from America, the evidence can only show two alternatives: either America is making the craft, or Americans alone have the gusto to enjoy a super hoax. All other nations lack both the know-how and the humor. For if we aren't making these super sky cruisers and they are really up there traveling at these unprecedented speeds, then of course they would be seen in other parts of the world. The answer to that question is quite simple. They are being seen constantly all over the world.

Up to this point we have only been examining the most significant sightings of the first three years of this invasion. And it is true that from the summer of 1947 to the summer of 1950 the best crop of well

authenticated reports did come from the United States. There were a number of viewings from Mexico but this evidence was generally not of "air pilot" quality. But by the fall of 1950 the rest of the world began to give tongue in this queer chase. Let us take first the other big English speaking country — Great Britain.

From the press records and from competent correspondents it is quite clear that as the fall came on, Britain began to experience a thorough inspection which equaled in intensity any saucer visitation to any part of the United States. Further, we can say that the inspection, thorough as it appears, must have been far more intense than the records show. For in that island which is the home of cloud and fog, and at the season of mists, only a small percentage of the actual lookers-in can have been noticed. But sufficient observations were made by good witnesses for us to be sure that the whole island was subjected to a sweeping study which was carried on for a number of months. Still further, and even more important to us, these sightings have added considerably to our knowledge of the craft, their speed and handling, their types and their behavior. The viewings were so numerous that in this necessarily brief summary we shall choose only those which enlarge our information: those which fill out hints already dropped to us by our sky visitors, and also those which add completely new facts about their powers and forms. The first striking sightings did confirm those initial American cases given in the preliminary chapters. And in two important respects: as to the speed and as to the nature of these projectiles. For there is hardly a better or more consistent set of observations than those made of an object which swept in from the Atlantic one night and cruised over the greater part of southwest England. That the visit should have been by night is, of course, the first matter of interest. The object was visible because it was brightly luminous. Observers in south Pembrokeshire first sighted it at the extreme end of the big Severn estuary's west-pointing mouth. Then successively, all along the south Wales coast, watchers reported it rushing eastward. When it reached the estuary's end at Bristol, it was tracked as it swung for a few minutes toward the north, then it veered south and, sweeping over Somerset and Dorset, flew away over the English Channel toward France. Such a series of connected observations left no doubt that the craft was intensely luminous, of tremendous speed and was cruising on a course of selected inspection. The path it followed was certainly not that of any meteorite. The witnesses also added the further testimony which confirms the specifically puzzling nature of these "unidentified aerial objects." They glare, they rush. But they hardly ever give a hint of sound. This silence, attending such blaze and speed, as already remarked, certainly increases their eerie interest. For it would seem to indicate two possibilities: (i) either they are flying so high (at least 25,000 feet) that their sound fades before it reaches us. (ii) Or their method of propulsion is such and so odd that by some unknown means they can part the air, not disturb the molecules, and thus propagate no sound.

Shortly after this sighting, watchers on the opposite coast — on the east side of England at Whitby in Yorkshire — looking out to sea saw disks approaching from a clear sky and passing high overhead. Meanwhile all over the country, observers, long and strenuously trained to spot and recognize planes, saw — both by night and day — flying disks. At night they emitted a blue-white glare. By day they generally appeared like gleaming silver.

The most remarkable disk sighting however, was again over a western estuary: the other of the two large inlets which pierce the west British coast — the Solway Firth that separates England from Scotland. On a fine, still day three builders employed on a housing project at Annan, a place on the Scottish side of the tideway not far from Glasgow, were taking their lunch on a small hillock looking down on the firth and were watching the water. Suddenly one of them who had been in the Air Force during the war, drew the attention of the others to what they all thought was a jet flying upstream. A moment afterward its terrific speed had brought it abreast of their position. The inlet is a couple of miles broad at this point. As they watched, astonished at its speed and disk shape, their surprise turned to complete amazement. For the craft suddenly dipped down toward the water. A huge splash shot up. The disk rose and then dipping again, once more threw a wave into the air. A second time the disk slanted up, swung easily around and rushed off south over England. This case is unique. We have seen that quite early in 1947 and 1948 there was evidence that a disk might emit a radiation that could disturb a compass needle and cause

movement in treetops (Twin Falls, Idaho and Cascade Mountains, Oregon). Later in this chapter we shall see that Geiger counters — instruments made to register discharges of short wave radiation — have been found to increase their indicative ticking when a disk is over-head. But this case from Annan in Scotland is the only one wherein witnesses have vouched that they saw water violently thrown up by a disk's close approach. One cannot think that any object going more than 1,000 miles per hour — probably a great deal more — could have directly struck the water. Such an impact must shatter any structure. It is safer to assume that the same strange field of force that protects the hull of such craft from burning like a meteor because of friction with the air, also protected this disk as it dipped, perhaps to inspect the (to it) strange element water, perhaps to collect some of this (to these visitors) precious liquid.

Scotland at this time gave us another peculiar and well authenticated sighting that added to our knowledge, and which was confirmed by subsequent sightings over the United States. This fourth example was also near the sea and like the other two was over an estuary. Near Edinburgh the Firth of Forth flows out to the North Sea. It is spanned by a railway line that is carried by the Forth Bridge, famous as the first large cantilever bridge to be built. Road traffic has, however, still to cross the estuary by ferry. An Edinburgh lawyer and his family were seated in their car parked with other automobiles waiting to be shipped across. A train was passing over the bridge. Suddenly all of the onlookers noticed a pair of hollow rings, almost like giant smoke rings, descend from the sky, follow the course of the train and then draw up again and out of sight. The observers were well placed to study this startling phenomenon. They had time to consider what appeared to be a leisurely scrutiny. It is hard not to think that an inspection was being made of the train going over the bridge. It is hard not to ask, who but someone entirely from outside our world (someone who had never before seen one of our locomotives) would use such strange but, perfectly handled binoculars to study with apparent curiosity such a commonplace event?

Britain then has certainly had her share — a full and varied share — of sightings and we must now turn to visitations made in other areas. Two cases from Africa — both from the center of the no longer "dark" continent — are outstanding for a number of reasons. From time to time we have had local newspaper reports of disk sightings up and down the African expanse. For the most part they were no more than random flittings none too well witnessed. Suddenly however a report came to hand that certainly did not lack significance or confirmation. Leopoldville is a small town on the Congo. It used to be unimportant and hard to get to. It is neither now. The jet, of course, has brought it close for it is on one of the big African north-south routes. But Leopoldville has become not merely accessible. It has become one of the important centers on any world map. Why? Because it is the administrative center of the district which at present probably produces more uranium than any other spot on the world's surface. Hence, late one afternoon, as one of the work shifts was changing, there was a peculiar excitement. For hanging over pit 4 (the most productive of all the mines), the crowds of workers saw two disks. A call was put through immediately to Leopoldville. A Spitfire went up. As it approached the disks moved off, keeping a safe distance between themselves and their chaser. They did, however, let him come close enough to enable him to report that just before they accelerated and streaked from sight, he saw their whirling rims. They were apparently of the same model as that which Dr. Craig Hunter viewed in Pennsylvania.

The other African sighting is even more remarkable. Central Africa has at its heart the Mitumba Mountain Range on one side of which lies the Congo basin and on the other the Eastern highlands that finally slope to the coast where stands the port of Mombasa. From this great water shed rises Africa's highest mountain, Kilimanjaro, 19,570 feet. One morning Captain Bicknell was flying the mail plane, the Lone Star, with nine passengers and a radio operator, northwest from Mombasa to Nairobi. It was 7 a.m., the sun, of course was behind him. The plane was above the slight ground mist. Ahead stood the white mass of the mountain. Across its southern spurs lay the air route to the upland city. Suddenly the radio operator and the captain noticed an object which must have been vast, riding as though at anchor high above the great peak's summit. Clearly some huge tubular vessel was standing stock still in the air well above 30,000 feet altitude. Captain Bicknell asked his radio officer to alert the nine passengers. They all viewed the monster craft as their plane flew toward the mountain above which it stood. There were

powerful binoculars aboard the Lone Star. Everyone viewed the object through them. A motion picture camera was brought to bear on it. For seventeen minutes (one of the longest sightings on record) these eleven observers under almost ideal conditions viewed and compared impressions of this strange, inexplicable craft. They all judged it to be a couple of hundred feet in length. In shape it was a thick, blunt-ended tube. Its only features — for neither gondolars, ports, nor masts of any sort broke its smooth surface — were five belts, or bands that gave darker stripes to its otherwise blank, shining skin. And a large fin, like a fish's tail, stood out rigidly at one end. After seventeen minutes had brought the Lone Star and its passengers apparently close enough for the tube to have satisfied its curiosity about them, it rose sharply, leaping upward like a huge arrow shot from a titanic bow at the sky's apex, and in a moment it was gone — the usual strange sky-exit which nearly all of these visitors seem to employ. As soon as the Lone Star landed at Nairobi, Captain Bicknell made a full statement and prepared a drawing. The ten co-witnesses all vouched both for the incident and for the accuracy of the drawing.

The film was taken by one of the passengers, a Mr. Ray Overstreet, radio operator of the U.S.S. Robin Mowbray. The *Natal Mercury*, the main paper of Natal, published in the state capital of Durban, vouches that this film was shown in Durban. The account was written by the paper's shipping reporter who had viewed the film in the presence of the two harbor pilots (Richard Morton and Albert Davis). Captain Morton owned that after seeing the film, though they all had been skeptical before, they were now convinced that there were such things in the air which differed from every known form of aircraft. They agreed that the object showed up quite clearly on the screen appearing more than an inch long, as it cruised far above Kilimanjaro.

These examples are, of course, only specimens chosen because they show two things: (i) careful observations have been made of these mysterious craft outside of America and (ii) such observations have enlarged our knowledge of their varieties.

Since these African sightings the writer has received, among many other cases, an account from Eastbourne on the south coast of Britain. It was a description by the viewers themselves of a lean, tube-like craft that repeatedly maneuvered at great speed, high in the clear sky over the Sussex downs, turning and twisting like a fish in a stream.

This then may be the place to give at least a preliminary listing of the variety of "un-identified" craft that up to date have come down to us from some unknown source, port or station. The first type recorded in the sightings since 1947 (but not, as we shall see, during the still earlier sporadic operations) was the disk. This is a lens-shaped object with considerable variety of detail. Some seem featurelessly plain; some are bossed like a shield with the boss in the center; some (see the Paul Trent observations) have a small mast; others a ring of single ports around the rim; still others, a rim of revolving slats or vanes. Then there are the tubes seen over Africa and England and by Captain Chiles and his co-pilot Whitted (see Chapter Two) and by Captain W. Sperry over Virginia (see Chapter Ten). Thirdly, we have the monster ship, perhaps the mother ship, seen close up by Captain Mantell in the air, and by hundreds of people from the ground (see Chapter Three), and probably viewed also on March 22, 1950 at Idyllwild, California (see Chapter Ten). Finally, there are the rings which behave like large coordinated smoke rings and which well may be scanning devices.

CHAPTER SEVEN

To 1953

HAVING disposed of the objection that they never appear outside the U.S.A. — that they are our own national invention or our own idea of fun — we can continue fisting and trying to order and understand the continued sightings. During 1951 the explainers-away seemed for the moment to have won the ear of the American public. Most of us were persuaded not only to close our minds but to shut our eyes as well. (We shall return to this interesting by-play between informers and informed in the next chapter.) What we have first to point here is that another change in general opinion about the reality of these enigmatic sky engines took place early in 1952.

The area of the critical, new sightings was in Korea and it was the United States Air Force itself that re-introduced the whole subject to respectability (and to the attention of a public a little afraid to notice anything without official leave). It reported that two air squadrons cruising over the front a considerable distance apart had reported "unidentified aircraft" flying in their vicinity. From that time on until the end of the year, sightings poured in. Were there really more visitations or had we only gotten over our fear of stating what we had seen? Certainly the Air Force now decided to give us competent assistance in helping us to decide whether we had really seen an actual unknown sky object. Certainly civilian observation took on a new standard of objectivity and accuracy. The Air Force prepared forms which were sent to everyone who reported a sighting. This thorough questionnaire showed, if there was no other evidence, that the Air Force was serious about this matter. At the same time a civilian investigation committee was set up and prepared a file. Those who wished to send in sightings or obtain information could now write to a certified center. Today, anybody who wishes can send the descriptions which they may have on hand to Post Box 1971, Main Post Office, Los Angeles.

These points however will be considered further in the next chapter. In this chapter we will attempt to order these latest sightings. They certainly set a new high not only in their numbers and their accuracy, but also in the way that they have focused on the very center of our national life. So many of the previous sightings have been in out of the way places — over the deserts and over the sea. But these new sightings which shook skeptical contempt most profoundly — the famous simultaneous records made both by air pilots in flight and by the radar which was directing them — were made in one of the most central spots in the whole world. The place chosen for this manifestation and display of air power was Washington, D.C., directly over the Pentagon and the White House. This area is, of course, not only one of the best known in the world, but also one of the most carefully guarded. Here, is a specific account of the main outlines of that extraordinary visitation.

By the 20th, July had easily outstripped all earlier months in the number of good saucer sightings. At twenty minutes to 1 a.m. the radar operator on duty at the civilian aircraft control center was watching his screen as he directed the commercial planes flying in his district. He saw something on the screen and he stared. For, on this screen along with the small "light-blobs" which he knew were the radar images of the planes he was guiding there were other images. It was obvious that several unknown objects must have managed to swoop in not much more than a dozen miles to the southwest of the capital. Before he could decide what, if anything, could be done, these startling radio profiles flicked out as quickly as they had flicked in. But then they flicked on again and, doubly amazing, this time at the other side of the compass — on the northeast of the city.

The senior controller and all the staff gathered to watch and not in vain. Indeed the real show now began in earnest. For the blips began a fantastic dance. And that dance, everyone recognized was a shadow, a reflection of standard saucer flight. Some hung still in the air. Others oscillated (or circled) very rapidly. Others zig-zaged with those amazing right angle, lightning-flash turns, which we know saucers and nothing else can make. The observation towers at the air fields were now called. Had they seen anything with the naked eye? Yes. And so for the first time we now know that both radar and trained visual observation had recorded the same enigmatic things simultaneously. What was appearing on the radar screen was visible to the human eye. Two trained air field observers at that moment were actually observing in the sky what three radar instruments at three different stations were now also recording. Further, a commercial air pilot who was taking readings from the radar center was instructed by the traffic control to look out for what the radar was showing. And the pilot called back that six strange lights were cruising in the sky. And at immense speed. For few radar screens record fast enough to follow the path of one of these trespassers when it puts on a spurt of speed. No wonder the visitors thought light of any sentries being able to arrest them. The one that the swift radar succeeded in pacing was found to be cruising at more than 7,000 miles per hour. Two more hours passed and then radar equipped air force jets (whose presence had been earnestly requested at once by the radar officials) did thresh in from the coast and told the radar men on the ground that there was now nothing to be seen, To which the radar officials replied ruefully, and perhaps a bit caustically, "And now there isn't anything on our screens either. But

why didn't you come before?" The planes, therefore, as their fuel was giving out went back to their base. Promptly, the blips returned, throwing bright dancing reflections over the radar screens again. And this time, as one of these seemed to be keeping company with the blip shadow; cast by an incoming plane, that plane's pilot, Howard Dermott, was instructed to see if anything was visible to his eyes. Sure enough when he looked in that direction there was an intense white light at the very spot where the radar had told him to look. During most of this night the eerie fleet had waltzed about with the apparent carelessness of midges dancing on a summer's eve. No pattern seemed to be evident in their exuberant flight. But whenever an earthly plane came cruising in, then as roaming guils flock about a fishing skiff approaching harbor, the radar showed that the unknown craft had gathered round, observing the plane. Five days later, just after dark, pilots in their planes were alerted: "blips show that you are now surrounded by unknown air company. Look out." Most replied, "Yes, we are viewing cruising lights where you instructed us to look." By 11:25, jets complied with the request that they inspect what was going on. And the radar officials, who had been impatiently summoning them, maintained that one pilot reported he saw four unknown lights and chased them at his top speed for two minutes. But they withdrew much faster than he could follow. The radar officials also announced that hardly five minutes after this another pilot reported a similar sighting, a similar pursuit, and a similar disappearance.

According to *Life*, which gave a full account of this unprecedented visitation, the Air Force seemed uncertain as to what should be said. On the other hand, Henry J. Taylor, top rank commentator who until then had stoutly held out that the disks were secret U.S.A. weapons, considered the evidence and came to a new conclusion. He showed that he had been right in maintaining that the United States is at work continually improving instruments of defense, but that above and beyond these official secrets there still remained stubbornly aloft and inscrutably aloof, the enigmatic "unidentified aerial objects."

However, some people who till then had told us that radar was our super defense now began to say that it quite often reported solid objects to be present when, as a matter of fact, nothing but disturbed air was causing the image on the screen. These stale theories that all saucer sightings, and so also these at Washington, were only mirages, was once again floated out to comfort those who fear anything that an authority can't explain. It is true that when a hot layer of air gets above a cold layer there is what is called an "inversion." And this does sometimes take place over deserts when at night warm air can rise quickly and cool air floats in underneath. Then a warm upper layer can best reflect lights on the ground. This inversion, however, has to be considerable — at least nine or ten degrees. Donald Keyhoe, in his December, 1952 article in *True Magazine*, gives an account of the inquiry that he made at Washington to determine how much inversion would be needed to make the mirage effect. The Air Force expert he was able to consult said it would need an inversion of temperature of at least nine degrees. The weather bureau chart showed that on the night of the first visit the inversion was only one degree and on the second visit it was hardly two. Keyhoe also asked the Air Force if they had requested Dr. Menzel, chief propagator of the mirage theory, to apply his analysis to the cases that were well and truly reported. He was told that the doctor had been asked to do just that, and he was also informed that the doctor had not attempted to meet this requirement. Until this statement is refuted it is clear how much credence the public can put in the mirage theory. We are bound to ask. is it itself a mirage — or a smoke screen?

But though the air above the Capitol gave the saucer mystery its biggest spring life, the air above the desert was not deserted by these interplanetary investigators. Indeed, the New Mexican desert air gave rise to a new phenomenon — the green cruising fireballs. At the time of their first appearance they were also sighted over western Austria and, as of the date of this writing, they were still being seen in many parts of America. They do not resemble in form or in flight any ordinary meteorite. Emerald green is a very unusual tint for a meteorite. Add to this uncommon complexion an equally uncommon slowness of flight and steadiness of path (in many cases they seemed to be flying on a steady horizontal course rather than sloping toward the earth). So it is hard to think that these are just chunks of sky-rock pitching in overhead from out of space. Two further odd features (one unprecedented and the other completely anomalous) make the meteorite hypothesis impossible to hold: (i) after these green objects have passed overhead, the air is found to have in it distinct traces of copper. A copper meteorite is yet to be found.

The only metallic meteorites are of the well known nickel and iron type, (ii) On more than one occasion over the Southwest, highly trained observers have told the writer that they saw such a globe or disk "change its mind." It seemed set on making an earth landing. But suddenly it reversed its course, shot up again and disappeared in the dark sky above their heads.

In addition to the green fireballs with their strange paths, the desert has had constant disk visitors both by day and by night. And when they come at night they glare, generally with a blue-white light, when in motion. All of this had been fairly well known before last year. The great addition made by 1952 to our disk knowledge is the certified fact that when a disk passed over head, Geiger counters have been found to double their discharge. The disk, as we have seen, is nearly always silent and that probably means that it must be cruising at about 25,000 feet. And yet an object so distant, some four miles high or more, proves to be so intensely radioactive that it acutely disturbs an indicator of short wave radiation. We know of no source of radioactivity as powerful as that. This discovery does a great deal to buttress the suggestion which will be put forward in Chapter Ten that the powering of the craft may be magnetic. Such a powering could explain their unprecedented performance and also would seem to indicate that their passage to us could have been from no other country on earth, but rather through space from some other planet.

Meanwhile every week of 1952 was filled with authenticated finds. The majority confirmed past observations. From New Jersey to Vermont a series of daylight sightings traced a bright disk-like object. One Vermont observer told me that it appeared quite large and looked like a white stalkless mushroom skimming across the sky going north. Many photographs were taken of three disks cruising along the Massachusetts coast. There were the twin rims that in March had swooped down at Greenfield near Boston. They gave out a high pitched note as they moved. Otherwise their inspection was curiously similar to that made of the train that was crossing the Scottish Forth Bridge — the same rapid descent, the same apparent scanning, and the same equally rapid withdrawal up-sky. Another ring inspection on a far vaster scale and over a more spectacular location was witnessed in mid-summer over the Niagara Falls district when hundreds of people both in Canada and in the United States watched giant twin rings scan this extensive area. From Rio de Janeiro's world famous harbor also came reports of a disk that suddenly rushed in from the Atlantic, toward the bay in full sunlight and went out and up again. Four first rate photographs were taken and published in Rio's best known illustrated weekly, *O Cruzeiro*. They stood up to inspection until an expert photographer discovered that the shadow apparently thrown on the disk's flat flange by its central boss would indicate that the sun was at a different elevation than that indicated by the shadows thrown by some bushes that appear at the foot of the picture. This, it was suggested, showed that it was possible two exposures had been made on the same film. Yet the director of the Rio observatory came forward to say that he had been out on the observatory terrace on the day that the photographs were taken and he himself had seen the disk object come in to the bay, fly round and go out to sea again. During July and August a slightly different phenomenon was witnessed repeatedly over the Los Angeles district by numbers of onlookers. A bright light was seen descending from the zenith. After it had come down some distance it seemed to hover. Then suddenly four small satellite objects (sometimes brighter than the parent body) appeared to be ejected, and the parent body either disappeared or turned off its light. In one case at least the four smaller objects appeared to come together again. A single body was formed and the whole object shot out of sight.

So the record continues: a steadily mounting number of good observations by witnesses not only competent but impeccable and made under excellent conditions. The craft would seem to remain in the four main categories: the disk, the tube, the huge object — possibly the mother ship, and, finally, the rings or scanners. We may add that the hanging lights which seem to play at making themselves into temporary chandeliers could possibly be some further and newer variety of detection, devised to permit an even closer study of the earth. For we cannot help assuming (as we shall continue to discuss in the chapter "Whence Again") that if these visitors seem interested in studying us they also seem anxious to avoid becoming involved. We have to realize (and this book will stress this matter) that we could be triply dangerous to them, (i) The pull of our gravitation could easily hold them motionless — as an iron filing is

held by a magnet — if they came from a lighter planet, (ii) Even if they emerged in some kind of protective covering (and so screened themselves from the danger of being asphyxiated by the air we breath — which to them might be poisonous gas), our germs and viruses clinging to their suits and so brought into their ships could start an epidemic and kill them all. (iii) Our very uncertain tempers and our capacity for panic might lead us to massacre them. They, therefore, would strive to observe us as we in a submarine attempt to observe and record the alien conditions and creatures in which underwater craft are submerged. And, similarly, they must remain in their craft, or perhaps perish. Reason would suggest that the vast differences between our native conditions and theirs had required that they keep their distance and also that they devise instrumental means for studying us. Those of us old enough to remember the contempt with which able men in their prime in 1900 regarded the prophecies of television, should not find it too hard to credit minds, so far ahead of ours in propulsion and vehicle design as are these visitors, with equal advancement in detection devices.

To the best of our knowledge the craft have not landed — unless we credit the strange and singular report of the East German refugee and his young daughter who, after escaping from the Russian zone, declared that for a moment and in the dusk, they had seen a saucer on the ground, its two occupants outside their vehicle. There is also the anomalous case of the scoutmaster in Florida who vouched that he approached an object that was on or very near the ground. He, however, avers that a sudden discharge from the object felled him so that he was naturally unable to make any inspection of the vehicle if such it was.

Now that we have very briefly given the principal sightings to date — the cases that illustrate the type of craft with which we have to deal and the powers, intentions and limitations of the possible visitors — we must go on to consider what we should do and what so far has been done. We must turn to the other party in the matter, the involuntary host, ourselves, and our reaction to this visit.

CHAPTER EIGHT

"Project Saucer" and Public Opinion

THIS chapter must ask: while all this was going on, what was authoritative opinion doing about it? We saw at the very beginning of the story that three factors wound together made the fibers of this strange tale.

The first were the actual experiences of a number of trained men, trained in accurate observation of aerial craft and sky phenomena. This sum of most valuable findings and opinion has grown. You can rub off and brush away the reports of goodhearted and honest lookers-on, who may mistake a meteor or a meteorological balloon for an unknown, original aircraft. But you can't get rid of the evidence of men who are trained to observe and who in observing are on their own ground. These men do not want publicity — quite the reverse. They don't want to see tilings that are odd. They are neither credulous nor fanciful. As that most capable of critics and skeptics, the great logician John Stuart Mill, laid down as a basic law of evidence and of the attempts to rebut it, "We must remember that men are more liable to be right in what they affirm than in what they deny." For the principle is based on the fact, which anyone can prove for himself, that hallucination, however common it may be, is less common, far less common, than ignorance. There are in the Universe, any sensible man knows, far more things that I have never seen than things which I have imagined were there and weren't there.

But beside the first-rate reporters, the first-class observers, there were others. Not only were there those people who never seem to observe accurately and always embroider what, in W. S. Gilbert's immortal phrase, is called the "bald and unconvincing narrative." There is the utter "hoaxer" — that exasperating person who gets his sense of superiority from taking people in, the man who wants to be talked about even though he is ruining the sense of reliability among average people who tell the truth. Such people are the spiritual descendants of the man who burnt down that wonder of the ancient world, the Temple of Artemis at Ephesus, and gave as his reason that now he would be talked about. Naturally the disks have seemed an opportunity to such people. Their reports have been dug into, and most of them

have crumbled up. But the hazard of such creatures is that they make the work of finding out what actually happens doubly difficult. And it does go some considerable way toward explaining why responsible persons (and especially those who have to carry the most responsibility, the officials of the Defense Forces and of the Government) have "leant over backward" to keep the story from getting premature approval, and have exposed the evidence, again and again, to examination, in the natural hope that it might in the end all be fitted into known or likely types of experience.

For that is the third thread in our story — the official story, what the authorities said about the saucers. And this story by itself is one as complex as any psychological novel ever written by the most intricate of authors. Yet we shouldn't be surprised at that. As was said at the start, this isn't an easy subject. And as we all know to our cost in daily anxiety, this is not the time when you can say all you have on your mind. It is not a time when mankind is conducting itself with such world-wide rational behavior that we can give all our attention to things that may be coming from outside our world or from sources that are not official.

America is the freest country in the world. Except during a war you may ask about anything and expect an answer. That's because the Press is so powerful. And the Press has power to push its probes so prodggly because the American public wants, almost as much as it wants fresh food, fresh news. Where else in the world is a President so regularly quizzed, his aides cross-questioned, even on their private affairs? Even Mrs. Mary Baker Eddy, whom many regarded as almost superhuman, had to give an interview, and a long and intimate one, to the Press. The American public therefore expects its officials to tell it, in reason, what they are doing and what is happening in their respective fields.

We have seen the initial reaction of the Armed Forces authorities in the Northwest corner of the States, where the disk problem first became of nation-wide concern. The official line was to say the evidence was far too poor to permit anything but the conclusion that these stories were inconclusive. And that was fair enough. You need a lot of evidence to lift stories out of the rut of ordinary explanations into a class by themselves — "inexplicable." Besides, look at the map.

The Northwest of America is now a frontier as tight and nervous as those old festering frontiers which in Europe, with only a few miles separating camps of counterarmed men, made frontier incidents a continual sleep-spoiler for weary diplomatists and jumpy foreign offices. The plane has made frontiers both ridiculous and doubly dangerous. So that display out at sea which the Portland, Oregon, people and the Seattle citizens looked up at on that Fourth of July fiesta day in 1947 must have seemed to Defense Force men anything but delightful. Could it be a big and somber neighbor looking over the coast, looking down at the great open areas of the big Northwest?

But as the reports grew, two things did grow clearer, if not more comprehensible. First, they couldn't be dismissed; they must be quizzed and sifted and criticized. The second also called for a little more openness. If they would stand up to examination at all, then they would perhaps prove themselves not to be the most pressing of perils. Perhaps, if the proofs held up, they would carry the whole question — odd as that might seem — right outside present political controversies and international tensions? Whatever the reason, the fact is clear. On the last day but one of the Year One of the Disks, December 30, 1947, the decision was ready to be launched. Project Saucer was to be set up.

There was to be a central authority, equipped with experts — astrophysicists, electronic experts, meteorologists. Radar, as well as the telescope, was to be at the service of these judges and searchers. Even that wonderfully efficient instrument for discovery, the Federal Bureau of Investigation, an invaluable service for disclosing hoaxers, was asked to aid the Project.

The first summaries that were issued were clear and hopeful. The greater part of the reports had been satisfactorily disposed of. But it was owned that a residuum, a core of hard fact, seemed left. So the moral, as the issue of these findings gave it, was definite and lucid. There seemed to be no rift between the public and its representatives. There was a free exchange of news. The public brought in its "viewings." The Project questioned, enquired, weighed and gave the finder and the rest of the public its evaluation of the raw material. And it was allowed (a conclusion with which every sensible private person must agree) that as there were unidentified air objects wandering about which could be at present

attributed to no known source, why, then "constant vigilance" was needed not only by those on the Project but by the public. Please report anything you see, as soon as you do, to the authorities.

Certain helpful information was also released, telling the public: (i) what they might mistake for "unidentified air objects," and (ii) what the unidentified objects had been said to look like — the four types we now know: the disks; the long, black wingless tube; giant "balloons"; and balls of light. The report ended with a friendly note: "The saucers are not a joke. Neither are they cause for alarm on the part of the population."

Here is a frank facing up to an exciting mystery. There is no ground for misgiving. There is evidence of a mystery. There is the chance of making some very interesting finds. That is the kind of attitude one expects from the Government of a free country toward its free constituents. Life is an adventure and has risks, but if people are left free and given carefully tested information as it comes to hand, they can face surprises and make constructive responses.

At this point the Project itself became a mystery. Throughout, the Air Force had said that to the best of its knowledge there were no such things as disks, and it gave in March, 1950, a definite denial that the Air Force itself was engaged on any work that could be taken for the kind of thing that appeared in the newspaper descriptions. Nothing was being made for secret missiles or space-ships that could at all resemble disks. And yet the reports went on.

As yet no one had summarized the story as a whole. In May, 1949, the big-circulation, illustrated magazine, *The Saturday Evening Post*, did issue a two-part article that ran in successive issues. The survey of the evidence was written by a very competent reporter who had gone round and collected not only stories but the opinions of various Air Force Commands and "Intelligence Officers." The conclusion was that the public might rest assured that there was very little in the whole thing, and pretty certainly nothing. But while this clear statement was being read with some assurance by hundreds of thousands of readers, the Air Force issued a statement on its own, containing the remark that there were cases of unidentified craft having been sighted aloft and that these cases indicated that vigilance was the proper attitude not only for official lookout men but for the public as well.

So once more the issue seemed in suspense, literally hanging in the air. And, if human evidence could be trusted at all, the phenomena were finding more and more occasions to hang out over the heads of surprised persons.

What, however, was now becoming clear was that the public mind and the professional mind were tending to change places. At the start of Project Saucer at the very end of 1947 the experts had been a bit ahead of public opinion. The experts had declared that something might be there. On the whole, after the first burst of excitement, and a lag in fresh stories, the public — as is generally the case — began to think less well of the somewhat stale sensation. The big magazines that people look to, to summarize, order and give judgment on a series of scattered items — whether of pure research or what we used to call Natural History observations — all of these organs of considered judgment kept quiet. While we have seen what a wide-ranging magazine such as *The Saturday Evening Post* had to say, the refusal of the big magazines and the powerful, acute dailies to touch the story with any seriousness, undoubtedly influenced the educated.³

There was no doubt here a pretty play between the two horns of that great bull, Democracy: the horn of the public, the source of all authority, and the horn of the politician, the expression of all authority. A free citizen in a free Democracy may rightly be as afraid of embarrassing his free Government as the unfree subject of an unfree state may naturally fear offending the Government that controls him by force. As long as the disks could be earthly — and unearthly notions are really not at all native to the American mind — then, alas, who in the world could produce them if not America? Only one person, only one Number One.

3. The present writer knows from personal enquiry that a representative of one of the leading news weeklies did report that he had seen a disk while in Mexico, and this paper, which had declined heretofore to give the subject any serious attention, refused likewise to print this, its own representative's finding.

So here again was a dilemma: (i) These disks may be ours — and that of course, while reassuring, is one of those reassurances about which we naturally want to say as little as possible. Or (ii) — and this is the other horn of the dilemma pressing us to silence — they come from the only other possible source. And if that is so, what can be done but to keep quiet and wait and hope that an answer is known to someone, an answer so complete that it would be madness to ask for it before it speaks decisively for itself and on our behalf?

So much for the public and their wish to be silent — if the disks are earth-born. The other horn of the Democratic bull has equal reason for wanting to pull itself in and keep its own counsel. The Government of a fully democratic state must live in a kind of humorous fear (or perhaps, in humility, it would call the feeling by the old-fashioned but stately name, "godly fear") of its queer master, the public. An oligarchy can thumb its nose at the people — "Everything for the people: nothing by the people," is its motto, and it tells them flatly that they can govern through the naturally born governors but never on their own. But a true Democracy can't. The President of the United States is in one way the most powerful man in the world but only if he knows he isn't — that's to say, only if he knows that he must daily accept, silently and cheerfully, jibes and attacks from which the least powerful citizen in the whole country could and would take refuge in the law to protect and vindicate him.

So, with disks aloft, it is natural for each horn to say to the other, "Gentlemen, you go first. You probe. There is no one to stop you." But then is the Government fibbing quite heavily when it says that it, itself, knows nothing of earth-launched saucers in the sky? The quizzing has gone on now right up to the Presidential entourage and the President's aides have said frankly they know nothing and that, on their word, they don't believe the President does either.

That brings us to a further development of Governmental responsibility in a Democracy. No man can be a politician unless he knows by a kind of intuition what people will stand and stand for. In the old safe world in which the American Founding Fathers built their noble Palace of the People, the foundations were clear and firm. You knew the kind of weather that the good sense of the electorate would have to endure". But since then moral earthquakes have shaken the assurance of free mankind. From Physics' saying that anything may happen and, maybe, Causality itself isn't true (and so what you do today may not rule what will happen tomorrow) — through Biology beginning to mutter, "But of course, you know, we've proved men are not equal and quite a lot are too stupid even to be taught" — onto the wastes of Psychology, where human character seems to dissolve in a web of vague emotions and will is merely a figment — why, Science today, which was once the freeman's friend and almost his patient beast of burden, now looks more like a phantom dog that the man took for a walk and, while in the wood, grew into a tiger — and its poor little master came back home "inside."

That then is the chief problem of the Peoples' Rulers today. Can men stand the truth, now that the truth gets odder and odder? For instance, just as an example, if you or I were President of the U.S.A. and we happened to think — though without absolute certainty — that what was up in the air, as well as being partly men's mistaken opinions of natural things, might have, here and there, mixed in it, off and on, something even more unsettling than a messenger from "Mr. Number One of the Other Ideology" — what would we do about it? Why, in the name of common sense and sanity, we would wait; the sovereign recipe of every wise ruler.

There is in time of peace no censorship in the United States nor any sign that it would ever be possible. To the old adage, "Who guards the guardian," free people add the rider, "Who censors the censor?" What then would a wise ruler do who felt uncertain in his own mind of two vital and, when combined, very awkward facts: (i) that there might be a piece of news that would be beyond anything that men have ever had to stand as yet, hanging over their heads; (ii) that the people are already as nervy — in these wars-of-nerves — as they have any right to be asked to be — and a bit more so? There are two ways of keeping news back till you are quite sure of it, can define it, can say what it will do and what it can't do. The first is of course censorship and is, we see, out of the question in peacetime. The second is the nonviolent way and, like most nonviolence, it is better than the "clamp-down" and the "gag" — if you have time to let it work.

That second way, too, is one the United States takes to naturally. It is the debunking joke. It has been used with great success on that other shocking subject for fifty years and more — the subject of *Psychical Research* and the discovery of *Extra-sensory Perception*. You say to the person who begins to show an interest, which you feel he may not have the balance to handle, "What, you taking an interest in that sort of thing! Of course it intrigues shallow minds, emotional, uneducated persons. But you with a college degree — of course you don't take those silly collections of stories, those feeble little columns of figures, against the vast sane scientific opinion of the experts!" A brilliant controversialist opened one of his most telling counterattacks with the wise and strategic words, "It is hard to answer a sneer." To which wisdom we may add the anthropological observation, that it is even harder to resist the offer made by a cultured friend to get one back into the good graces of the educated — good graces which one's rash and untutored interest in evidence they do not approve has brought one close to forfeiting for good. Excommunication is the most powerful engine man has ever had in his hand. The Greeks, clever as any, would, however, rather die than be sent into exile. Adam Smith, Father of Economics, says that what drives men to suicide is not loss of goods, or even of health, but loss of their fellows' approval.

Enough has been said to indicate at least a reason why the Government in America may be acting as it is and why the public has done much the same — both have waited, and, like the tar baby, for quite a long time have "gone on saying nuffing." Indeed the Government, as expressed through the expert and official Air Force, has said the subject is closed. Project Saucer probably closed in September, 1949. Certainly by the twenty-seventh of December of that year the Air Force declared that all the cases that had been submitted had been disposed of, shown to have natural causes. But the silence of the Press, the well-informed Press, as the silence of the Government deepened into totality, began to have whispers in it. Local papers and small magazines had carried on a gallant attempt to win general attention. It was like blowing a whistle in a totally soundproof chamber — your cheeks swell, your ear remains unaware.

Then a New York magazine of quite big standing dared to stand out. *True* is a fine monthly which issues articles on true topics, of adventure, discovery, crime detection, all well documented and very well told. *True* decided to take the plunge. It took the greatest care. Were there secrets which ought patriotically not even to be asked about? *True* was certain it was not going to foul any of these defense lines. Then why the silence? For, as to the facts, the data, *True* knew (as must every other patient collector unheld by prejudice) that they were true. There could only be one explanation: The Government and the subject authorities were waiting, waiting until "may" became "must." And they were waiting because they did honestly doubt how much the public could stand, if the uttermost explanation of the data proved to be true.

After all, twelve years ago two famous men of similar name — Orson Welles, the actor, and H. G. Wells, the author — were jointly and innocently responsible for a very queer little anthropological reaction. Wells the elder's story *The War of the Worlds* (in which Martians come to earth) was radio-dramatized by Welles the junior. The story is good, if dated. The "putting on" was charmingly competent. The present writer heard it without warning. But the result was odd. Some people scattered about the country actually thought it was true and began to make plans to leave town! And when this little success was repeated in South America, the acknowledgment of its skill was even more spontaneous, even to the point of acute embarrassment — for there some of the public attacked the studio for giving them so convincing a performance.

It has often been suggested that the whole of the United States trembles on the edge of such panic. The answer to that is that when the Atom Bomb came, and not more than four years after there stomped in on the heels of the first fury the Hydrogen — or Hell — Bomb, the people of the United States did what? They continued their lawful occasions and occupations; they sighed quite a lot; they thought it was a pity and a shame; they went on feeding Europe, believing, certainly kindly and probably wisely, that fed men are less likely to be mad and murderous than unfed. But are these the acts of men on the edge of madness? Madness and panic should be made of hotter and wilder notions.

So *True* got a first-rate reporter — Major Donald Keyhoe (retired), long versed in air research. They sent off to the world in consequence as a New Year's message — it came out, as it happened, just

after Christmas, 1949 — their and his considered summary and judgment. There was no ground for alarm, but much for keen interest. No power on earth could have made these things. The United States was safe in its air supremacy. They were no more and no less than some kind of outer-space phenomena.

That did, however, upset quite a number of officials who felt it was going far too far, if not evidentially, then as a matter of discretion. The much-tried public was bound to be upset. And as, when people are upset by anything from an earthquake to a twinge of conscience, they blame the Government, why, of course it would be bad for politics, bad for business — for the stock exchange is notoriously easy to discourage — and bad for peace, progress and prestige. But the sovereign people was not upset — on the contrary it appeared to be interested, entertained, even to a certain extent amused.

As said above, the Air Force denied that it had any hand in such contraptions — if they existed. And, to help that strong doubt to hatch into a conviction in the minds of the public, the Air Force released the files they had collected of cases reported. They maintained that these reports and their rebuttals of them showed that there was nothing to go on enquiring about. Others who viewed the lists of cases felt that some of the answers, though they might satisfy an air official, left the unofficial mind still open, still questioning.

Among these students of the new "released" material was Major Donald Keyhoe and he was certain the case was anything but closed. To support his belief there came to hand, through his efforts, the complete statement and comments of Commander McLaughlin on what had been seen in April, May and June at White Sands, New Mexico. This published in the March issue of *True*, was the second great contribution made by this candidly courageous magazine toward letting the public know.

And the disks did their bit too. For that breezy month of March — which is, by the way, the month of Mars, who in his early history was not a god of war but of the first springing month of the year — March, 1950, marked an outburst of sightings. They had been sighted fairly frequently through the first two months from Pennsylvania to Texas. And out at sea a plane over the Pacific reported that for five minutes it had as a companion a saucer which had tired of their ambling gait and taken off at a speed which was utterly beyond anything they could command.

And February 1 had a wonderful show — the biggest so far — for the people of Tucson, Arizona. Waiting till dusk, but then making the run with fire streaming from it, at what was judged 30,000 feet, the object swooped right over the city. But reaching that station it paused. The trail of smoke that came from it cleared. Then for a moment there came a burst of black smoke; then the smoke was a light stream again, as off it went at its super-dashing speed. A B-29 was just leaving the ground. The radio operator of the Air Force Base control tower asked him to pursue. In vain. All he could say was that the thing was making for California, would be there soon — and then? Then no doubt it would take, as they all seem to take, to the sea. Hundreds saw the thing. One citizen said it swayed about so he thought it was a large plane on fire. But no planes were missing. The *Tucson Daily Citizen* carefully collected the reports and next day asked why the following afternoon detachments of the Air Force spent hours etching vapor trails over the city. The paper remarked their efforts weren't the least like the trail left by the Thing. But the Associated Press carried no report of this and newscasters didn't get it.

Three weeks later, right down at Key West at the tip of Florida, high up (some thought it must have been at heights only a rocket plane could fly) again there was a sudden appearance, a pause or a hover, and then a dash away that made any idea of pursuit hopeless.

But the most remarkable and perhaps the most significant came on February 23 from the base which Chile keeps right down on the Continent of Antarctica to claim her right to that desolate hub of polar land. Commander Augusto Orrego reported that the disks had been wheeling above his most desolate station. It was, he said, during the bright Antarctic night. "They were one above the other, turning at tremendous speeds." (There may be something very important in that particular observation. Why, will be suggested in Chapter Ten, "The Craft and Their Power.") Commander Orrego added, "We have photographs to prove what we saw," and then further added the sad subtraction, "But they are the property of the Chilean Navy and not at present for publication."

On the day of the Equinox, to mark the beginning of the summer side of things, an air liner crew

near Stuttgart, Arkansas, saw a disk remarkable for the fact that as it pulled round in a grand curve — which would have blacked-out any human inside it — it blinked a blue-white light. Was it signaling? It had ports on its lower side and they had that odd, canny glow-glare that we have met before in the Chiles case, when the great black tube rushed past him and his colleague as they piloted their passenger plane. On this latter case, described above, United Press made a definite report-story. The two observers, Captain Adams and First Officer Anderson, both made statements. They both added to their report their opinion, given as a conviction: "Firmly believe the flying saucer we saw was secret experimental type aircraft — not a visitor from outer space." Well, report is one thing and belief arising from an external inspection is another. The two men added, "We know that the Air Force has denied that there is anything in this flying saucer business! But we are both experienced pilots and we're not easily fooled." Certainly, not by the fact that something was there. But did it show its "port clearance papers," did it tell them it was made-on-earth or where on earth it was made? Of course it didn't.

And so the stories grew, increasing in numbers as the days increased in length and the chances of upper-air observation improved. The Californian coast had a fine crop. At Laguna Beach, a well-known seaside resort, a covey was seen go over and as usual turn out to sea and there go from, sight.

By May it was time for one of the "Polls of Public Opinion" to report on the condition of American conviction on this point. On the twentieth George Gallup, Director of the American Institute of Public Opinion, issued his findings. They showed one thing — that the public was neither frightened nor skeptical. In 1947 most people when questioned said, "Fake and fraud," "Hoax and nonsense." Now to the question, "What do you think they are?" 23 per cent said, "They are secret weapons in trial stage or pretty nearly ready"; 6 per cent said, "New kind of plane"; 3 per cent, "From Russia"; 5 per cent, "From another planet or star"; 94 per cent had "heard about them." Only 22 per cent thought they were hoax or illusion.

And all through 1951 the attitude of the Government, the Press and the Public remained what we have just seen it grew to be in 1950. Then, as we saw in the last chapter, saucer sightings again became mentionable. The Air Force led the way with the Korean sightings and since then our knowledge has been growing steadily. Here, briefly, is the story of the corresponding growth of public opinion and official utterance.

As we have seen the Air Force once again officially opened the investigation (there is reason to suppose it had never wholly disregarded the anomaly) and let the public know that it had. The Civilian Saucer Investigation Committee mentioned earlier was now able to establish the most friendly relationships with the Air Force which wished to receive such data as the Committee might collect. Captain Ruppelt, head of the reconstructed Project Saucer twice visited the Committee and talked over the problems of investigation, e.g.: the cameras with which it hoped to get not merely photographs of what the "saucers" look like, but also some insight into what metal or other material they are made of; and the question of the quality of evidence (what, for instance to do with the person who has made a fine sighting but does not wish to be questioned for fear "his name should get into the papers"). The Wright Patterson Field once more was the center from which this investigation was to be pursued. Life not only gave the Civilian Investigation Committee publicity but put one of its best reporters on the story. His published account was so factual and cogent that no open mind could resist the conclusion: the public must be prepared for the fascinating possibility that space visitors could be hanging over our heads.

This article resulted in a larger mail from interested enquirers than any other article this immensely popular magazine has published. *Look* and *See* also printed well documented articles. *Time Magazine* still resisted. Perhaps its sense of perspective compelled it to believe that an affirmative conviction was premature. Dr. Menzel of Harvard (see Chapter Seven) came to *Time's* support, maintaining that he could and must kill this Santa Claus. Saucers, according to him, were real in the same way that mirages are real. All sightings were to be accounted for by ground lights — automobile head-lights, etc. — which were reflected back from the night sky by hot layers of air. This however would not explain the day sightings, and even less the cases given in this book where pilots witnessed disks and tubes flying round their own ships. Mirages don't circle round you and blink lights at you. There are also the reports of pilots

who flew over saucers.⁴ And these sightings were not over deserts where hot, mirage-making air-layers could be formed.

Another theory that *Time* entertained was that eddies of air could rise and, owing to anomalous conditions, could contain glowing globes of radiance. The experiment was successfully performed in a laboratory. No one is certain however that this phenomena ever does take place under natural conditions. The members of the Civilian Investigation Committee were able, through the courtesy of the Air Force, to explode another popular debunking theory — one which was greatly played up two years ago. They were invited to witness the launching and follow the flight of the upper air meteorological "sounding balloons" that had been said to be the real and only explanation of saucers. From the moment the balloon was released, till it exploded at a great height they watched this object's flight, keeping it under constant observation with binoculars. They all agreed, and their Air Force hosts agreed, that no competent observer could ever have mistaken this simple and obvious object for a saucer in flight, and of course even less for one of the great tubes. We have seen also that the Air Force permitted Captain Ruppelt, head of its new investigation, to be interviewed by the Press and to hold conferences with the Civilian Investigation Committee. So thorough was the Air Force questionnaire, and so cordial the encouragement given to sighters to state what they had seen that no one could doubt the concern of the authorities. They were as eager as any "field investigator" to obtain information and order their findings so that an enlightened opinion could be formed of what we are up against. And certainly not the least significant symptom of the changing climate of public opinion and reversal of conviction is commentator Henry J. Taylor's statement, also referred to earlier, that though the United States is making great progress in secret aerial defenses, there nevertheless remains a mystery above and beyond our highest aerial achievement.

Who can then say that the Air Force isn't interested and dismisses the whole thing as hoax or hallucination: or that no sensible and informed man gives the matter any credence because no cases can stand up to examination without being refuted as meteorites, missightings or miasmas. It is clear that after an eclipse of interest and confusion of views, American open-minded and informed opinion and American expert air authorities are at one and agreed — saucers are a mystery, but they do exist. There are unidentified aerial objects cruising over-head — not mirages or giant "will-o-the-wisps," not human to the best of our knowledge, but directed by some intelligence that is certainly above our heads in both senses of the word — above us in air altitude and in air mystery.

CHAPTER NINE

The Whences?

IF then we are to render the authorities the help they request of us, we should restudy the instructions which, at the start, Project Saucer issued for our guidance. For, until science can order all our findings and so make safe generalizations about these craft — why, when and how they appear — any of us lay-folk may chance to be as useful in lighting on a super-clue as the air-experts. That is the state of affairs that always has to exist at the beginning of a new science. Field observation by amateurs plays a very important preliminary part before laboratory (or observatory) study by experts can be undertaken. This was certainly so with the study of meteorites which, as we have mentioned, were once as unpopular anomalies with professional scientists as saucers are still today.

Here then are the basic instructions that Project Saucer laid down to guide any investigator. You may be the kicky person to get so good a sighting that it may be decisive in helping the authorities to know whereafter they should look if they are to learn whence these strange things are coming, what may be their base, what their present station or stations, and so what might be their powers and intentions. Note then these words from an early "Saucer" publication: "There is nothing to guide human judgment but probabilities. No one can say absolutely that something didn't happen. When then can you be sure it

4. The accounts by Flying Officers W. B. Nash and W. H. Fortenberry who, flying a D.C. 4 near Norfolk, Virginia on July 15, 1952 found eight disks glowing red, zig-zagging under their plane.

has?" And that — as the paper went on to show (and it is the opinion of every accurate thinker) — that degree when probability becomes certainty is — for you — ruled by you.

There are certainly three degrees of probability for all of us. The first is moderate and may be called Probability of Argument. You can't be at all sure but you believe, from what you know, a case could be made — till your opponent can upset it with further evidence now unknown to you.

The second may be called Probability of Action — you have reached the point where you are willing not merely to argue but to act on what you know; you are ready to assume that what you have found is sufficiently proved and points sufficiently to a certain conclusion: and from that conclusion you go on to collect more evidence.

The third is a still further degree of assurance — and we must own it is rarely arrived at in anything but such pure sciences as Physics and Astronomy — sciences which deal with what we used to call dead matter and now prefer to name the inorganic, those forms and objects that seem to be quite lifeless, quite unconscious. This, the third and highest probability — which most people, somewhat unwisely, call practical certainty — is Probability of Demonstration. You can account by your explanation for all the evidence that has come to light and been brought to hand. But of course you can never be sure that there is not another explanation that might cover the facts just as well. Then what do you do, what has the scientist nearly always done? He has used something which he calls, rather ambitiously, the Law of Parsimony. That, in ordinary English, simply means that the simplest explanation is always to be trusted. But that of course assumes that Nature is at base quite simple.

Now that may be so, but how do we know? Has any one proved it? No. Does the present evidence from Physics, the basic science, show that the Universe is really quite simple at base? True enough, we thought so once. But that was when we were hoping that in the end we would find, as the early Greek scientists had believed, that all the Universe was made up of irreducible "atoms" — which simply means ultimate objects, all simple, all quite like each other and all incapable of being reduced, broken down into anything else. We all of us know that that view has been disproved. The demonstration that drove the matter home for all of us was the Atom Bomb. With that explosion the theory that matter is really not matter but a terrible form of locked-up energy was turned into terrible fact.⁵

So absolute certainty is no longer possible on these difficult questions as to what can happen and what has happened and what may happen. We can only take the evidence and see how far it pushes us in our honest attempt to account for it all — if it is good — and not reject or suppress any of it simply because it seems to us unlikely. As a line scientist, a physicist, said the other day, the word "incredible" went out of accurate use with Einstein — the Einsteinian Universe is quite incredible to old Common Sense.

So let us begin at where we actually are, where we find ourselves: Granted that we cannot resist the evidence that very strange craft do ride the skies and have been seen maneuver by thousands of perfectly sane, informed and critically minded witnesses, where do they come from? For we can't really hope to settle what they are, till we can track down whence they are, where their base is. For we must not overlook this queer fact. Among all the queer facts that we have to hold in our minds while thinking on this super-queer question, we must keep on remembering that though so many people have seen them — yes, and been fairly close to them — no one has yet actually come up with them; no one (who is at present prepared to go on record giving the exact place and date) has seen one land, for sure; no one has touched one and told us precisely when and where. We have to repeat, Seeing is believing, but feeling, touching, handling are knowing.

Do they never come to rest? That would make them like the fabulous first accounts of the Bird of Paradise, which was said to be so light and feathery that it could float and rest on the air. It was believed to be so buoyant that it didn't need to have any feet, but with spread wings rested on the atmosphere." Surely that is so unlikely that we need not even discuss it till we have exhausted every other explanation. And there are quite a number of other explanations.

5. There are now supposed to be no less than twefity-one ultimate particles of matter and a number of them may change themselves into one another.

Let us — as we should and must — start at home and work outward, stopping the moment that we can in honesty draw rein with all objections reasonably met. So that means we must begin with ourselves. Not only charity begins at home; but truth and all fact-finding begin at that base too.

Of course we must first ask, Are these craft home products? We have seen that most of the expert witnesses that have viewed them have not been able to get away from that base. They saw the things, they saw their astounding performance and power; but these onlookers and judges could not stretch their minds to leave the earth or even their own country. Pride of country combining with caution against fantasy brought these reflective people, reflecting on what they knew they had seen, to seek at home for the explanation.

This is the considered judgment of the famous case of March 22, 1950, when Captain Adams and First Officer Anderson saw a saucer over Arkansas. They could see over twenty miles. They were at two thousand feet. They took their time exactly, 9:29 p.m. The disk was in view for thirty seconds. The thing had no exhaust nor vapor trail. Till then they had mocked these Saucer Stories. Now, as they declared in their statement, they just had to realize this at least was true: this was a saucer right on their tracks. And there were the other features belonging to the "species": The strangest, strongest blue light they had ever seen; but in this case it blinked rapidly at the topside of the saucer. The pilots blinked their landing lights, hoping it would blink back. But it was as noncommittal as all of them seem to be. Nor did any kind of head or face appear at the line of glowing ports or windows that shone along its side. Further, it showed its vast power of speed by swooping round the air liner with consummate ease. The pilots saw the line of lit ports as the monster swept round in an amazing arc and went off — where? Yet the pilots added, after reporting all that, "We know the Air Force has denied that there is anything to this Flying Saucer business but we believe firmly that it was a secret experimental type of aircraft — not a visitor from outer space."

Well, we the public know how to make a distinction in that statement. We know that these men were so competent to recognize what their eyes showed them that they "are right in what they affirm" but that there is nothing of any evidence at all in "what they deny." How do they know this was a home product — why should they deny, contradict and indeed imply that the Air Force was not speaking truthfully? This part of their statement, any lawyer, any good jurymen, any educated person sees at once is pure supposition tacked onto clear observation. It is natural enough; but, alas, natural behavior is seldom if ever accurate, still less scientific.

The same kind of what we may call "double-level report" — of clear and open statement and then close and unfounded conviction — comes with the interview given by Captain Robert Adickes, a T.W.A. pilot. He, the members of his crew and the nineteen passengers aboard all saw, on the night of April 28, 1950, an object that for over five minutes flew alongside his plane. He tried to approach it but it too veered. It kept about half a mile between itself and the passenger plane and when Adickes turned his plane straight toward it, it made off with that easy bound with which these craft leap away. It doubled its pace from 200 to 400 mph — and left the passenger plane's company marveling. Adickes owned that till then he had been a mocker of Saucer Stories. But now what was he to do? It was of that somewhat rare variety, the cherry red complexion, and it chose to proceed (as some of them clearly do when they like) on its edge, like a great wheel rolling through the sky, at right angles to the far-below earth.

Adickes did, of course, what all people who have had to greet a shock to their common sense must do. He moved as little as he could and clamped down, even though it was on grounds that the Air Force had said could not be taken. It was a home product — it was not "a machine from Mars." But having made some sort of patched-up peace with his own protesting common sense, Captain Adickes added, "Whoever is building these things, I think they're dangerous flying around the airways. If one get out of control, it could cause an accident."

With that opinion, and on its vital importance, we can all agree. Indeed, that remark is crucial and has of course occurred to everyone who has thought about this mystery. As suggested above, it gives the strongest possible support to the authorities' statement that they are not responsible for such dangerous behaviors. A derelict at sea, an abandoned ship without lights drifting on the sea traffic lanes, is one of the

nightmare dreads of any sea pilot or captain. But such a wild wanderer on the air traffic lanes is far more deadly. A collision at sea is very dangerous — a collision in the air, at night, is just pure horror. No one in his senses, no one on earth, would permit such a violation of human safety. Experiment as you please and as you must, but who could ever entertain the thought, when the utmost care is taken with an occasional rocket that it shall fall in the desert, that frightfully swift craft would be permitted to charge about, unheralded, unforwarned on the ever more crowded traffic lanes of the passenger air liners?⁶ Only by keeping these lanes clearer than are kept any rail tracks has it been possible to keep down the casualty and crash rate so low that air travel is a safe and wise form of transport.

Need more be said to establish the double point — that these flying objects do exist and that their behavior proves that they are not home products? They are handled with masterly power by someone. But that someone, though able to avoid accidents — so far — clearly does not know the stringent rules which alone make possible safe flight, on our level, at our stages of development, with the still very rudimentary and dangerous planes in which we — poor humans in our first generation of flying knowledge — go up in the air and risk our lives.

And yet we are forced back on the evidence that "something" is up there. Perhaps there is no American whose general opinion on flying and flying machines is more respected than Captain Eddie Rickenbacker, first an ace pilot himself in World War I, then a hero of some wonderful exploits in the last war, and since then one of the most enterprising promoters and organizers of civilian flying services in the whole country. He is a man of courage, good sense, enterprise, all in the highest degree, and he is equally open-minded. He is now the active and most successful President of the big flying corporation, Eastern Airlines. And he said straight out, without a moment's hesitation on June 11, 1950, when questioned in an interview at Indianapolis: "They're real! Too many good men have seen them that don't have hallucinations."⁷ He knows how keen and critical are the sight and judgment of trained pilots. He has to — it's his job, and like all real masters he's gone through the job himself from the plane to his top chair at the head of this big company. But he added, "You can bet they belong to the United States Air Force. They're not from Mars and not from Russia."

So we see, here again, as long as the expert is speaking of the fact, the actual evidence, there he is definite and authoritative. But then he leaves the positive and takes to the dangerous ground of speculation and the dangerous side of the negative, saying what things can't be. Of course he says, "You can bet." And, if you are the gambling sort, there's nothing you can't bet on. But in this matter we are looking and must look for that high and convincing probability, that meeting of all objections which at last permits us to say no other conclusion is more likely, no other explanation covers the evidence so well.

Granted then that we take and hold to the words of authority, to the Air Force's statement that the disks are not their work — and we see this statement gains immense practical weight from the fact that such craft charging about on the passenger traffic air lanes present a hazard to the lives of thousands that no responsible profession, still less a governmental authority, would ever take — what is the next step

6. This persistefit attempt by columnists and others to save, common sense at the cost of public conscience — to say that the disks must be earth-made and indeed government-launched, although that meant that the authorities were running deadly risks with the lives of fellow citizens by launching such headlong craft on the passenger-plane traffic lanes — this argument has been again categorically refuted. Major Keyhee, because of these statements, went in July and interviewed the foremost guided missile authority in the country, commanding the Naval Air Guided Missile Test Station at Point Magu, California. This authority's words Major Keyhoe reports as: "I can toil you flatly that the Flying Saucers are not guided missiles of the Navy, Army or Air Force. No guided missile officer would be stupid enough to test any such device along airways or over cities. It would be criminal negligence — a mechanical failure would endanger lies. Even when launching a missile over the ocean, we clear the test range and keep it patrolled."

7. Captain Chiles and First Officer Whitted, it will be recalled, are pilots of Eastern Airlines and were flying one of this company's ships when they had their experience. (See Chapter Two.)

we must take, what is the next "Whence" that we must explore?

Before leaving the territory in which most of the sightings have been made — the area of the United States, southern Canada and northern Mexico — we have to ask, however unlikely it may seem: Could these craft be coming from this district? Could they be sent up into the air, and come to roost again, from some site within this vast territory? Could they be set up by some association that was not public but private, not governmental but on its own?

It is hard to think of an example to illustrate such a strange possibility. But, for instance, if there were a body of men who thought that they could manage the world better than any one of the governments of today, men who took with desperate seriousness the popular slogan, "One world or none" — might such a secret society in imitation of the old romantic secret societies — like the Medieval Vehmgericht — set itself to build such a fleet as a first step to taking over world government? The question has to be asked if we are to exhaust all possibilities. In the past such secret societies have been very powerful and once or twice nearly decisive in world politics. Hassan, the Old Man of the Mountain, the Persian of the period of the Crusades, did with a secret organization make his influence felt on both sides of the great struggle between Islam and Christendom.

The proposal has, however, only to be made to be dismissed. This continent, the forty-eight states and their environs, is flown over now day by day in every direction. Keen eyes are sweeping the ground of practically every square mile. No one has ever seen a disk rising from the ground: no one has seen a disk "homing" onto the ground, making a landing and settling down. No — they have always concluded by disappearing up into the farthest depth of the sky or out over the vast space of the Pacific.

Naturally then, as we can no longer hope to track them down on the ground flying over which they have been most often seen — the United States — we are forced to look outside. Where? Of course many people said at once (far fewer do now), "Russia." Instead of singing the old popular film song, "Beyond the Blue Horizon," they now whisper, "Behind the Iron Curtain." Suspicion is of course always credulous, for fear always magnifies and can never reason clearly. If we do so reason step by step, then Russia as a source begins to wane. For this nerves-inspired, fear-provoked will-to-believe has to disregard tremendous obstacles. "Granted that the Russians have planes utterly in advance of what we have" — that is the first requirement. It is not at all probable. For it to be so, the Russians would have to have plants far ahead of those of the United States. Just to have brilliant inventors is not enough. These disks have been produced in such numbers that very big manufacturing plants must be turning them out in high quantity. When Dr. Grimm was permitted to visit Russia a year after the war, to be able to answer those people who said, "We have given Russia much food; may we know how it was distributed?" he made a very interesting report. In it he said it was unbelievable, to those who had not seen it, the terrible thoroughness of the destruction of plants made by the Germans through all the vast area of Russia which they succeeded in overrunning. He spoke, too, of how difficult it was for Russia to repair such ingenious eradication — how, for example, in the scientific, wrecking of the great Dnepropetrovsk Power Plant the giant dynamos had been so blasted that those which could be repaired in Russia had to sent right up to Leningrad. Nowhere nearer the Dnieper — which of course is a river of Russia's South - could any plant be found able to take on such a job; while a couple of the dynamos had to be sent to America for refitting.

So the Requirement Number One can't be granted. There is no reason to suspect that Russian plane output has been able to equal, far less to outpace, that of the United States. And even if it were granted, it would only bring us to a far more abrupt and insurmountable problem. For if the Russians had such a rich variety of immensely advanced planes, then why in the name of Historical Necessity or any other principle would they be taking the absurd risk of flying these invaluable specimens, and in large numbers, over the United States? Like the question, "Could the disks be instruments of a secret society?" it has only to be asked to be dismissed. If you have a secret weapon the very last thing is to show it to your rival, the very last thing is to wave it in the sky in his face, to risk his bringing one down, to provoke him to pursue and to hint to him how he should invent, "Display of Might?" All that belongs to the dear dead days of "Fields of the Cloth of Gold," of flashing accouterments, banners of silk, gaudy uniforms,

painted prows, parades and bands. The men who rule Russia are not sentimentalists. Of one thing we may be sure about them — they never risk giving themselves away. Of all the rulers of the world they would be least inclined to give themselves away, to hint at what cards they actually may hold — just to impress outsiders. They may agree with those outside their Iron Curtain on few points, but on one they certainly do, the old adage; "A shut mouth and a poker face' wins the game. 'A stuck-out tongue and a grinning grimace' will lose it".

Besides, the disks have been seen all over the world. Take for example the set that Commander Orrego, the Chilean Naval Officer, saw whirling above his Antarctic base, and photographed. What in the name of Economic Necessity and the Inevitable Revolution would Russian planes be doing down there waltzing in the long polar day? There are no wage slaves in sweated factories in Antarctica to look up and be heartened by the promise of deliverance waving in the sky; there are no serfs of the soil toiling to raise crops for landlords and longing to own the fruitful earth and needing, as the hymn says, to be "freed from error's chain." You don't waste fuel, waste time, risk losing invaluable machines, gamble with losing even more precious secrets, by either rushing over a rival's country or spinning above the most desolate parts of the earth. Still less do you do so when those desolate parts are districts you don't control. For there your fallen gear can be recovered by others who will discover the secret of your supremacy.

But if it isn't the Russians, then who? It must be someone! Yes, that second part of the statement stands; it's true, if anything is true. For these disks are driven by intelligence, high intelligence, the highest we have come across so far. Could they be British? Great Britain certainly, all the world allows, is in the very first rank of progressive design with jet planes. But would the British Government fly its newest types all over the United States and on the traffic air lanes of that country? Of course not. Would Britain, any more than Russia, send these precious things to waltz in the welkin over the South Pole? Again who can fail to say, "No"? Britain and the United States are now closer together than any time since 1774. The United Nations is a more serious proposition for world unity than has ever appeared before for mankind. It is impossible to think that Britain would trespass over the territory of a friendly nation and in so doing risk the lives of the nationals of that country as well as the loss of the trespassing ship.

Could any other country, any of the remaining "Powers" — as they used to be called — be thought to be competent to put on such a show? Some people have said, "Spain might! Spain gave sanctuary to some Nazis."⁸ Probably Spain did. But even the most ingenious Nazi (and the most ingenious were not those one or two "possibles," right at the top, who may have got away), even the cleverest man, can't work without tools. Could any designer make this number of craft and this variety in a country not industrialized? Spain has always been a backward country. She imported most of the weapons to fight her intensively destructive civil war. Could Spain today, with the help of a few refugee Nazi brains, sow the upper air round the globe, and in flights over the United States, with super-original aircraft — Spain, who never produced one super-successful car to compete on the prewar world automobile market? Again we have only to write out the question to see that it is answered. She couldn't.

Italy or France? These two at least did produce much fine and pioneering automobile work and some interesting planes. They had and have some plants — though the Italian were terribly damaged and the French have not been able to keep at all near to the American spurt of production, even considering the different scales of the two countries. No, all the bigger countries of Europe are out, now that Germany is still in two pieces.

8. On May 14, 1949, this view was publicized by the *Washington Daily News*. This paper held that not only were the disks at last beyond dispute as a fact, but that they were not Russian. They were Spanish-Nazi in origin, and also, in structure, were a new "gyroscopic" design. Walter Winchell, the famous news commentator, in his syndicated column allowed the gyroscope but denied the geography, lie had already gone over to the Flying Saucers as a fact and not an illusion. With rightful triumph therefore, he stated on June 5 that the *New York World Telegram* had, after some weeks, confirmed his judgment. For this paper maintained that the Air Force had just secured a picture of three disks. They had appeared flying together over the Newfoundland transatlantic air base of Stevensville, and when chased had easily outdistanced their fastest pursuers.

Asia — outside Russian Asia? Outside the Iron Curtain we know that Asia is still to be industrialized even to our present pitch of motor manufacture. The same is true of South America. Japan has long been under complete surveillance. There remain South Africa, Australia and New Zealand. And to them what was said of Britain applies — with the further demurrer: none of them is industrialized to the pitch of Britain. Indeed all of these three are very lightly equipped with armament production plants.

And now we have gone round the world. Forced from finding any perch for these flyers in the country over which they have most flown, we have sought round the whole globe. We have found witnesses of their flights all over our sphere but nowhere have we found any place from which we can with any real conviction say that they arise and to which they return. We can find no "Whence" for them anywhere on the whole earth's surface.

And further, we now know that the disks do not have merely a "performance" (a pace and a capacity to maneuver) we do not command. They have a powering which is even more mysterious. If the air-pilots quoted in this and earlier chapters had had Geiger counters on board their planes when they encountered the disks and tubes that flew about them — when these air men had noticed (as they would have had to notice) the counters double their speed of discharge — they could not but have realized that they were in the presence of an utterly unknown vehicle and in the field of an unprecedented power. They would then surely have been a little less inclined to say, "Of course, these things are ours, a new secret weapon we are trying out."⁹ For everyone knows that one of the reasons for using a Geiger counter is to warn you when you may be coming into contact with powerful short-wave radiation, which you can't feel, but which is deadly if you continue to be exposed to it: The question raised by the Geiger counter's findings is: How can any human being, or indeed any creature live in or near such an intense radioactive field and not be killed. How do the saucer inmates screen themselves from such deadly danger. They must have not only a power unknown on earth — at least in the form they handle it — but also a metal, or material, unknown on our globe. Or, maybe, they have a physique so different from ours that radioactivity which would be fatal to us, is harmless to them. We must then repeat, this further piece of evidence would seem to confirm the fact that we can find no "Whence?" for them anywhere on the surface of the earth and that we do find that they have a powering deadly to any form of earth life.

Let us be certain of that, for that certainly is a very grave finding. We should not, we could not, give up the search to find for them some foothold, some resting spot, some production center, until we have gone over the whole globe. There are no secret places now upon our earth. Our eyes have now scanned — and in a few hours from any center can rush up and out and scan — any spot on the whole surface of our planet. No wonder, faced with that fact, we try to avoid the evidence that flying objects (that have no place to "home" back to) do ride the skies. No wonder, when the evidence forces us to own that such sky-riders are up aloft, that we fall back feebly on what has been denied — that we say, "We must have made them though we don't know that we did."

At this point of the story we must then pull ourselves together. We must recall that we are dealing with evidence and its interpretation — two different, though always closely combined, things. We must recall that all we have to guide us in finding out anything in this world in which we find ourselves — and in which every man ever born has always found himself — is probability. Sometimes it is so high that we can say we are, for all matters that matter, certain. Sometimes the probability is only such that one's opinion has to wait, putting the data in a suspense account.

Of course it could be possible that some out-of-the-way tribe had made these things — but it is so wildly improbable that we can safely dismiss the idea. Of course it may be possible that some home-production plant has made and is making these things, for we must remember that anything is possible —

9. We must however note that Flying Officers Nash and Fortenherry (referred to on P. 64) did say, "because of the way the missiles" (tire flying disks they viewed) "acted... they must be from some extraterrestrial source." This is an interesting advance in flying men's opinion and shows how the weight of evidence is beginning to tell in forming the judgment of men most competently informed both as to what has been seen, and as to whether any earth craft could duplicate the performance.

save some propositions of logic, and of even that the logicians now don't seem to be so sure as they were. The Universe has never given us a set of rules and said it will never break them, nor given us a guarantee that it will never produce anything but what is in the list. But it does seem clear that probability now forces us to seek for another possible place where these ceiling-cruisers could come from. Not till we have searched really everywhere have we the right to say, "I have absolutely no idea," or, "I don't believe one word Tin told." Neither the denial that we make them nor the declaration that they exist, they have been seen, really lets us rest.

But if there's no place for them to "home" on the whole earth, then, in the name of Noah's dove, where can they find an Ark to which they can return to roost? They cannot spend all the time circling above... Or can they? Well, till we can track them down — or up — we must take any further clue from what we can discover about their performance. An arrow tells you something, if not much, about a bow; and a bullet, to a ballistics and gunnery specialist, says something about the type of gun that fired it and the kind of force that drove it, and so the distance it may have traveled. Before, then, we raise any more "Whence" queries, we must go carefully over our ancillary evidence. "From the foot you can deduce the stature of Hercules," said the Greek sculptors. And there was an older saying, "From one claw you can construct or imagine the lion." From our study of the craft we may come to be able to deduce the type of port and even the shipyard base from which these super-argosies have sailed.

CHAPTER TEN

The Craft and Their Power

THE first thing for us to get clear in our minds is the range of craft with which we have been presented. Indeed, as we have seen, the name "Saucer" or "Disk" may soon cease to be suitable as a general or generic name for this kind of air visitor. It does describe the all-over appearance of a common type — as you may say that most things that swim in the sea are fishes, but you have to add there are things swimming in the sea utterly unlike fishes — e.g., the octopus. So in the upper levels of that air-sea — the atmosphere — on the floor of which we crawl, we are now gazing up at the hulls of cruisers of very different patterns.

As a start, however, let us take that species we call the "Disk" or "Saucer." It certainly has a handsome number of varieties. The first sightings were made in June, 1947, by Arnold of Boise, Idaho, from his plane. He judged, by gauging them against the mountain peaks, along the ridges of which they were flying, that they were twenty miles or more away, and then, as he could compare them with a large plane, a DC-4, that was flying in the same circuit of his vision, he estimated that the disks must be somewhat smaller than that plane. His second sighting, on July 30, at 7:00 a.m., when he was flying over Oregon, showed him several small disks — he judged these to be not more than two to three feet across and light brown tint.

The famous sightings — famous because made under such perfect conditions — at White Sands Testing Grounds, New Mexico, in April, May and June of 1949, confirmed the existence of these two types. There is a type which is about one hundred feet across and with it was seen a far smaller type. In the famous June observing, the two small disks that examined the uprushing rocket and then put on such an amazing acceleration-leap when they outpaced the rocket and shot into the depth of the sky, the theodolite readings gave as not being more than twenty inches in diameter. The one sighted in May seems to have been the same size as the one sighted in April — viz., just over one hundred feet across. There may be one a little smaller than this. For the other theodolite observation — that by the surveying team at Ernmatt, Idaho, on February 20, 1948 — showed a craft about the size of a small plane (Piper Cub plane). An extremely accurate sighting, prepared by an expert for the Air Force, gave the dimensions of a disk which he and another witness watched hanging at 2,000 feet above the earth (height gauged by the DC-6's flying at a similar altitude) as being 100 feet in breadth and some 30 feet in central thickness.

Then there are varieties of the shape. Some seem to be disks, saucers, plates — flat circular objects. Others seem to have a bite out of the side which appears to be their stern. The thing that flew

over Phoenix, Arizona, had such a bite — or seemed to have. But the bite effect may be given by streaks of fume emerging like widespread twin tail plumes. The Emmett disk had only a kind of foam gathering at its stern as it flew, and the observers thought the stern indentation resembled the sharply incurred aperture given in the conventional pattern of the human heart. The thing was flying with the point or "base" of the heart directed forward — like a rather "obtuse" or blunt arrowhead. It is notoriously difficult to judge of the size or even the shape of objects high in the sky, especially when they are moving rapidly, unless you can range an instrument on them. But in these cases we see that the observations made without instruments were very largely confirmed later by those who were so equipped, and trained to use them.

To these we must add another important sighting not mentioned in this summary so far, but which will be noted again when we return to the problem of "Whence?" At Flagstaff, Arizona — where the climate is so good and the atmosphere so clear that the Harvard Observatory was placed there by Lowell, the famous astronomer after whom the Observatory is named — Dr. Seymour L. Hess, the resident astronomer, on May 22, 1950. reported to the paper, the *Arizona Daily Sun*, that while studying weather conditions he had seen a bright object, a disk visible to the naked eye. He then trained binoculars on it. Convinced that it was not a plane, at least of any known type, he was able to make sure of two other things. It was cutting through the clouds, and could not therefore be a weather balloon, for that would drift with the wind. Further, looking at it with "four-power" binoculars showed that the object was some three to six feet in diameter. The time was 12:15 p.m.

To finish with the cut and contour of the disk variety, there are the best photos so far, those taken by Paul Trent in Oregon. These two photos have been reproduced first in the *McMinville Telephone Register*, the paper of the town outside which Mr. Trent has his farm. Then they reached the foremost of illustrated weeklies, the New York magazine, *Life*. And later they were printed by the *London Sunday Dispatch*. They show a disk, but with a small central "mast."¹⁰ We need to add, so as to be able to go on, with all the information we have, to the next section, "The Craft and Their Power," this further point. This saucer, like the rest, cruised about "noiselessly" and left no vapor trail.

Then we come to two mass observations, where crowds saw an object and watched it for some while. These two cases are perhaps the most important of all the sightings so far made. The first is that which ended with the tragic pursuit and death of Captain Mantell. There, as the reader will remember, the object was sighted first by State Police as it came up the sky and paraded over Kentucky. The State Police alerted the Military Police. It was traveling in the direction of the Goodman Flying Field. But while still nearly a hundred miles away, in the town of Madison-ville, many people had caught sight of it in the sky. Still the really important fact about these findings is that they were made simultaneously by so many people *so widely scattered*. More than a hundred and fifty miles apart, people looking up saw the same thing, the same odd object in the sky. What does that mean? It means — a very simple form of triangulation will show — that the object must have been vastly high. And if it was so high, it must have been of enormous size to have been visible at all to the human eye. In fact, there seems little chance of escaping the conclusion that this was the vastest airship ever seen, save perhaps one other case, to be mentioned in a moment.¹¹ This was a very mother of disks, and perhaps that poetic phrase may be quite

10. Here we should also remind ourselves of Dr. Craig Hunter's viewing referred to earlier (see Page 8, Footnote). Dr. Hunter viewed the object from almost vertically underneath. Hence he was not able to see whether this small mast, that shows in Paul Trent's photo, was in the center of this craft's upper side. Dr. Hunter was, however, close enough that he could see a circular spinning rim that revolved round the center of the disk. This revolving rim seemed to be slotted. He also observed a long pennant flying from the rear — perhaps some sort of aerial.

11. There is also a *third* sighting of a "monster," given in one of the "releases" of Project Saucer. But, like the theodolite evidence cited by the same course, this "monster" report lacks clear detail. We are told that an unnamed man who holds a private flying license saw a vast object flying toward him. He first thought it was a normal earth plane but saw when it came closer

near being an exact description — perhaps it was the mother ship in which the smaller craft, like dinghies hauled on board a schooner, can take refuge after their exploratory flights, as Noah's dove came back to rest in the Ark. It may have been anything between seven hundred and perhaps a thousand feet across. Such a thing needs quite a lot of evidential support. even when we have allowed that disks a hundred and more feet across do ride the skies.

And on March 22, 1950 — this is the second case — a perfect observation of this or a sister monster was made. Idyllwild is a charming resort on the slopes that rise to Mount Jacinto — the ten-thousand-foot mountain in California that stands sentinel between the inner desert and the outer coastal belt, a couple of hours' motor run SSE. of Los Angeles. Visibility is generally good there. The little town stands high, the air has a desert clarity. Many people go there. A number were out, and many were watching the sky, for a couple of jet planes were practicing high up. The performance of these craft is still so remarkable and novel to all interested in aviation that when they are lunging through the sky most people will give a few moments off from their earthly and close-up interests to see how these "man-manned super-bullets" are making and mending their pace. They are so near — if not right upon — the very growing edge of our speed ambitions. There, as far as the public knows, lies (if that is not too slack a word) the real, and now so very literal, armament race. The sky, the upper sky, is now the world track for the greatest "Marathon" ever run — a race in which we may, in the end, run so fast that we shall (again literally) run ourselves out, run ourselves off the planet's surface, out into — what unfathomable night?

In the crowd — there were perhaps a hundred people in that clump — were two who were peculiarly qualified to take an interest, a professional and expert-witness interest. They were Air Force sergeants. And they both had had a peculiarly appropriate training in keen observation, even for Air Force men. Bill Elder — who as it happened was the elder, aged 25 — had served in the Navy in the last war. He'd time and again served as lookout man when, at the finish, the desperate Japanese tried to hold back the closing grapple of the American sea and air forces on the home islands by sending up the famous "suicide pilots" to swoop down "out of the sun" and crash themselves on the deck of the battleship, hoping — like the old-time anarchists — to destroy their victim in the explosion that obliterated themselves. So he had keen sight, his vision perfect, his judgment trained. His companion, Bob O'Hara, who is four years younger, had had an equally intense training. For he had been "spotter" for the Air Force in air-sea rescue work — scanning the blurred or dazzling surface of the ocean for the tiny, darkish spot which is the head of a man, perhaps at that moment sinking. And these two were watching the jets through field glasses — those modern field glasses that cut glare and give such amazing visibility.

So it was that, far above the jets, far above their trails of exhaust, the two trained watchers and all the rest of the crowd saw, riding the upper air, a huge disk. The two "spotters" thought it might be at least 40,000 feet up. They note that it could have been no balloon, however tremendous, for the simple reason that balloons can't go against the wind. And this one was going against the high wind shown by the drift of the vapor trails of the jet balloons. Besides, it was too vast for any of the weather balloons, which are of course of standard sizes. Further, it showed that queer complexion which the large disks have been found so often to display. It was shining silver, as though of metal, but the underside gave off that warm rosy tint noted in a number of other cases.

Another fact that makes it clear that the object must have been at a tremendous height was the very long while it was in sight. It was said to have been observed altogether for some four hours. People not at Idyllwild saw it. In one place a tripod telescope was ranged on it. Of course it may have been far higher up than a mere 40,000 feet. Probably it was riding at those scores-of-miles levels where air thins out for good, those super-levels at which the White Sands observers were able definitely to calculate that

that it was perfectly round and flat and that it emitted no sound. He gave its size as of the bulk of six human planes, each the size of the large plane called a B-29, and its speed as three times that of a jet plane. All that such a report leaves us with is that someone who may have been a good observer saw something that was very large, pretty certainly a disk, and that it was going faster than any plane he had ever seen before. The State over which it was sighted was Oklahoma.

their visitors were able to ride.

The two trained watchers at Idyllwild, however, were certain of two things: One, that it was a craft they had never heard of, still less seen (they added a caveat that they were not to be thought to suppose that the thing might have come from outside the earth). The other thing does add another grain of knowledge to our all too scanty information. They were quite sure that the thing was a big, thick pancake. That, of course is the disks' standard figure. But what is not standard is that this one seemed to have a hind fin sticking out of it. The description sounds like that of a sunfish on its side. And, they thought, this great fin "whirled." Could that fin have been the fume or smoke that the monster that rushed across Kentucky showed? It certainly could not have been a paddle or oar of any sort. One thing is clear — these super-ships do not need any sort of blade to push them along. They are as much beyond the jets as the jets have gone beyond and left as obsolete the old propeller type of aircraft.

Then there is, right close down at the very end of May, 1950, Captain William Sperry's account of another craft which may not fit into any of the above categories. He told the National Airport at Washington, D.C., that, seven miles west of Mount Vernon, in the State of Virginia and at 7,500 feet, he found that his craft (one of the big DC-6's, a speedy plane), which he was flying with passengers for American Airlines, "was having — literally — circles run around it by-----? He called it a "submarine with lights."

We'll get back to that in a minute. What we can note at once, for it is without a doubt, is that he said this thing actually circled his plane twice. His pace was about 300 mph. So this giant "cigar," if one may so christen it, shows, mechanically, tremendous speed and masterly maneuverability. You don't go looping and relooping in front of the prow of a plane itself going 300 mph unless, in the graphic Irish horse-racing phrase, "You have the legs of her." And as its mechanical prowess shows the machine's capacity, so its actual performance tells us something of the psychology of its rider, its pilot. He certainly was curious, showing more curiosity perhaps than in any other of these cases. This was the clearest proof up to date that whoever is looking in is wondering about us and trying, with a careful combination of caution — as far as he can pick up our rules — and of curiosity, to find out what we can do and how we behave.

As to what the actual shape of the thing was, surely we can say it was probably not a disk. Far more likely, it must have been one of the long tube type with its rows of lights and that weirdly lit fore-cabin. For that is the third clearly defined type. During last summer these were sighted several times coming in over Catalina Island, south of Los Angeles. One of these visits synchronized with the explosion of an atom bomb in the desert. We also have the seventeen minute sighting made by Captain Bicknell in his flight with ten other people as they approached Mount Kilimanjaro in Africa, a perfect account of one of these monster tubes seen by day.

Finally there are the rings, the scanners. And, perhaps we may add to the list of detection devices, the hanging light which seem to make themselves into temporary chandeliers.

We need all we can get to help us on this second point of our enquiry about these craft. Of their shapes we have some idea. Of their pace or paces, of their range or ranges of speed, we have some further notion — though here again, when almost any pace seems possible, from a quiet brooding to a speed of 18,000 mph, we are almost lost in the lack of limitation, almost left without power of proper speculation because so embarrassed by the wealth of possibilities. The power of acceleration is, too, so far outside of the terms in which we think of possible travel, that our minds can hardly order the findings of our senses.

No, we must be very patient. For no wonder people who are brought up on textbooks (which are always closing subjects by such sentences as: "Science has now shown finally that this, that or the other thing is wrong and can't be done, and means only this, that or the other") feel that any object that breaks the rules of deportment laid down for objects, by those who thought they knew what all objects must do, just can't be. The farmer who on his first, and last, visit to the zoo, having gone there quite unprepared, saw suddenly looking down at him a giraffe, said quietly and firmly as they gazed at each other, "No, no, there is no such creature!" He had known livestock all his life and no doubt quite often when a child had had nightmares of cows as high as houses, horses higher than the barn, So when he met this thing from

Equatorial Africa, he referred it to the category of experience where he knew it belonged — dream, wild dream.

Certainly the power problem is the next big step our minds have to deal with. More than the craft, this question of their speed seems to rule out any human designer. How are they driven? Well, first, to start with the simpler problem, it would seem that some are not driven of themselves. They may be remote-controlled. That possibility has already been established in our minds by our human experiments in the field. But we must remember how odd it is — the idea that objects which seem to be directed by someone inside them, which show a human way of avoiding this obstacle and seeking out that object and target, are really being directed by someone far away whom you can't see, and by intangible "fibers" of control — in other words, by rays, by radio.

The "light" that Gorman chased at Fargo above the flying field — was there any plane bearing that light? Perhaps a transparent "lantern" did bear that intelligent will-o'-the-wisp. But it certainly behaved with a freedom, dash and rush that would suggest that so small and maybe tenuous a thing was not "manned" itself. It was being bobbed and whisked in front of the flyer's nose as an angler high up on the bank, and standing in another element (air), whisks and bobs his bait in front of a submerged fish — though in this case we must remember that the "remote control," the putative "angler," did show a consideration for the "fish" that we seldom do. But, as we shall be seeing in the next chapter, it is really impermissible for us to say, "The craft was so small, the speed so great, the twists and lunges and kicks so deadly violent to anyone inside, that, of course they can't be 'manned' — no intelligent creature could go through such a milling and live, let alone get inside such a small craft, say a couple of feet across, in the first place!"

No, our minds may have to be stretched still further; meanwhile, in preparation for that painful process, let's try and keep them as open as we can. We must not shut down. If we do, we may have our minds wrenched open too violently for their peace and maybe for their balance.

So to turn again to this pretty problem of power — of powering a plane to remain poised and to go at 18,000 mph, of powering a plane to fly at over fifty miles high, of powering a plane perhaps over a thousand feet across, of powering a plane that evidently never comes to earth but rushes round the globe as though it were a tiny satellite of ours and that takes refuge when tired — if not in itself, perhaps of us — not down on the earth but up in the sky.

And have they ever been seen in trouble, are they flawlessly efficient? We cannot say for sure that, for some time, anyone saw in anything which could be called trouble a disk or a tube or a giant globe or even one of the "small golden globes" that were now and then reported as bobbing about near planes in flight. Then came "a lone observer" from the woods of the Northwest saying he thought that one had dropped into a lake or at least dropped something into a lake. This, again, is vagueness itself. Granted the disk was there, granted it dropped something, that might be a matter of furnace cleaning. And how tidy not to let the ashes fall on the earth, where they might have caused a forest fire, but to find a neat sequestered lake and there deposit the refuse!

What seems more important is a U.P. report from Seattle, Washington, on April 29, 1950. Thirty employees of one of the city light substations (that is a good bunch of witnesses) all declared that they saw a double-decked balloon moving majestically, unhurriedly through the sky. Then while they watched it sailing over South Seattle, it exploded. The witnesses informed the police. The eyewitnesses indicated the area where they were sure they had seen fragments of the "ship" coming down, settling toward the earth. An area of some sixteen city blocks was indicated. The police, with firemen to aid them, searched the whole of this area. Not a vestige of anything odd, or that could have been exploded and let drop, was to be found. What is one to make of such a report? Do these creatures of the upper air, when they feel their end is near, break up and then dissolve so that by the time their fragments have reached terra firma they have volatilized into invisible gas — "and like this insubstantial pageant faded, leave not a wrack behind"?

All we can say at this point, and when we are considering these objects' power, is that any evidence that even they on occasion falter and fail is almost the weakest part of the whole witnessed story.

But we have a possible — just possible — clue that they do get together now and then and that this getting together may be to pep each other up, to do some kind of recharging exercise. The first case comes from Idaho again — Idaho, that rather out-of-the-way State once famous because of the religious conservatism of its inhabitants, the kind of place where farmers farm for six days and fundamentalize on the seventh. Idaho certainly has taken a leading part in observing this kind of phenomenon. Remember that case at Twin Falls — that was in Idaho. That disk was sighted by a couple of observers and they thought it was sky-blue, and it was fairly low down. Further, though it did not seem so low down as all that, the treetops were, when it raced over them, what the ballad calls "in trouble," like the famous trees on Wenlock Edge.

Now that very same day, at a place called Salmon Dam, again in Idaho, two miners were made to look up at the sky. They weren't sky-gazing, admiring the clear air — miners, one supposes, generally have an earthward look. But they had good hearing. And what they heard set them looking about. The sound was a strange one as well as loud. It was a roar but an unfamiliar roar. It was coming from the sky, too. Then they caught something, glimpsed a flashing object in the sky. They both were clear about it. Two disks, very bright, so bright that they reminded the uplooking miners of mirrors spinning round in the sky, were waltzing away in what seemed an excess of speed and energy. Let us not comment yet until we have repeated the description of the Chilean Commander Orrego, stationed down in Antarctica and gazing aloft into the lit "white night" of the South Polar summer: "We saw flying saucers, one above the other, turning at tremendous speeds." For fun? Out of the wild joy of living, having a day off from the weary work of cataloguing our dreary cities and trying to make sense of our sooty web of things? Or have they a reason for so behaving, have they a need so to behave?

Glance back through the findings as to the signs of energy which they give, the giveaway trails and smears and vapor wakes and sky smudges. We do know that the huge thing over Tucson, Arizona, did puff and pant in the true old-fashioned combustion engine way. A long stream of fine smoke, as when the combustion is high and the furnaces are clean, and then a puff of denser smoke when brought to a pause, as the master of this giant craft considered Tucson from the sky. And the even huger thing that raced across Kentucky, that, too, was said to have glowed fearsomely from its stern. Perhaps the huge "paddle" seen by the Idyllwild observers, with the two air sergeants to help, was some kind of hind plume of smoke. But the first theodolite observation — again an Idaho prize, the one made at Emmett — that showed only a little foam round the stern, like the foam on a chin about to be shaved. And most disks have shown nothing. Some of the tubes do show a good, fine, kicking and splashing flame. (The Kilimanjaro sighting, of course, provides the exception.) In such cases we may say that we are — as far as theory is concerned — if not on the level or well within our depth, at least not hopelessly out of it. This is jet propulsion ahead of ours but evidently along the same path — maybe even the frothing heart-shaped disk seen by one of the first theodolites to settle its eye on a disk was a fine form of some super-efficient fuel. But the silent flitting of nearly all of them gets far more mysterious when to it we add the lack of any visible exhaust, any smoke.

So now back to the dance. The one that was seen to take place with a couple of disks over Salmon Dam, Idaho, occurred the very day that at Twin Falls in the same State a single disk had been seen comparatively low down. Now was that disk in trouble, as it made the trees twist and writhe as it passed over? Was its color, which had sunk from the usual flashing white to a blue, a sign of depletion, a magnetic anemia of its system? And when the two were seen together, flashing like mirrors, surely that was brighter than they are usually described. They are said to flash white, but this blaze as of a mirror in the sun is above the usual "albedo," as astronomers call the brightness quality of the planets and asteroids they study.

Shall we for the moment assume that the two had just raised their temperature, made their strange circulation brisk and equal to scaling the sky, by having a whirl round each other? Whirl two objects, each of which is a "coil" properly "wound," and what happens? It is as familiar as, at base, it is mysterious — electricity is generated. Are these disks thus recharging each other? Right down at the South Pole were they caught at the same game — where perhaps they thought no one would be on the lookout (the case

at Salmon Dam may have been an emergency "transfusion" or artificial respiratory exercise).¹² Beside, there might be another reason for going off to the South Pole. Long ago Dr. Gilbert, the able physician to that odd old invalid, Queen Elizabeth, and also, on the side, one of the fathers of Electrical Science, made a remark which, considering knowledge at his time, was amazingly penetrating: "The Earth itself is a Giant Magnet."¹³

Now today the struggle to find out what the relation may be between electricity, magnetism and gravitation has reached a new crisis. Einstein, as we all know, thinks he is on the verge of getting — indeed may have — the formula that will settle that. When we remember what came, in so few years, from Einstein's first big breakthrough in the world of ideas — the notion that matter and energy are really two aspects of the same thing — we must have a certain awe when we think what might come of the alliance which we are trying to arrange in our minds between gravitation, magnetism and electricity. But if it is the next step and if it leads to power (as all knowledge seems to do since that vast, low mind of Francis Bacon drove that utilitarian obsession into our heads), well then, people who are so far ahead and on the same line as we, as far as travel is concerned — such a people with such craft as we have to admit they have would power them, wouldn't they, with some form of super energy? Indeed, now that we know that disks do give a superkick to Geiger counters we have clinching proof from skilled observers first, that Fred Johnson was a good observer when he noticed that his compass needle was whirling, and secondly, that with this radiation detection we should realize that we must be on the track of the disks' tremendous, out-of-this-world powering.

One of the things, indeed the basic tiling, that makes flight so hard and kept us down on earth so long, was, and is, just this mysterious but ever present drag, gravity. What if magnetism is, as it were, the other pole of gravity? Every force seems to have its complement in this middle cosmos of balance and of action and reaction. The magnet is there before our eyes every day and we know that negative and positive electricity seem to be the very basis of everything that gives us the sense of touch, of everything we can see and handle. Can it be that these disks (and other super-sky craft) with their super-performance, with not only their appalling speed of 18,000 mph but their ability to demonstrate that dream of all airplane designers, a craft that will hover in the air silently as long as it wishes at any height — can it be that they have the power such a performance seems to demand, the power to resist gravity with its counterforce, a negative reaction to the pull of the earth, as on the negative pole of the magnet objects are not drawn in but driven out?

At any big show of electrical experimental gadgets, for years it has been a standard pretty "conceit" to show an object of weight raised and held in what seems empty air — because a suitably arranged magnet is holding it up. This toy the disks' masters have perhaps now mastered. And maybe they go to the South Pole because down there, at that end of the world magnet, they can recharge themselves best? Theory of course, but theory in an attempt to make the actual observed facts at all digestible — as doctors say of patients who cannot keep food in their stomach — to make it possible to retain what observation is ramming down our unwilling throats.¹⁴

12. And compare this with Fred Johnson's account (see Page 6), where, while he watched the half-dozen disks up above him in the Cascades, his compass needle whirled.

13. Later we'll be seeing that recently we have discovered that Mars is a magnet too.

14. There are two further comments to be added to this account. First, as to the actual reports as given above: It will be noted that when the two miners at Salmon Dam saw the two disks whirling round each other, their attention had first been roused by a roar. These disks then, though generally silent, when in this joint relationship emit sound. This would lend support to the supposition that the maneuver which the miners witnessed was of some particular importance and effect. Secondly, another very important sighting has lately been reported. Mr. D. W. Chase, a radar technician, has informed the magazine *True* — and the magazine *Fate* has also carried his report — that he has twice himself had good viewings of the disks. His first sighting is the most important for us at this point of our enquiry and attempt to sift evidence. For he says that it took

Of course such masters of the magnetic disk would be ahead of us. If they have that sort of plane and that sort of power, then we cannot escape the conclusion that they are so far ahead of us that we may begin to see why it was impossible to find their homing site in any of the countries of the world. And now that we have considered the craft and their power, what are we to do? Have we any other possible guide to help us return to the "Whence?" problem, or must we throw in our hand and say, "Spontaneous, cataclysmic generation, if you like — that, or some forgotten spell of Merlin, that someone has found and is muttering to himself!" Let us, before we cry, "Anything may happen anywhere, so why try to order or argue anything?" — let us try and see if we can put two and two together. For now we have two suggestions to make about the disks and their companions: (a) that they may have a mother ship or ships high aloft; and (b) that they may be able to resist gravity when they are low down (and not acting as satellites of the earth and so getting a free ride on the outer rim of our rotation). From these two possibilities about the craft and their power we may go on and make some deductions as to the crews and their views.

CHAPTER ELEVEN

The Crews and Their Views

WE SHALL have to start at the wrong end, if the right end is to find the creature and then to study his behavior. We can't expose whoever — if anyone — is inside the disk or the tube or the globe. They certainly are safely encapsulated in their husk or shell, and perhaps have to be. Certainly when you are going at 18,000 mph you'd have to be shut up pretty securely if you are made of anything that we call a body, a living body. So we shall try to find out their views by watching their muffled, if magically swift, behavior. And to find out their views we shall be on safest ground — where all seems terribly up in the air — if we try and gather what it is that they seem to view. "Show me your tastes and I'll tell you your character," is an old and obvious motto. What are they interested in? For our interests do, as it were, cast a shadow of our minds.

We have only been watching them a couple of years but already it may be that their interests have shifted a bit. Or perhaps we have — it would be the better way to put it — made them shift, jolted them out of a rut, made them brisker. When birds are on their own and haven't been disturbed by man, they are far more unwary and casual than after our presence has caused them to keep out of the way, or at least observe their proper distance. When the disks were first seen, some of the most interesting sightings seemed to suggest that they — or their directors — might be in a contemplative frame of mind. They brooded quite a bit, hung above and gazed down.

A good example of this was a report of an event during the last week of July, 1948. The first story, handled by the United Press and afterward carefully vouched for, came from the peaceful and somewhat out-of-the-way town of Alice, Texas. Five reputable citizens saw it. That's enough but nothing big. What was the big and strange thing was the time, the time it stayed on view. It seemed simply to have anchored itself aloft. For nearly two days it chose to be on view. It was spherical, and gave off very

place on July 7, 1947, at 3:20 p.m., some five miles south of the town of Medford in Oregon. (There is a comforting accuracy about the statements of this technician, it will be noted. But let us not blame so many other reporters for a lower standard of precision. Whenever average men are taken by surprise by a startling anomaly, their power of detailed observation is nearly always blunted.) As he points out, there was perfect observation, for the sun was behind him in the west, while the disk was obligingly flying from south to north along the viewer's eastern horizon. The disk was in view from sixty to seventy seconds. It was viewed through a course of 150 degrees. Further, the disk was running on edge like a wheel (and some do, we have already noticed). The main surface was therefore exposed to the watcher. He notes that the disk shone with the dazzling blue-white flash of an arc welder's light. This must have been its own power radiation. For a polished surface reflecting the sun as it approached the western horizon would have given off an orange-yellow flash.

little light. The observers came to the conclusion that it was some five thousand feet up in the air. At last planes were sent over to investigate. But by then, perhaps not unnaturally, "the patient watcher of the skies" gave up his vigil.

Still we may ask, Why did he wait so long? And we may add another question, more pointed: Would he now be permitted to ride quietly on the sky? The answer to that latter question is, of course, No. At least so far as the United States is concerned. There do seem to have been during 1952 some sightings of long duration in Mexico, especially above the capital. A medical student from Mexico City told me that he and a number of fellow students saw one that hung high in the air for hours. A traffic director for air lines entering the city zone also confirmed to me that incoming pilots reported the presence of this craft. As to the first question of his lengthy brood, can we ask ourselves what it is that these visitors want to find out? Obviously they are seeking information — there is no sign that they are planning invasion. They have let much of the advantage of their position slip away — the element of surprise has been permitted to evaporate for two years and more.

Let us then deduce what we can know about them from their machines and then from that try and construe their maneuvers. Are they at all like us? Yes, they are, and in some wonderfully reassuring ways. Maybe, after all, it is good that we can't see them, for we can the better judge them (in the interval) by their acts. For their acts are those of — one says it advisedly — very circumspect, very intelligent gentlemen. There is everything to support such a reassuring verdict and nothing to tell against it. That their intelligence is day-bright, of the highest standard, of the most penetrating insight and understanding, it is hard to doubt. All that we long and strain to do in the very height of mechanical and dynamical research seems in their hands, at their feet. But to this is added a considerateness that seems equal to their power. We have to start that last sentence with "But" when we ought naturally to begin it with "And." For in the squalid world in which we squirm, hiding our heads in the sand, filled with panic fear at our fellows' possible triumphs in "winning power over the environment," we can't think of power as anything but added peril, a fresh temptation to mutual slaughter. So we have to say "But" instead of "And" — as though compassion, patience and the wish to understand were the op-posites of, and in eternal conflict with, the capacity to do what we want and to control circumstances to fulfill our aims! Except for the sad accident in the Mantell affair (and then the great ship was in headlong flight from its midget pursuer), these visitors have always not only tried but succeeded in giving right of way and getting off anyone else's tracks. They have behaved with a deportment which shows not merely savoir-faire but real considerateness. Let us then, when trying to track the paths of their enquiries, see a little way by asking ourselves what we should do if we possessed power that made us considerate and not proud, wise and not paranoiac.

Well, if we came upon a people much behind ourselves we would behave — as, thank heaven we have in some cases, since anthropology has come in, on our meeting another culture — we would conduct ourselves with patience and courtesy and wait for those into whose presence we had come to let us advance. Meanwhile, we should be quietly observant and see how much our eyes could teach us about the character of our involuntary hosts.

If then these visitors had — and had to have — their first views of us from a very considerable distance, what would be their first conclusion? We have some idea of that. We have now a self-portrait of our geographical appearance from one hundred miles up. Secured from a film sent up in a rocket, it showed a great stretch of the Southwest of the United States. You could recognize the Gulf of California into which the Colorado River flows. But of course no hint appears on that, the first true and actual large-scale map, that this vast stretch of land has any occupants. With the best magnification and the clearest lens, our proud cities would perhaps show as an ambiguous stain on the landscape — not so striking as a spot of a "mosaic virus" infection that mottles the surface of a leaf. We ourselves, — "the measure of all things," "the crown of creation," as we have with modest self-awareness named our presence, — we should be far less prominent than a louse is to us.

As, then, any visitor from far up aloft came "careening down," he would first see our stain-towns. And then, as straight lines, however fine, of amazing narrowness, have a wonderful way of showing up from great distances, he would see the arterial roads leading to these stains. Anyone aware of plant growth

would suspect that they were being presented with some sort of low lichen, but one that spread a fine filament system of roots over the surface of the ground to feed its center. To understand this one form of rather ill-ordered and obviously rudimentary living organism, he, the explorer, would watch with care these rootlets. Even if they did not grow quickly enough for that growth to be seen, he might hope to detect some kind of circulation of fluid to and fro in these veins. And the observer would be rewarded. Minute objects did slowly percolate up and down these fine channels.

Coming closer to study this, the first signs of life on an otherwise apparently dead world, the watcher would next perceive the nature of these crawling protoplasts or germs or circulatory free-moving cells. He would see, as curiosity drew him daringly closer to the surface of the planet, that they were low organisms, crouched close on the fine runway or duct. He would then perhaps be close enough to see that though they moved very slowly they could not keep going for long. They became exhausted evidently, yawned open along their sides, discharged the contents of their digestive system, closed again their "mouths" or vents and evidently fell to sleep. When they had recovered from their temporary exhaustion, they would suck into them again — or maybe devour — some smaller creature. After this their strength came back to them and they would bumble off down the circulation ducts — so serving in their blind way the much vaster organism in which they lived and moved.

This discovery of the slowness, the weakness and the earth-boundness of the things that moved in the ducts of the low and sprawling stain-organism, would make the observer fairly certain that these micro-organisms could not be either very strong or intelligent. Crouched on the earth, able to proceed — and then only on all fours — only along these fine ducts, surely such creatures would have no interest save in what came straight in front of their down-bent noses. They would have luminous eyes with which to see their way at night but these eyes would be turned almost always onto the earth.

But then, having decided that this was the one species with which a visitor would have to deal, the newcomer would suddenly discover there was another species — a kind of rudimentary flying or air-skidding insect. And, what is more, there seemed some evidence that this insect did take an interest in things above it. Was it possible that it had noticed us, the cautious, far-distance-keeping visitors? Hardly possible for such a rudimentary animal! But then those who come on new facts must, above all, keep open minds. Nothing must be ruled out, in an unknown situation, however improbable, however ludicrous it must appear to a creature of common sense.

Of course then, the first wise step is to plot the paths, and so deduce the powers and maybe the purposes of the winged (or fluked) species. The crouched, crawling species had to have routes, ducts in which to creep. Did the air-skidding creatures also have to follow lines, because, one might suggest, they had to be drawn along fine lines from point to point? They were a rarer species than the crawling lice or circulation cells of the earth-level ducts. But it was soon clear that they nearly always were moving from one stain-patch to another — yes, they were on some kind of traffic schedule between these stains. Maybe they were a kind of fly that was thus cross-fertilizing the lichen stains? Perhaps they flew from one to another to collect its pollen. Certainly above the stain-organisms could generally be seen a kind of dust that might well be a discharge of fine reproductive spores on which the insects might live. In exchange they would blindly serve the purposes of the great main plant organisms by mixing the pollen of one distant plant with the pollen of another — a blend which the plant organisms on their own could never hope to achieve.

So the first thing to do, when this important discovery was made, was above all to study the routes of these air-skidding insects. As we have seen, this nearly led to some accidents — though that may be going too far. In such perfect control of such perfect craft, these riders of the upper sky may not have been taking the slightest risk. If our grandparents or great-grandparents saw us "weaving" along in our cars on the densely trafficked streets, the whole pelting stream often surging brightly along at thirty miles an hour, they would have gone home and had a quiet and final nervous breakdown. To them a modern street could only be a picture of perpetual temptation of Providence, a nightmare of men continually, wantonly, risking instant destruction. But there can be little doubt that these facts the visitors were learning. They must keep away from us. Give us a wider berth than perhaps they had thought at first

they would have to give. But that was merely negative self-advice.

Could they do anything positive? Obviously. Was it not clear that the insect species had some kind of energy, maybe tapped power, perhaps no more than a higher protein diet, that gave them the force to get up if only into the lower, thicker air — while all the rest of the living creatures either had to crawl along ducts, or lower still — if larger — just sprawl immobilized, as did the big stain-organisms.

So the next step would be to find out what these sources of power were. How could the onlookers do that? Even human advance has in the last decade suggested a way, perhaps the way. In the last few years there has been increasing use of the plane for surveying for ores, mineral deposits, oil field possibilities. Instead of stumbling across the rough terrain, trying with heavy instruments to locate radiation coming from the ground, trying with such super-balances as the Etvos machine, attempting by gravimetric methods to gauge what masses of coal, etc., may be under our feet — it has been found that instruments can be carried in planes which, riding in the air over such districts, give readings useful in indicating what is hidden in the earth below.

Let us suggest that the "brooder" that hung for two days unmolested over Alice, Texas, was such an observer. Maybe he was making soundings in the earth 5,000 feet below him and maybe another 1,000 feet into the crust. Texas is one of the richest mineral sites in the world. Already it has given us much oil. There may be ores in that great district, ores the power possibilities of which we are yet too backward to know.¹⁵ The visitor may then have been making his soundings to answer the question. "How are the earth creatures — at least the winged species, powered? What is their food or fuel?" As we have seen, our apparent resentment at such quiet investigation led the visitors to be more circumspect. But can we think they would abandon all hope of learning of our powers? Not till they knew those could they safely approach a creature of uncertain intelligence and even more uncertain temper.

And, final speculation — for till we know more—we must explore every possibility — might not this not unnatural supposition as to rationally cautious behavior account for the one disaster that has marked this "saga of the skies"? Might it not account for the Kentucky tragedy? Fort Knox, which seems to have been in the center of this episode, is, as was remarked above, the place where the greatest accumulation of gold was ever deposited by man. It has been guarded as though national safety depended on it. The late President Roosevelt had the grand old-fashioned fancy about Element 79, whose chemical symbol is AU and whose atomic weight used to be given as 197.2, but of whose unique value in chemistry or physics there is no evidence. Its worth, of course, is due to the fact that it was, and still is, fairly rare and was once, but is no longer, thought to give a dead man a better chance of living in another world than the other poor fellow, who had none of it put in his dead mouth, could hope to have. Hence the oddest dump on the whole surface of this planet.

Can we doubt that any sky-surveyors seeking to know of our powers and power resources, our ores, minerals and raw materials would not sooner or later strike the radiation, or gravitational displacement, of this huge dump? Its existence and its treasured care would awake further speculation, further puzzlement. Why do we keep that yellow junk? Do we circulate it? No. Do we eat it? No. Can it be used as a secret form of power generator? That must be it! So they would make their readings. It must be radioactive. Perhaps the creatures have found some method to get power, propulsive power, out of it. After all, one must never underrate strangers. Perhaps, after all, on one or two points one of the species is really quite advanced. But still the gold refused to give up its secret, still it remained stubbornly inexplicable — of no use, none whatsoever, completely inexplicable to any intelligent creature that did not know the tragic, bewildered, fantastic story of man's illusions and mistakes, misapprehensions and murderous muddles. How could any creature of understanding hope to grasp the story of our insane fancy about AU, Element 79? How could he think that today, when we have flying and power sources, we still tie ourselves to a superstition which we do not even any longer believe?

15. As 1950 ended we were all surprised (agreeably or disagreeably) to learn that a man who was no technician had stumbled on uranium ore in New Mexico, the very State where full-scale atomic explosion was first demonstrated more than five years before.

But that these visitors may very well be plumbing and testing our power resources, we have at least more than a couple of strands of suggestion and deduction. And this possible knowledge has come through our latest instrument of testing what we can't see — radar. For radar not only tells you of planes that haven't yet arrived, of shoals of fish in the sea and where you may catch them, of raindrops falling in the height of the sky, of meteors as they fly invisibly by day and of their long tails and trains when they have faded from view even at night. But radar also tells us of things that never turn up to our eyes — naturally we would expect that. After all, what we have just been talking of makes that not only likely but certain. If with electric instruments you can tell, by the radiation it gives off, where water is underground, where oil and coal and iron may be lying a thousand and more feet underground, then why not detect radiations that come from outside the earth? Of course thunderstorms, even when they are not booming and crashing, now give themselves away to radar, and indeed to many an ordinary radio set. But there are some radiations, radar findings, that awake speculation as to whether there couldn't be an intelligence, a probing intelligence, behind these rods and lines of force, these ultra-visible objects that send back the "echo" that radar picks up.

In this case one of the most popular articles on the problem was issued, as it happened, by *The Saturday Evening Post*, the very magazine that tried to pooh-pooh out of existence the disks themselves. On March 6, 1948 — while the saucers were very much (and were to continue to be) on men's tongues and on their minds — *The Post* published a startling story under the name (startling enough in itself), "The Sky Is Haunted." No question mark to give you a chance to doubt it. Flat statement. These "objects" which radar had been picking up, mainly over North California, the author of the article calls "Gizmos." On one occasion the radar picked up, and gave full indication of, the fact that a plane must be crossing the flying field on which it, the radar, was being operated. It gave the marks which are the signs that a plane is being echo-sounded, and that it is a plane and not a shower of rain or a storm. If there was no living intelligence directing this invisible point or beam, then the focus would move with the wind. But these "Gizmos" didn't.

So it may be that we are being probed, which is precisely what we should expect of super-flyers — probed by their detection rays. And when our radar comes up against these foci and shafts of invisible force, it gives off the signal which it utters when it strikes a solid object. For we must remember that the hardest radiation that we know, the radiation that comes from the cosmic deep of the outer sky, is so hard that we can't feel it. That radiation rushes through our bodies, disturbing — Sir James Jeans told the present writer — probably not more than a couple of hundred of the trillions of atoms that make up our bodies. It rushes through matter as light through a window and has to go hundreds of feet into the earth — perhaps the hardest goes thousands — before it is checked. So these rods and foci of force, directed force, that the radar picks up may be from the disks.

Now granted that they must want to find out our sources of power — to understand our natures and capacity — they would direct their detectors wherever they found a great dump of any element. At Fort Knox they would find the most refined and the most accumulated dump of AU (gold) that is or has ever been. This, then, must be our real source of power! And, marvelous to say, in this respect we — we may assume them to think — are ahead of them — at least from their generously cautious point of view, which allows, when someone does something that seems to be absolutely stupid, it can't be so stupid as that, and so may be ultraclever.

But none of the instruments which the smaller disks carried could find out the radioactive, the power aspect and potentiality of the great dump of gold. No doubt they tried night after night, and brought back to high-up headquarters again and again a blank. Two things were possible: perhaps the power was screened in some way; perhaps at night it was protected or immune from the probes? At least one more assault ought to be made on the problem and at daytime. At least one ought to bring all one's "guns of detection" and probes of diagnosis to bear on this, the hardest nut, the most mysterious problem that earth had as yet given them to crack.

Perhaps the most powerful detectors are too massive to be mounted safely on the hundred-foot disks or borne in the long, black hundred-foot length tubes. Perhaps the super-mother ship, perhaps what

may be the artificial satellite that rides out on our orbit, alone carries the plant that could range and probe the gold riddle. Then, of necessity, they would bring down their monster ship. It would come rushing over and, after the great swoop, go back to its high station, where maybe it rides three or four hundred miles or more, sweeping round us like a swift, minute, cryptic moon. But, alas, the story ended with a miscalculation — one that probably could not have been foreseen, but one that may have led to even more caution on their part, as it did lead to more alarm on ours.¹⁶

Here then we ought to ask another question: Are such notions as an artificial satellite quite absurd? The answer is, Certainly not. This step toward outer space and, say, a journey to the Moon (off which, it must be remembered, quite a good echo has already been caught) has, as its first planned step, that we should mount a minute model satellite of our own. The plans are already being worked out. The Nazis were working at it as their super-siege gun to fire down on their foes. Now the defense center at the great building in Washington, D. C, called the Pentagon, has definitely announced "The U.S. Earth Satellite Vehicle Program." The man-constructed "satellite" is to get out to its station by means of its rockets, which will boost it aloft. It must go over 20,000 mph to get free enough of the Earth's pull. But it will not be sent nor let go very far, so far as space is concerned. At five hundred miles out, its automatic guiding gear will switch it round at right angles. The rockets then cease to drive it, and, spinning on its course, as does the Moon on its circular path a quarter of a million miles farther out, our first contribution to the solar system, this Earth child will rush round and round us. It will get round our girth in a couple of hours. Then, when that is established, we are, so the plan goes, to plant, farther out, another stepping stone on "the printless skies." This second base might act as a "dock" for other craft, which will launch out from this floating jetty and plunge into the real depths, wherein the bright and immense Earth will shrink to a watery gleam of light in the fabulous darkness, or a mote of blackness against the blinding welter of the unscreened sun that drenches all our orbit with an unceasing blaze unrelieved by evening or night.

Such are our notions, such what we feel to be our rational, if high, ambitions — though beside them the building of Babel seems a modest proposition, and "the overweening pride" which Aeschylus diagnosed as the cause of the great Persian King's disaster (because he tried to chain the Hellespont) — such pride seems a very little thing.

But, if we consider that our own ground (and still mainly grounded) forces are thinking of scaling the sky and taking their stand outside even the atmosphere, we cannot be surprised, we should not be so shocked, if we should find that we have been forestalled, and that someone else has already taken up their post on this desirable location with its unrivaled view of landscape and seascape.

So now we may say that we have some notion, if only the sketchiest, of the sky-cruisers' crews' viewing stations, viewing powers and views. Of course they must have soon learnt that our automobiles didn't really move themselves, weren't really automatic. They weren't carapaced insects. But we, the true motivators and living units, were these cars' still smaller, slower and frailer inmates. So, too, with our planes. But our powers? These still remained baffling. What could be our real forces? They would soon have detected our dependence on steam and oil. But mustn't they by now have suspected something much more disquieting? However disproportionate it must seem to our puny controls, our feeble bodies, mustn't

16. This argument gains additional force from radarman D. W. Chase's account of his Oregon sighting. For he asks readers to study the path of flight of disks which have been sighted in Oregon and the neighboring States. He maintains that they may all be charted as either going toward or coming away from lire large Hanford, Washington, Atomic Pile. And (as all collectors of news items in regard to lite disks know) a number of people at Hanford itself asserted to newspapermen that they had sighted a hovering object over their town in October, 1950. (See further, Page 110.) The same article in *Fate* (for January, 1951) that carried a reproduction of Mr. Chase's article added confirmatory evidence of the radar-recorded "Gizmos," but called, more charmingly, "Radar Angels." Whatever their right name, these radar-recorded bodies seem to be purposive and up to some exploratory research of our environment and maybe of ourselves.

it be suspected by a looker-on — mustn't his radar probes continually propose — that places such as Oak Ridge and Hanford in the States or Harwell in Britain have an alarming reaction note, a forbidding radiation? We have seen that one good and fortunate observer (Chase) has no doubt of this. The direction in which such suspicions would, and indeed must, point, we shall be having to consider when, with our further accumulation of deductive knowledge of both craft and crews, we reopen the question "Whence?"

Before that, though, we must ask another preliminary craft-crew question. Granted that the smaller disks come down from a giant disk riding now as our second (and very midget) moon right "under our lee" — could a whole swarm of visitors have such a base? What was viewed once and perhaps twice was a monstrous enough thing — perhaps a thousand feet across. Nevertheless, is that large enough to act as the floating jetty for crews to man, say, a thousand and more craft, many a hundred feet across? To ask a human crew of a whole flotilla to lie up and rest out in one mother ship of such a size would create the cruelest congestion. But congestion bears an exact inverse relation to size. The first gets less as the second gets more.

It is here then that we must raise again an important piece of craft evidence as throwing light on crew build. On this point we had a startling, and at the time it seemed anomalous, piece of expert witnessing, which now has a strange appositeness. We recall that at the White Sands observations Commander McLaughlin remarked, as a trained observer would and could, that there were two acute problems raised by the flight of the saucers as the observing teams checked it. The first was the tremendous speed — 18,000 mph which is of course, the speed you must go to become an artificial satellite and avoid faffing back on the earth — and on top of that, and even more serious, the tremendous acceleration. In short, nothing larger than an insect, say a bee, could stand that sheer push and not, literally, be pushed out of life, pushed out of its body. And yet — and this is the second point — the Commander felt that, considering the way the disks were handled and turned, it seemed unavoidable that they were under direct control of inmates, they were "manned." So we must assume that the masters of these machines are minute. What that may mean "by and large" we can wait a moment to see, while we fit this answer, as far as we have it, to the question which raised it: Could a disk, only a thousand feet across, act as the rest home and holiday ground for crews that "man" whole fleets of disks? To an insect, of course, a residence a thousand feet across would be not merely a city; it would be a whole county, a whole province, a state in itself.

CHAPTER TWELVE

Whence? Again

VERY well then. Now we must go back to "Whence?" armed with a little more knowledge. And, anyhow, we cannot any longer decline or oppose the thrust of the question, Where if not here? The force of the argument drives us out, if we cannot find purchase for the disks on earth. We have searched the whole of the land and suspected even the sea. (Some people have suggested that the disks rise from the ocean and take to the sky, disliking only earth. But this attempt to do without the hyphen of the solid between liquid and gas, seems a hopeless effort to avoid the difficulty of finding the disks some base.) None of the earth or ocean sites will hold water. We are forced up into the air; and the facing up to the artificial satellite is of course only a steppingstone (as the thing itself must be) to get our minds (as the crews aloft get their bodies) to some extraterrene goal. If it wasn't sent up, then it must have come down. It must be like that manipulatory midget world that Jonathan Swift imagined as the Kingdom of Laputa, in his *Gulliver's Travels*, which could be raised and lowered by its inhabitants.

Anyhow, as we are being forced out to ever great distances and "heights" by the force of argument and evidence, let us, too, do some viewing and scanning. And, if we must leave home, let us start on the sunny side of space. But the first and sunniest spot certainly won't do. Life may exist under the strangest of conditions. Sir Spencer Jones, the Astronomer Royal, has said that bodies might be constructed not from carbon, as ours are mainly, but with silica as a base and so resist heats which would

be deadly to us. But Mercury, the innermost planet, has on its sunny side a temperature that would melt lead. If you could stand that, then why have a body at all? There may be creatures in the Sun but they must be fields-of-force, electric vortices, subtle bodies, what you will — but not beings that need to man space-ships. We leave Mercury then, after one almost blinding glance, and take refuge on Venus.

With Venus serious enquiry begins, and, indeed — what is such a help to serious enquiry — a proper sequence, one that everyone knows. The sequence runs Venus, Earth, Mars. Most people believe it's a chronological sequence: Venus young, ourselves middle-aged, Mars old. But Venus is too young. It is amazing what is now known about our neighbors, especially these two, one on our inner and the other on our outer side.

The first thing, of course, is to try and find out what may be the nature of what you first see. If there are clouds, you will first see them. And if they are dense, that is all you will see. And they are dense, unrelievedly dense, on Venus. They have once or twice been seen to eddy but never to break. Their bright, blank blanket turns back all our peering. But we can turn our spectroscopes on that bright screen. And that does tell us something, something that seems pretty final. That blanket is not the cloud, the white cloud, that we know of our own sky. It is made of carbon dioxide. It is not to be unexpected. If Venus is much "younger" than we — or perhaps we should say, because nearer the sun, later to cool, slower to clear — then of course she should have that kind of clotted atmosphere made of that kind of gas. For carbon dioxide is a gas, or air, very favorable for plants, but not for animals, least of all for a "brainless" animal that needs oxygen.

As the carbon dioxide became less in our atmosphere, it would seem the great masses and messes of vegetable growth that were laid down as the coal measures, withered away for good. And in their stead came more and more animals, more and more active, more and more interested in staying on the land, and finally more and more interested in looking at what was now appearing clearly: the sky and the stars. For that fact, or the negative side of it, would alone tell against a "Venusian" being a space explorer. For you don't explore what you have never thought about, never thought existed. Even if a fishlike creature swimming in a hot swamp, even if an intelligent Venus flytrap (a plant which can catch insects) thought of leaving home, where would its thoughts go? Above is nothing but a cloud so thick that it's underside (like the hearts of our great dazzling-topped cumuli are found to be) may be almost dead dark; and, anyhow, all around must be steam and fog that may reduce visibility to a few yards. If you never can see more than a foot or two, your eyes are apt to have the most modest range, granted that you have eyes at all. So we must leave Venus, as we left Mercury. The one would give us too much light, the other too little.¹⁷

And so finally we find ourselves confronted with Mars. Of course there is something a little vulgar, we now feel, about the notion. We all would like to avoid it. For a couple of generations we have been having Messages from Mars — from popular plays that were so heavy with Moral that Mars, it was clear, was only a mixture of a catapult and a pulpit, a place from which it was hoped to launch, with the impetus and surprise of novelty, a message so old that, as John Morley called such advices, it could only be classified among the Eternal Commonplaces. Alas, Commonplaces are not made any less common by being given uncommon places as pretense entrances. And after the popular plays, or indeed alongside of

17. A number of astronomers (or perhaps one should say planetologists, for those whose opinion in this matter is needed have to be specialists studying not stars but planets) have denied any life on Venus, even the most modest. The rotation is now given as twenty-one days — a very long day-and-night sequence. But, far worse for life, the spectroscopes had seemed to show that the carbon dioxide cover-cloud had in it no water vapor. "No water, no life" has always seemed a very strong closing argument. But now some research would seem to show that water may be present. The geophysical discussion held under the auspices of the Royal Astronomical Society at Dublin in October, 1950 raised this issue. Dr. Menzel showed that the negative spectroscopic evidence was due to the fact that the water, or HgO, would be present, due to the convective currents in such an atmosphere, in the form of hail. Lyot's observations using the polarization of the light that comes off from the Venus cloud bank does tend to indicate that the cloud bank is composed of water. Further work has been begun on the subject at Lick Observatory.

them, came the first science fictions. H. G. Wells brought in Mars with a cash. But of course being a very bellicose little man he had to make it a War of the Worlds, and the Martians themselves squids of the most squiggling horror, whose one use for humans was as blood bottles to be sucked dry. It was a blood-and-bones, and heat-ray and pandemic business from first to last. We had nothing to hope from them; they nothing to do with us but to drain us dry and inherit the earth.

Naturally the astronomers, who are generally benign men, whose blood, not being frozen by the thought of the cold of outer space, is not likely to chill, or to wish to, at the fancies of amateurs — naturally they did not like that sort of thing. They had, too, gotten used to wandering about in the utterly empty and vacant universe — some with God and some without. What they did not wish, and saw no need to invite, was any other creature to share their solitude. Probably a psychologist would tell us that men become astronomers because they have at heart no love for life, but enjoy being a disembodied eye which refers all its findings to a purely mathematical ego. If you are used to having all the garden to yourself, even if it is very large and very bare, you resent the thought of intruders and indeed of anyone that you did not introduce. Certainly the vast number of astronomers were inclined to say, "Certainly not" to any common person who said, "Couldn't there be life on Mars?" And when Lowell, the Harvard astronomer, having gone to Flagstaff in Arizona for the very clear air, said he had seen canals and was sure they were periodically flooded by intelligent creatures to irrigate their crops, then all but one or two of the profession said, "We have never seen any of these lines that you say are there." It was then perhaps a visit of courtesy (for we have already maintained they are courteous folk) that the other day, as we have already seen, took a disk to Flagstaff, there to show itself to Dr. Hess, who now keeps the watch that Dr. Lowell opened with such romantic energy and exciting speculation.

Before, then, we dare open again this somewhat inflamed question and see how the controversy (sometimes called the Battle of Mars) has gone, we had better, for peace's sake, look at all the other "rest-spots" or "bases" in our system. Out beyond Mars, of course, is a belt of asteroids, called the Asteroids. They are no use to us as they are — Ceres, the largest measured so far, is a mere raft of a thing, 480 miles in diameter. More than a thousand have been spotted. Some competent calculators think there may be fifty times that number. What they were once, what astronomers have mainly agreed they come from, we shall be coming to in a moment. It has a possible bearing, quite a strong one, on our tale.

On again: In our search we come to Jupiter and Saturn, the two giants. We know what their atmosphere is. It is probably frozen; it is with high certainty methane gas, an utterly suffocating fume to any animal life with which we associate intelligence. Under that more than Arctic sea of frozen methane it is hard to think of anything that we know as life keeping on or breaking out. Uranus, Neptune, Pluto and perhaps a hither-Pluto, a final Proserpine — what of these? Further cold, further darkness, further uncertainty of anything that would guide us to a home of life. Sir James Jeans told the present writer that if there were a person on Pluto and he were looking for sunrise, he would have to search carefully the sky — granting that the sky was visible at all on that planet — to be sure the Sun had risen. Among the stars and the larger nearer planets the Sun might only look like a star among other stars.

So having wandered to the rim of the solar system, why should we go farther? After having been told for years that the Sun alone with any probability had planets, now we are told that plenty of stars probably have them. Many million stars possibly mother such broods. Very well, but why start searching out there for planets — deduced and never seen — on which there might possibly be life and from which therefore visitors might come (although they have their own system to explore first) when we still have one awkward applicant waiting to be examined? So back, however unwillingly, to Mars.

And, as it happens, as soon as we do get back — that is, to the latest current findings made by experts looking at Mars — we do find a change of "climate," a warmer feeling toward the red planet, a hint and more than a hint that the gap between the Loweffians, the canal-speculators, and their severe critics may, if not be closing, at least no longer have such yawning and abrupt edges. We left Mars with the vast majority of astronomers, and especially the greater part of the Mars experts, saying. "The place is quite impossible, please do not trouble us with offers to show that it could be a good building site for Life." The "Negatives" held the floor of the astronomic debating house. They took their stand first on

general principles.

What is Mars if we are to trust our senses? Well, when we have used the best helps to our eyes which, twenty years ago, telescopes could give, we saw an object about the size of a small gooseberry and of the tint that the reddish variety of that fruit often shows, tawny with slight stains of a greenish hue. But any photograph did show something that no gooseberry, even when mildewed, wears. The two poles had white caps. Of course, at once the hopefuls said, "That's snow' — just as our planet would show, if we were looking from Mars at Earth."

The conservatives counterattacked: "No, it's frozen carbon dioxide, and so if you were on Mars you would be in no condition, and would never have reached any condition, in which you could think of being curious from your station on Planet Four about the nature and possibilities, the life and possible intelligence, on Planet Three!"

"Then what about the greenish patches? Surely these are vegetation and vegetation might mean animal life?"

"No, again," said the deniers, "you mustn't make assumptions and interpolate your own incurable anthropomorphism! The green could be merely chemical changes. After all, corrosion often gives green patina to red-looking metals and their dust — think of copper and verdigris! There is no water above ground — no flash of lagoon or lake. The dirty green patches are the graves of oceans and the grave of the ocean is the tomb of life — for life came out of the sea and when the sea goes, life vanishes too!"

"But there are clouds!"

"Most — the large, dark ones — are just dreadful dust devils — rust particles whirling about in devastating tornadoes."

"But there are white ones."

"They are made simply of a superfine snow."

But here we must pause and ask, How can all this be known when you are watching a thing that at best looks like a poor sort of cherry? Have we got finely enlarged photographs? We have not, and won't for a year or two more. Why not? Because of those subtle twister-devils of our own atmosphere — the "convection currents," the wavering of warm or hot air as it rises, a wavering which distorts any image seen through it. The image of Mars is never steady enough long enough for our present plates to take a perfectly clear photograph. We do depend — and that has made the canal controversy so difficult and even bitter, because we *have* to depend — on drawings made by astronomers, as moment by moment, for an instant, the image clears and we see with a clarity what the photographic plate is too slow to record.

Well then, is not everything speculation, and critics and believers all in the same boat of drifting ignorance? No. For even before the huge hundred-inch telescope was brought to bear on our Mars mystery (and even it has not been able to give us a clear photo — for that, we are waiting on the two-hundred-inch mirror when Mars next comes close) even before our telescope power was what it now is, the spectroscope and the thermocouple had got to work on the problem. The spectroscope of course is a magic resolver of chemical questions. Hence the dispute whether Mars has or has not oxygen and carbon dioxide can be settled more or less by this means. The thermocouple can tell what the temperature is on the surface of the planet.

Of course, these tests, as they have gone on, have told not wholly in favor of the Negatives, the life-deniers. First and foremost, the spectroscope showed that the caps were not frozen carbon dioxide but true frozen water — the very way they melt in "spring" shows that this is water, not dry ice, melting — or one should simply say water melting, for dry ice doesn't "melt," it vaporizes straight away from solid to gas. But the Negatives counterattacked: "The caps are simple hoarfrost — their spectrum shows that. Try and irrigate with the flow from hoarfrost!"

"But the green patches *do* get green and lose their sere appearance when the spring comes on and the polar cap melts!"

"Ah, but we have two nice backhanders for your hopes on this very point. The thermocouple gives you one and the spectroscope gives you the other. The thermocouple shows that the heat is actually

greater above the green patches than on the red desert. Now everyone knows that air over a forest is *always* cooler than air over even ordinary open land, let alone a red desert! The buffet from the spectroscope is even more flooring: The spectroscope shows that the so-called vegetation belts or patches don't give the same spectral reaction that chlorophyll, the very substance and life blood of all our vegetation, should give!"

Still there is a counter-counterattack to this severe check. At least the thermocouple's verdict of death can be reversed. For a Soviet astronomer (perhaps they have a loyalty to a red planet) showed from work on the farthest north spruces and other conifers that these trees which have to face subzero temperatures have already reacted to that danger by an amazing device. Their fine narrow "leaf" actually can hold heat, and in order to survive they, in point of fact, do create for themselves a blanket of warmth to keep out the intolerable cold. All we see on Mars is not an anomaly that opposes the hope of life, but as a matter of fact one of life's new victories, the beginning of which we are witnessing on our own frontier of utter cold.

Life on Mars is certainly far ahead of us. And we may ask — for the question is crucial and really decisive — if life down here started under the most favorable and protected conditions — in shallow sea-pools, near the shore, sheltered by warm mists — and then has gone on, under a clearing and "colding" sky? What does that suggest? And further, if, while conditions have become, more strenuous, it has climbed from the shore — yes, and as Beebe has shown, life has dived into the black of the deep, and, as the Swedish Deep-Ocean Expedition has shown, has gone right through the so-called Azoic Abyss, and in the form of those animals called *Daphnia* — the really quite nice sea slug — is now parading the seven-miles-down floor of the ultimate ocean — if life has gone down and up, why, it is carrying the offensive against death, carrying the war right into the enemies' country!

Life isn't losing, it's winning. That fact of the thermocouple's finding, interpreted in the light of what we now know about the offensive fight carried on by our own trees against the Arctic subzero cold, that fact may help us, too, to answer the spectroscope when it says these so-called growths on Mars are not vegetation. For is chlorophyll the only "life blood" that a vegetable can use? Take our own blood — we use iron, which gives our gore its tint. The crustaceans also have a blood of a sort. But though it is red, they have made their crimson life fluid out of a copper base.¹⁸ It has also been suggested that there have been forms of life that used manganese as a base for their life fluid. There seems to have been a time in our own geological past when there were trees which had manganese in their constitution. And finally we have found that even on our own world there are forms of vegetation that don't use chlorophyll. We used to think that life had only one way of getting up to consciousness, one very narrow accidental crack or canyon in the blank face of things through which somehow by blind luck life leaked, only to fail and perish at the top. But that picture does not seem at all inevitable. "Convergence" (the idea that life has made quite a number of shots and searchings to get through and up) is a notion inconvenient for those students who want a very simple plan to impose on things and to help order their actual findings. But Convergence, there can be no doubt, is becoming an idea harder and harder to keep out of the textbooks.

So there is no reason that there should not be life on Mars — the planet is farther out than we — generally, fifty million miles farther out. There is no doubt it is ahead of us and therefore can manage better with its more strenuously rationed resources than we could. It is also smaller than we and so would have gone through the first stages of its history more quickly.

But it is of the same substance as Earth, and that substance has nourished life. "But only vegetation, remember!" comes the warning voice. But has vegetation ever been found without mobile life? Didn't they both spring from the same root — is not a yeast right at the division of the ways — can there be vegetation and not animal life? Aren't they partners, aren't they (to use the technical term) symbionts — that is to say, co-operative companions tied in a perfect balance with one another?

And that is the conclusion of most Mars observers today. For there can be no doubt that gradually in the last twenty years the altitude that assumed life on Mars was the natural reaction of human

18. Vanadium, a rare element, is nevertheless used by vast numbers of a small sea creature to make its vital fluid, its "blood."

sentimentality, is not anything like as strong as it was. And indeed we may say that recently — in the last three or four years — the "Lifers" have won most informed opinion from the "Non-lifers." "Yes," it is allowed, "there is vegetation."

Another Soviet astronomer has come in on this less materialist side. He has added that the amount of carbon dioxide that is found on Mars — or in its spectrum — is not so high as would be found if there were no vegetation, but balances nicely with the balance that vegetable life would manage — for of course it is the vegetation's power of dealing with carbon dioxide and the animals' power of dealing with oxygen that make one of their strongest symbiotic ties and mutual services.¹⁹ But what sort of animal — putting aside the question whether there could be a vegetable that was as intelligent as an animal — what sort of animal could exist on that desert? Dr. Gerard P. Kuiper of Chicago, who is one of the great authorities on the atmospheres of our fellow planets, said in the middle of March, 1950, "No form of life as we know it could exist" — on Mars — "but insect life."

Now it is at this point that we reach a real crisis in this story. If there is vegetation, there is pretty certainly insect life. Plants and insects are nearly the first example that even the most cursory study of Symbiosis and Ecology (the interbalance of a whole area's way of living) brings to light. Further, we know how far insects have gone with us. Three quite different branches of the vast tree of insect life have stretched up, each on its own, and achieved ways of social management, elaborate economies, masterly co-operation, triumphs of co-ordinated specialization that we thought, when we started to think of such things, were confined strictly to ourselves, to the great-brained creature called man. The ant, the termite (which of course, though a dirty white, is not an ant at all but may be sprung from some sort of aspiring cockroach) and thirdly, and most familiar to us (because of its long superior power of making what we need: sugar), the bee, the honeybee.

The ants have slaves and "cows," and till a fungus crop and forage and store. Yes, they even make war — the only creature save ourselves to do so: they campaign and capture and enslave their captives. The termites are even more acute — actually running ahead of our wildest "Eugenists" and breeding soldiers, mighty warriors to defend their castles, special trap-mouthed termites who can cut an invader in half with their huge jaws.

Indeed in the studies that in the last fifty years have been made with the ants and the termites, it seemed that the poor bee was being left behind. We had thought that it was the perfect model of efficient, self-effacing industry to hold up before boy and girl. Of course there was the ant, but the bee was better. But now the ant and the termite seem even more industrious, more self-effacing — though the by-product of the one is not honey but only ant's eggs (useful only for those who keep goldfish and some other fanciers), and the by-product of the other is (if you live where they work) your whole house literally eaten out over your head and from under your feet, for wood not flowers is their diet.

In any case, the insects have given us many surprises — they are intelligence incarnate, in a way most surprising and even to the point of being a little disquieting. What if they should wish to take over? Be assured, the entomologists have replied, they can't. They took the wrong turn long, long ago. They didn't evolve lungs. They breathe through holes all over their bodies. This is a very crude way of respiring. It has therefore one great limitation (luckily for us) — it limits size.

The insect can never get large. One of the largest is the tarantula spider, with a body perhaps as much as a couple of inches in length, or a little more. Not only does the size of bee, ant, and termite make them helpless against us (their physique handicaps them hopelessly), but so do their minds. Ingenious they seem and maybe are; but inventive, no; responsive to new conditions, never again. Why? Because they settled down millions of years ago. Before we had even thought of thinking, they had done,

19. Professor B. A. Vorontsov-Velyaminov has declared that the atmosphere on Mars contains approximately the same percentage of carbon dioxide as that on the Earth, while Dr. Tikhov pointed out that there must be plant life on Mars because without plant life the carbon dioxide content would be much higher. We know that it is because plant life can absorb carbon dioxide and give out oxygen that it is possible for us to get the oxygen we need and not be asphyxiated by the CO₂ we breathe out.

for good and ail, all of theirs. Their little, hard, encased bodies are not so hard and stiff and shut up as their little, instinct-bound and -riveted minds. We can find preserved in amber millions of years old — maybe scores of millions and more old — perfect examples of ants which are just like the ants of today.

Of course that argument has a little twist in it that we should note in passing. For, though their bodies may not have changed for geological ages, we can't prove by that, that their minds haven't. If we take the skull of that paleolithic man, Cro-Magnon man, we find that it is as lofty, wide and high, and as roomy inside, as ours. But did that person have our civilization, did he have our ideas or powers? He had not even the simplest agriculture — he seems to have been a very simple hunter — we do not know that he had even a hut to live in. His mind, as shown by some contemporary art and tools, seems to have been a rather simple mind, still at the level of "eidetic imagery" (that is, the images in your mind appearing to be objective pictures, seen, say, against a blank wall). So, as our own minds have grown enormously in the last score thousands of years (though our brains may still take up no more room), so too the bees' minds may have grown though their brains are not larger than their ancestors'. This is all the more likely when we remind ourselves further that the more efficient a brain is, the less, not the more, room it may take up. Early machines are always more clumsy, more diffuse than later and better ones. So with the human brain. We have discovered that it is the depth of the convolutions rather than mere size that may give us some better correlation of brain to mind. Some idiots have very large brains. Anatole France, one of the most brilliant of French authors, had a brain that was so small as to be close to that level usually associated with microcephalic idiots. But the convolutions, the deep foldings, were very deep.

Finally, when we consider that we know far less about a bee's brain than we do about our own — and our knowledge of our own brain has proved quite baffling in a number of cases — we must conclude that we can do little to study, still less to understand, a bee's mind by looking at its brain. What we must do is what we do with ourselves when we want to gauge intelligence. We watch how the mind that is using the body works — what can it do, design, create?

We know by that test that bees have come a long way. It is pretty certain that they started far simpler in their way of life than they are now — just as we started without gear and goods and plants and tools and cities and transport. It is generally conceded that the bees, who now have cities and a hierarchical society, came up from solitary forms, many of which still survive. From that state they have built up cities and the organization of cities, control of population, supply, distribution of power, and order of succession in a manner so masterly that beside it our own efforts along these same lines still look very amateurish and dangerously incompetent,

But, says the critic with assured finality, all this is in vain. For bees are hopelessly instinct-ridden. They really don't know how they do it and indeed they, the individual bees, can do nothing about it and probably know nothing about it, about the whole process and economy, the plan and the polity. To the question, "Then who does?" the usual believer in "Instinct" gives a polite shrug of the shoulders. It is just vulgar anthropomorphism to ask what Instinct is. The word is final and closes the discussion. And as to the basic idiocy of the insects, even the most skilled of them, we are asked to look at the widely publicized *Sphex* wasp, whose absurdities so amused Fabre and many another naturalist. For this solitary wasp hovers uneasily on the edge of apparent intelligence, only and always to tumble off helplessly on the side of complete senselessness. We all know how it makes — true mason wasp that it is — a mud-cement nest for the egg which it hasn't yet laid. How, the cell all ready, it lays the egg in the receptacle. Then off it goes to fetch a caterpillar to act as food for the grub which will come out of the egg, in due time, a due time that the mother will never see. That being so, the caterpillar must oblige by doing two things: (i) it must stay Mill and wait to be eaten by the egg that has yet to become an eater: but (ii) it must not stay too still, that is, lie in state, dead — or by the time the eater batches, the meal of the caterpillar will have decomposed. The caterpillar is kept fresh and lively for its enemy by being stung in the hinder of its nerve ganglia, so without refrigeration but with the aid of paralysis it will be preserved. This seems a perfect, if grim, procedure, showing a wonderful sense of provision. But — and this has been proved again and again- — while the mother is off caterpillar-hunting you can remove the egg from the cell. Then if you watch, sure enough, the *Sphex* comes back with caterpillar, and, never seeming to notice that the egg —

the *raison d'être* of the whole procedure — *l'ias* gone, it proceeds to wall up the caterpillar in the empty receptacle and then goes off content. It has good eyes, wonderful eyes. Yet so blinded is it by instinct, by absorption in only that part of the procedure it is intent upon, so ignorant is it of the whole process and purpose, that it just can't see that it has been utterly frustrated.

It certainly is as pretty a demonstration of something having gone wrong with instinct, with race memory, as you could wish. But before we lift the example and apply it to the bees, let us remember that here, with the *Sphex*, we are dealing with a solitary creature, a creature that went on with its racial pattern by itself and never attained to the elaboration of the social life of the bees, ants and termites. They have evolved far, far away from the solitary state.

Back, however, comes the critic: "Look at bees then," he warns, "you will find really very little difference." And so most entomologists would have said until quite lately. Indeed so certain had they become that all insects were Incapable of anything that we would call consciousness, that J. Loeb, who was, forty years ago, one of the great entomologists, felt that it was unwise to speak even of instinct. Race memory, if that was what instinct was being taken to mean, was altogether too romantic an aim. He popularized, for describing insect behavior, the word "Tropism." The insect turns toward its food — the pollen for the bee, the carrion for the carrion fly — because it is drawn compulsorily, unconsciously, just as iron filings are drawn to a magnet.

That was the standard faith. And then, after the First World War, an Austrian entomologist of high standing began to publish papers on bee behavior, in which he was a specialist. The results have proved so revolutionary that it will be simplest and briefest to give here a short popular account, written from the actual reports of Karl von Frisch's work.²⁰ In the following pages is summarized what is known, up to date, about bees' intelligence. For if this is not intelligence, then it is hard to know what sense to apply to that word.

Today we have to face one further revolution on the Science Front. We had begun to think that all the great revolutions in thinking, all the radical changes in research opinion were in Physics. The proof that Matter is really Force (and vice versa) and that Alchemy (the Transmutation of the Elements) does take place, these facts upset and transformed the old "Classical Physics." And Physics was and is the basic science, "the tortoise" on which the others are carried. But Biology and Psychology, the other two great divisions of Science, are much closer to us than Physics, and so seem to matter more. And they have so far refused to recognize that the revolution in Physics has made any real difference to them. Psychology, as we know, has tried to find every excuse for not looking at Extrasensory Perception. While Biology has mainly clung to a simple, old-fashioned, "fundamentalist" materialism.

Hence the violence of the shock when a great biologist, an entomologist, an apiologist (a specialist in bee behavior) produces irrefragible evidence, confirmed by other observers, that bees do think and can and do constantly exchange thoughts, consciously and constantly make plans and compare information. This revolutionary fact must now be faced, a fact quite as revolutionary in Biology as Alchemy was in Physics — and with more meaning for us. Bees actually speak. They continually converse with each other. As clearly as lip-readers carry on conversation, so can and do the honeybees. As plainly and definitely as we draw sketches and plans to direct each other (so as to find a street or house), so do these insects.

How? There are few bee observers greater than Dr. Karl von Frisch, the great Austrian apiologist. This astounding discovery is his. This, the most startling find ever made about insects, has only come to light of late. His first two papers were published in German in 1946, when he was working in the Austrian countryside, near Gratz. His next two in 1948 and 1949. It may seem amazing that bees, which have been kept by man for millenia, should have been able to pass as dumb for so long. But when we look into the mystery we see why their secret was till now overlooked.

The bees' sign language is elaborate. It so long escaped detection because it is so advanced and complex. If you showed cursive Chinese or rapid shorthand to anyone only used to reading "block

²⁰ Since the above was written. Dr. von Frisch's work has been published by Cornell University under the title: *Bees: Their Vision, Chemical Senses and Language*.

capitals" and unaware, not only of any other script, but of any other creature that could write, such a person might easily refuse to believe that the tangled strokes and dashes were anything but aimless scrawling. So, though plenty of people, generation by generation, had seen bees signaling to one another, they couldn't see that such capers were signals. The bees have so much to say, they can convey such extensive and exact information, that just for that reason if you don't from the start get the hang of it you are completely at a loss.

Fortunately, the one subject they discuss is a simple one; the hang of all their conversation is honey. That is the master clue. Had they ever talked about anything else, had they, like ourselves, masses of irrelevant interests and amusements to distract them and elaborate their messages, then we still might not have realized that bees do talk. For it is a shock. One ranking entomologist remarked when shown the Von Frisch research papers, "I am almost passionately unwilling to accept this evidence." Naturally. For bees have been catalogued as "creatures of instinct." That means that they can't think for themselves. But if you are continually giving exact instructions about places and distances to your fellows, you are thinking — and so are they.

The actual signs and signals, which the discoverer of the bee language has noticed, catalogued and interpreted, many beekeepers had noticed before. Anyone who keeps a hive can. But they seemed quite insignificant. Every now and then when a foraging bee comes into the hive, instead of unloading at once its nectar or pollen, it fusses about, fidgets, quivers and circles aimlessly. "Excess of motivational urge," said the old observers. A sort of short-circuiting of energy due to overstress. But Von Frisch noticed that the bees which were around didn't seem either impatient or indifferent to this display. On the contrary, they seemed attentively interested and what was more, they apparently learned something and acted on it. For Von Frisch had put his hives in a country where there were no other beekeepers. Unless he had done this he never could have begun to unravel this most unlikely riddle, a mystery so disguised that he never even suspected it existed. But that was only the first necessary step. The second which was as necessary was to mark each separate bee with a small spot of distinctive paint.

Then as soon as he began to suspect that the bees were actually communicating, he guessed that the only subject that they would talk about would be honey, or the raw material for it. So he placed, at various distances from the hive, caches of sugar. He found quickly that it was always a bee that had found such a dump that, on her return to her hive, straightway cut these queer capers. Further, those bees that saw her and watched her, after a few moments rushed out of the hive. And they were discovered to go straight for the hidden treasure. Of course this could still be explained away as the pioneer's elation exciting the others, who, seeing that she was loaded with loot, rushed out, and by luck lit on the deposit she first had located. But year-by-year experiment convinced Von Frisch that he must abandon all these simpler, less startling explanations. He placed his sugar caches miles from the hives and yet the bees went straight for them. There could be no doubt they must have been given exact information. He therefore noted with increasing care every movement of the capering bee on its return from finding a cache.

First, it milled round — it described a circle. But that was followed by a more confusing behavior. At last he got the hang of it. Across the circle that she had described, she was now pacing out a bisecting line. It wasn't at all easy to recognize this. For when the bee so performed, she appeared to be so excited that the performance seemed more a tipsy dance than a steady piece of measuring. Her whole body waggled and squirmed. No wonder any former observers of this trick had dismissed the whole thing as aimless excitement.

Von Frisch's great discovery lay in recognizing that in all this pirouetting there was the most precise pointing. In brief, he has proved, and convinced other entomologists, that the bee, when drawing this diagonal across the circle, is giving the onlooking bees the direction in which lies the cache. If the food-place lies in a straight line between the hive and the sun, then the bee paces straight up the comb. If the sugar mine lies straight away from the sun when the sun is straight behind the hive, then she paces straight down the comb. If the cache is to right or left of the line made by the sun and the hive, she indicates on which side and at what angle, by the slant at which she cuts across the circle she has described.

But how does she know where the sun is when it is overcast, or when from the hive she can only see a narrow glimpse of the sky? That led to a further discovery. The bee, it appears, can see polarized light. The atmosphere polarizes the sunlight a little. Some people have eyes that permit them to see this "effect." The bee sees these "streakings" across the sky and from them — as we should do from the beams of a searchlight — she estimates where the sun actually is.

But why, if she is being so intelligent, so precisely informative in giving the line and pointer to reach the food-place, must she confuse the whole thing by such waggling and squirming that till now no one suspected that she was conveying exact bearings? Certainly not to keep us in the dark. Then surely, concluded Von Frisch, if the bee is so unwaveringly efficient a worker, such a persistently rational creature, she would not be wasting time and energy and risk confusing her informees unless there were method in her mimic.

And here, sure enough, Von Frisch came upon his super-find. For, whereas her circling and diagonaling gave the direction line to her onlookers, the way she wobbled and squirmed as she went up and down that line, gave the distance away at which the store would be found. Von Frisch counted carefully with a stop watch the number of these waggles of the abdomen and he found that from them he could make a scale which indicated the space between the hive and the cache! The bee is a perfect "timer" and her onlooking fellow bees can and do count! For it is precisely the number of complete "waggle-dances," that she taps off in a definite period of time, that tells the actual distance away the store lies from the hive. The bee is so ingenious, so consciously intelligent, and aware of the way that her information must be given to her attending fellow bees, that she actually gives her estimate, not (as we used to imagine she always flew) "in a beeline," but making allowances for the actual distance flown when you have to "go out of your way" — for instance, in order to round a hill which is would be needlessly exhausting to fly over!

It is, then, that bee (and only that bee) who has found a really outstanding deposit, that on arriving on the comb (or sometimes even on the alighting board) does call the others' attention by describing the circle and pacing out the round. Then by diagonaling the circle she tells them in what direction the deposit lies. And thirdly, by the rhythms of her body movements, as she goes along the indicator line, she conveys to her audience how far they will have to fly. They clinch the proof by starting out straightway. They follow precisely her instructions and find the treasure-trove.

That this is real thinking and exchange of information cannot any longer be doubted. When we consider: (i) the recalling by the bee of the distance that she has traveled: (ii) the calculations of direction she must make, by establishing the triple position of hive, sun and cache; (iii) the transposition of the map in her mind (the actual picture of the countryside), which is of course horizontal, to the vertical plane of the hive-comb — then we can no longer refuse to believe that bees talk, bees draw maps and bees can read what a map-drawer sketches. It is a complete revolution of all our former notions of what an insect's consciousness could possibly be.

Finally, there must then remain one most disturbing but also exciting question. If bees can talk and do exchange detailed information about their business, would it not be possible to discover whether they ever talk about other things? For example, do they plan defenses when they are being attacked by their many enemies? The badger sometimes launches an attack on them; ants are their enemies; some birds, such as the woodpecker, are not out for their honey (which every creature loves) but like to eat them. The skunk will sit under a hive and if the alighting board is low, go on licking up the entering bees, wrapping them in his sticky saliva so they can't sting his throat or mouth, until he will deplete a whole hive. To all these enemies they try and make counterattacks, and when the hive itself is assaulted they show the power of coordinated strategy and tactics that one would expect of intelligence.

Of course, it would be very hard to detect this war-counciling — for then the hive is under the strictest martial law and an eavesdropper could only be regarded as a spy, to be shot at sight. We would have then to seek for an opening for negotiation when things are quiet. Surely they may have noticed that we are sometimes highly convenient — that we can be of honey-use. It may be because they recognize this in some people that toward them they are friendly, as we know they are to some beekeepers.

If once they could get over the immense initial obstacle that makes them assume that we are hopelessly stupid or incapable of serious, sustained attention (and are really as brainless, rapacious, disordered and repulsive as badgers), why shouldn't we exchange signals? It would be a greater discovery than breaking the atom, to break through into a bee's mind and learn from her what the world looks like from the bee's point of view. And, what is more, it might prove more, far more than an idle investigation, the converse to teaching a parrot to talk. It might, as we shall be seeing in a moment, prove to be the most useful lesson we could take in a foreign language, the most valuable "other tongue," that we have ever mastered.

We used to be told that half our international difficulties would disappear if only we could talk to strangers, talk to people of "the other side."

Old George Lansbury, the gallant old leader of the British Labour Party, said on his return from the interview which he succeeded in getting Hitler to grant him, "If only I had been able to speak to him in German, or he to me in English. I am sure we should have got on further with each other!" And if you can't talk with a stranger who may be suspicious of you and why? has come to see you, then the next best thing is to have an interpreter.

Again the question arises: If we could get into touch with our bees, might not our power to communicate with them — or at least their sense that we were "communicable," sensible, rational, educable creatures — possibly come sometime to stand us in good stead? Could they not act as go-betweens between us and-----?

Well, we have to keep our minds open. And if our bees here and now, our bees which, like ourselves, are not nearly so old and advanced as insects could be on, say, a world whole geological ages ahead of our own — if our bees have a form of rational communication — quite unlike our speech but still, like our speech, conveying ideas — then might not that prove of immense use to us? If we could get into touch with them here and now (and there seems no reason why we shouldn't, since we have found out they have a language and do notice in a rational way the things round them), then they might be able to act as invaluable translators and interpreters when and if "bees" of a still more advanced breed swarmed upon us. Our bees might help to bridge the gap between us and those "others." They could indicate to them that, in spite of our unprepossessing appearance, our lack of method and order, our laziness-shot-with-violence, we are not really nor wholly creatures of blind instinct. That we are capable, on the contrary, if treated kindly and not frightened into panic, of reasonable behavior and of seeing things from our own interest and security. That we can at moments attain to detached curiosity, and even, some would hold, show compassionate interest!

"A truce to your fooling and insane speculation," cries the traditional naturalist. "Go back to the bees!"

"Bees *are* creatures of instinct!" the traditional entomologist calls back. "So much of their pattern — indeed all of it save this queer little anomalous behavior — is obviously unconscious."

Well, allow that you can tell whether someone who is doing something is conscious of doing it or not, by just watching them (a hard thing to prove). Does being able to do things "automatically" mean that you cannot be conscious, too, and at the same time? Not a bit of it. We know that when skill is very high, that is what precisely does happen. A very skilled pianist will go on playing beautifully while, looking over his shoulder, he talks to you about something he would like to have done. Perfect "automatic processes" are in fact a help to the creative and intelligent sides of the mind. Chopin said, "My left hand carries on, giving me the sound support I need, while with my right I feel my way out into new harmonies and airs."

So we can say the following things are clear about the bees. They have built up their amazing economy over millions of years — there is evidence of plan and design. "But it is fossilized," say the Instinctivists. It has certainly reached a marvelous perfection. But because it is and "runs itself," as we say of a perfectly planned business, that does not mean that the bee's mind has stopped thinking. It has no longer to think while it goes about the ordinary, perfectly fixed, finished and efficient traffic of the hive — as a *corps de ballet*, dancing a piece they have perfectly mastered, don't have to think but let their co-

ordinated bodies weave the beautiful pattern. But that does not mean that the dancers have become puppets. They can speak to each other and make shrewd remarks on the audience and the orchestra and on one another, while their automatic systems carry out the movements they have been taught.

If we did not have an automatic system of high efficiency, we should die. Fancy trying consciously to keep heart beating, lungs breathing, the proportion of oxygen and carbon dioxide right in the lungs, of hydrochloric acid right in the stomach — not to speak of all the endocrine secretions in constant play. We should be dead in a few minutes; and during those few minutes, in our desperate struggle to keep alive, we should appear distracted beyond all understanding, blindly absorbed in the mere internal effort to keep the machine from breaking down.

So automatism, instead of being contrary to, and the veto of, intelligence, is the necessary aid and supporter of any freedom to understand and to consider the outer world. We need not, we cannot and must not, assume that bees had their language from the beginning. It must have sprung up, as ours did, from the pressing needs of a close community life which involved making long co-ordinated journeys outside the hive city. Maps, charts, logs and all the gear of exploration grow as men have to find their ways into unknown countries and open routes to bring back distant products.

Now if the bees with us have been growing in mind, why should not insects in that insect world of Mars — so much more ancient than ours — have gone ahead? We should indeed assume that this must be so. Maybe they have had a world all to themselves. Certainly they have had geological time-spans longer than the bees here have enjoyed. But it may be said: "They have only mosses and lichens — braised moss for breakfast, lichen for lunch, perhaps dried centipede for supper — what a diet!" But these strange vegetables may have flowers as strange and wonderful as those extreme desert adaptations, the succulents, actually have. The succulents have succeeded in living in arid regions where heat and lack of water make a veritable Mars — and keen cold at night to make many plants wilt for good.

The bees have triumphantly specialized their diet even here, on our still lagging planet, so that they live entirely on the pure energy of sugar, strengthened with some vitamins from the flowers. On Mars they may have released sugar, as we are already hoping to do, by making a synthetic substance which, acting as chlorophyll now does, will, with water, air and sunshine, make the basic food, sugar — and, if required, starch too. As to the lack of abundant water — small creatures would not need our supplies; there may be plenty underground on Mars; and the bee-masters of the planet may have learnt, what we are hoping soon to learn (and the eucalyptus tree has already learnt), to get all the water they need by condensing moist air and making the drops run down into the ground.

Finally, we must add further to what has been glanced at above. We have seen that bees have amazing eyes as well as wonderful power of scent and quite probably fine hearing. Their sense equipment is better than ours, as their energy, size for size, is much greater. Their eyes alone are a wonder. For not only can they see polarized light and the polarized markings made by such light — they can also see by ultraviolet. They can see up into wave lengths to which our clumsier eyes are blind. It has been found that they respond to many flowers that seem to us dull and unnoticeable. Seen by ultraviolet light these blossoms are striking. Their eyes surpass ours in another respect. As dusk comes on, though we can apply an ancient form of sight — "night sight" — when we use it, not only is it dim but all objects appear to us colorless, drained of all tint. All cats are not only gray in the dark, as the French motto says; they are gray considerably before. But that is not so with the bees. As long as they recognize the object at all, as long as there is any light to see it, they see it colored as truly as we see it in full light. When we think of those eyes, we begin to wonder whether those upper-air cruisers with their baleful glare would really inconvenience a bee pilot as severely as it would us poor weak-eyed humans?

One further argument must be met. It runs: You said that bees are limited in their size. Even on Mars, where things that are smaller may count for more because the pull of gravity is so far less than on the Earth, how could such minutiae have built a fleet of space-ships — one of which may be a thousand feet across! — and brought them here? Of course termites build cities that are sometimes as high as a small house. But when we think of whether a space-ship could be built by a super-bee, we must remember two things. First, they are immensely ahead of the bees — or any insect — here. And when

we study the hive, even at the level we know, it is a pretty amazing piece of accurate skill and real engineering. Now they have speech, they may soon turn to use other materials than wax for the hive structure, though the plan may be so good that it will not be changed much.

The second thing we must not forget is that as soon as you have skill you can reduce force. In fact the formula, "The more skill, the less force," probably stands through every problem of manipulation. If people of a superior mind and station had watched us in the Roman epoch and, yes, right down to a hundred and twenty years ago, they would have said, "What pathetically and admirably industrious little creatures they are — but how slow and helpless they are in really tackling their environment. It is far too tough for such punies."

Then came steam and then oil; and now "bulldozers" cut out roads that gangs of slaves could never have made in a hundredfold the time; and dynamite, like a magic Thor with his hammer, bursts and shatters the rock that stands in our way. What will we not be doing with our present atom power if we don't first use it on ourselves?

"The more skill, the less force," however, means even more than that. When you have real skill, you don't have to unleash any kind of violence. Real skill means that force is exerted without explosion. Look at what even we have discovered about that essential power process, the tempering of steel, so as to give us our super-cutting tools. Once, tempering a quantity of steel was a scene out of the Inferno: The blaze of the furnace scorching any flesh left bare, giving cataract to eyes that dare to look into it. The hammering on giant anvils with bursts of sparks. The sudden explosive "quenchnings" as the hot bar was plunged into water or oil. Much, if not all, of that has been altered; for much tempering can be done with absolute quiet, with no indication that it is going on, by putting the bar between powerful magnets. It was the rearrangement of the atoms that gave the steel its new temper. The magnet will do that more exactly and with perfect quiet. Skill does away with force. When we think what our electrical and magnetic knowledge of metals will be in even another generation, might we not expect intelligent life geological ages ahead of us to have made inventions, by which, in as great a quiet as sugar or alcohol distills or water condenses out of air, metals, far harder and more resilient and lighter than any III now know, would build themselves up between the poles of some "precipitating engine" in the very shape that was desired, as a crystal forms in a supersaturated solution. As a matter of fact today we are experimenting with a new type of engine, a power producer, a "dynamo" of sorts which could produce and render ("step up") into serviceable amounts the small electric discharge which has been found to be released every time that plates of a certain structure are bent (the shifting of the atoms on the surfaces make a current). But to do this — that is to say, to get electric power in appreciable amounts — we must have super-crystals of a certain size and a certain perfect form. Crystals of this perfection and dimension Nature (always tending to work freehand) does not produce — so far as we have been able to find. So (for this project was considered sufficiently worth while) intensive research, after many trials, has now begun to produce artificially these giant flawless crystals. And this has been done by making a most ingenious "field-machine" — or super-saturation pressure vessel. In this the crystals, if they are started at quite minute size — "seed" size — build themselves up. This, no doubt, is a first step toward a new and "violence-less" way of producing, building up the parts and the gear we need for quite original departures in the plan and design of new power plant. We may soon be growing our engines instead of forging them.²¹

So we need not bring their physical weakness against a set of super-bees, provided their knowledge has, in the old Baconian phrase, been turned by them into power. And there is a rumor that we may have some little proof on this very one point. There has been a dispute about some slag offered for official assay because said to have been seen fall from a disk. The official verdict was "volcanic." But a persistent rumor says that one piece did not, when tested, show that it was any ore yet known. Yes, it is said to have had

21. Piezoelectricity (i.e., releasing electric current by bending quartz crystals, making them vibrate) has now given rise to two remarkable advances in power mechanism. The required giant quartz crystals (eight inches long) are made from "seed" crystals that feed themselves on a nutrient medium made of crumbled quartz. The engine powered by these vibrated crystals can yield already 2,000 volts at 75 amperes.

in its elements that are known on earth — titanium and calcium among them. But — and this was the odd and significant suggestion — the calcium was in such amounts that, though it made a wonderfully heat-resisting alloy, it was not one we have yet managed to forge. It would be a wonderful stuff, for instance, for the nozzles of super-jets — for that nozzle business is always a headache to all power designers now. For long we have been able to make flames, general heat, that were very high. The problem has been to find anything that would hold them, any duct that wouldn't melt, yes, burn like a candle, once you tried to lead the flame you had kindled in any direction you needed. We may learn a lot about metallurgy alone when we are permitted to examine, at our leisure and with a competent guide — we will hope, its pilot — a disk at rest.

But of course the best bee point, in this case for their being the Lords of Mars and the masters of space-ships, lies in the queer mystery which so puzzled Commander McLaughlin, the riddle of the "G's." Granted, as he maintained, that the disks are "manned" (and, even if there were doubts about the two-foot diameter saucers, there can be little doubt about the "manning" of big ones — one hundred feet across) — since these large ones make the same amazing acceleration, no creature larger than a large insect could stand that punch or kick. This fact, combined with the new evidence which we have just reviewed (the evidence that even our bees have now attained to sign-speech and the drawing of maps), makes it difficult to resist the conclusion that Mars is ruled by insects (we recall that astronomers have said that if there is mobile life on Mars, it would be insect in form).

The super-sky fleet that has now hung far up above us for some six years has also shown by its maneuvering that it could be "manned" only by crews that had the resistance to pressures which an insect possesses. For we must remember that it is not only smallness which gives an insect its immunity against the crushing force exerted on a body when it is accelerated in any gravitational field. The strength of an insect body is much greater than ours. Its structure is amazingly tough. We are so much soft tissue wrapped round slight rods made of lime. The insect keeps the soft paste, which makes its interior, shut up in curved cases made of the strange, wonderfully tough material we call chitin. This carapace armor will, we know, considering its lightness, stand extraordinary pressures.

Just possibly the possession of this kind of frame might permit a Martian insect to emerge onto this our world. Certainly if the Martians were of any form similar to ours (a soft body wound round a skeleton of light structure), then they could never hope to set foot on this world. They could cruise about in their disks. But, as we would have to wear all-over armor on the Moon (to protect ourselves from the lack of air, and at night from the appalling cold, at day from the blasting heat), so the Martians would have to wear closely locked coats of mail here, but for the reason that we have too much air, at least at ground level. The sheer weight of that blanket of atmosphere exerts, we know, fifteen pounds of pressure on each square inch of our bodies. While on Mars, it is generally agreed, the pressure on bodies is only two and one-half pounds.

Another factor which would make a manling from Mars helpless on our earth would be the gravitational pull. A creature evolved to stand up against the drag of a mass which is only some 4,200 miles in diameter, here he would have to endure the down-drag of a sphere nearly 8,000 miles thick. On Jupiter, could we ever reach it and make a landing, we should have to crawl flat. To raise ourselves on our elbows might well be beyond our powers, so close would the giant planet's mass hold us to its breast. A Martian of any kind, of human, mammal or indeed any build but insect, would be in much the same situation on this Earth as we would be on Jupiter.

But if he or it were an insect, he or it would have the intense strength which insects show here. Their flight alone, their wing power, is the release of an energy which an elephant might envy and a tiger retreat before. Their four-wing "vortex flight" is real flight, not the clumsy skidding and flapping on the air which is all the birds can do, and which we, somewhat more clumsily, imitate. Indeed, that fact of their wonderful natural flight may have been what first turned the rulers of that red insect world to think of artificial flight, as we know birds' flight made envious man aspire to follow them into the air.

Of course we must add a further note on this problem. One of the reasons for thinking that insects may be "manning" the disks and tubes is because any creature larger and less armored than bees or ants,

could not stand the "G's," the tremendous gravitational pressures generated in these vehicles when they switch and plunge in their characteristic manner. There is of course an alternative explanation. For if these crafts' inmates are — through the very fact of their peculiar powering — in their own gravitation-cancelling field, then they would no more feel our gravitation pull, than we feel or are incommoded by the sun's enormous pull. In this case, then, they needn't be insects. If we like, they might be humanoid. The human figure is in many ways very effective. Perhaps other planets have chosen this particular model (as life did here) as their prize-winning product and style.

CHAPTER THIRTEEN

Were They Preparing?

BUT, it will be said, if the red insects were getting ready to visit us, might we not have detected the first signs that they were preparing to make a descent? Has not Mars been watched as none other of our fellow planets? For has it not always been the one which was most observable and which, because the surface is so naked of cloud, permitted us to observe and gave us the most points of interest to consider? We know this is true. We have seen that no other star has raised the temperature of astronomers so high or made them flush so hotly. The whole surface of the planet has been mapped with wonderful care — in spite of the difficulties presented (which have made good photos with sharp detail till now impossible). The canal controversy has been mentioned above. Everyone has views about Martian engineering, pro or con.

"Well, then," it will and should be asked, "well, then, when the canals were being detected why did no one discover the preliminary plans for the larger venture? This descent could not have been planned in a moment. We should have been able to detect the first tentative pushings out, the launching stations. Why didn't we?"

The answer, strange to say, seems to lie in the fact that we didn't know what to look for; so that when we found it, we didn't know what to make of it. For, quite early we did discover something about Mars that was harder to explain than the canals. For the strangest thing about Planet Four is not something on it but, literally, something about it. Or, to be exact, we should say somethings — two things — about it.

In August, 1877, Mars made one of its "nearest to the earth" approaches. Every fifteen to seventeen years — and particularly in August — Mars and ourselves are nearest. The last very good time was in 1941. The next very good rime will then be about 1956. When in August, 1877, Mars had come close, Asaph Hall of the Naval Observatory, Washington, D. C, trained the twenty-six-inch telescope on it. On the night of August 11 he made his first great discovery. At first he could not be sure. Then he was certain — there was a minute body racing round above the surface of Mars — Mars had a satellite, a moon. On the seventeenth he had found another and it was even closer to the Martian ground. The two were amazingly small. Indeed they can't be properly seen at all. We see them as we see motes in sunlight, things too small to be seen in themselves but noticeable by the flash that the sunbeam strikes off as it touches them.

So in spite of all attempts to gauge their size we cannot say what they are for sure. If they are of a dull texture, why, then maybe the smaller — which is the outer and has been christened Deimos — may be ten miles big and the inner — called Phobos — may be a trifle bigger. But that measurement depends on the assumption that these objects are chunks of globular rock — moons cast off out of the Martian earth, as our Moon is supposed to have been cast off out of us (a theory which in any case has many critics today). This old-fashioned theory would say, then, that these two midget "moons" would be of the same shade as their mother Mars. But, of course, if these two satellites were made of a brighter substance than ordinary Martian earth then they would be much smaller. For the flash they give — by which their size is gauged — could come more brightly from a far smaller body, if that body were for instance a gleaming globe or disk.

Anyhow, though the astronomers of pre-air-war were not prepared to speculate or even to imagine

man making a synthetic satellite to circle this our earth, they were puzzled and hard put to it to explain these anomalous "moons." They were surely very odd. Phobos, the inner — which incidentally flashes the more brightly — is so near the surface of the planet that it has to go at an immense pace to keep from crashing (speed, by raising centrifugal force, counteracts the centripetal drag of gravitation). It rushes round so fast that it gets right round its mother planet in one-third of a Martian day-and-night (diurnal rotation). This of course must have a funny effect upon those looking up at it. To relieve the monotony of the whole heavenly host rising in the east and setting in the west, this small intimate "moon" entertains lookers-on by rising in the west and setting in the east. It gets round Mars twice while Mars itself goes round once. On the other hand, the other midget "moon" behaves in an oppositely odd way. For Deimos, which is some distance farther out from the Martian surface, seems as tardy as its lower companion Phobos is hasty. Deimos' period is only six days greater than the Martian day. So, to those looking up at it, it appears to go so slowly that it takes two days between rising and setting!

What was anyone to make of such "moon" anomalies? The astronomers of prerocket days did their best. They speculated mildly. They did suggest that these old companions might not be specks of eruptive Martian matter that the planet had once spewed out. Then what? Well, they might be captured asteroids. We have already in this book mentioned the asteroid belt tying out beyond Mars on the way to Jupiter. It will have to be mentioned again, for it may have a very serious part to play in this story, this disk drama.

Here we must say that the capture of a stray asteroid by a planet is not an impossibility. When in 1932 what was then called the Reinmuth Object, and has since been named Apollo, in its plunging through space came within twenty minutes of the Earth, we might well have found ourselves with a midget moon — if indeed it had not made a direct hit, when we would possibly have been worse off than if we had set off the Hydrogen Bomb. (By the way, those who think that we are hopelessly panicky should take comfort by reflecting that though this small star was within twenty minutes of ramming us — with inconceivable results — no one showed anything but the faintest curiosity in the encounter. The writer knows, for he was making the commentary on current science on the radio in London then.) But "Apollo," as it has since been named, went off and hasn't made a lunge at us since.

So the capture of asteroids and their becoming sham satellites seems to be rare. As far as we know, as far as our eyes tell us, asteroids, meteorites from the asteroid belt, are always drifting in toward the sun, in from their orbit, as leaves fall in autumn. We only see those that graze through our torpedonet of the atmosphere and are there caught and through the friction burn themselves up into harmless dust. Mars has a much smaller gravitation field to attract such visitors than we have. Hence it would have less chance of being molested. If we have escaped, it has a better chance of escaping.

The surface of Mars seems innocent of scars when we think of our own surface and the pockmarked Moon, our satellite. Mars seems to have cooled before volcanic eruptions took place. Lowell thought that it had only one low range of mountains reaching the very moderate height of 3,000 feet, the Mountains of Mitchell near the southern pole. Had Mars been often hit — as many of the vast craters on the Moon are now thought to be "bullet marks" made by meteorites that have struck full force on the Moon surface (unscreened by an atmosphere) — then on the Martian landscape we should have seen these great rampart rings. Some on the Moon are thirty miles across and throw most striking shadows. But not a trace of such rings has been detected on Mars.

When, therefore, Dr. Walter Haas, Director of the Association of Lunar and Planetary Observers and Mathematics Instructor at the University of New Mexico, reported that a Japanese Fellow of the Association had sent in a report of an explosion on Mars on January 15, 1950, powerful enough to have been observed through the eight-inch reflector at the Osaka City Planetarium, Dr. Haas's explanation, that the explosion was probably of volcanic nature, does not seem borne out by the nature of the planet. If it has never had volcanoes before, why should it start having them now? But if at last intelligent life is making a great effort to command sufficient power to take a decisive part in Planetary Politics, then we might expect that "a cloud of dust sixty miles high and billowing out for nearly one thousand miles" might mark another milestone in the Martian progress in releasing energy. We must only hope that this progress

has not brought them dangerously near that limit of planetary stress and power of cohesion which was passed by the planet that once was Mars's outer neighbor and now is so much space-flotsam.

The theory that these two very odd satellites of Mars are asteroids, captured meteors, is then not very strong. But some theory is needed to account for them. They are anomalous. But no other theory was possible for respectable astronomers before the almost insanely inventive power of engineers began to show the skymen what could be run up into the sky, and, further, began to calculate how you might not only pierce into the space beyond the atmosphere, but actually fix things up there in the empty vault of the sky.

We have seen that we do now definitely plan as our first step out into space, and as a diving board to launch us to the Moon and so on to Mars, a synthetic satellite five hundred miles out, and then another, a still farther out jetty, to lie or ride on a still farther orbit. We say it is possible and that it will be the way to launch spaceships. (We also plan that our synthetic satellite shall circle our planet in two hours. Phobos must look to his speed laurels!) Very well, would not a people ahead of us do precisely the same thing? If what now actually rides above us (a space-fleet with a mother ship of great size) came from Mars, then we should expect to sight, just off the surface of Mars and speeding round it, the two similar launching jetties of the type which we intend to place round ourselves.

In the super-disk soaring round us, say five hundred miles high, we have this end of the arch of thrown traffic which has its base "springers" in the two so-called "moons" of Mars, Phobos and Deimos. We have accounted for the anomaly they present and we have found the very proof that we were rightly asked to provide. If they have come here, then surely there should be proof and sign of their preparations, preparations which would have actualized and fulfilled the counterplans — the plans for our space-voyage — which we have already made. We should be able to sight their home-base ships from which they launch their Mars-to-Earth flights. We have!

As a postscript to this chapter, we may add one other possible objection to space-flight (and so to space-visitors). It has been raised: and the answer to it, as a matter of fact, may rather confirm than weaken the hypothesis that we are already contacted — that our visitors have by now arrived safely and are waiting out beyond our farthest atmospheric doorstep, outside our extremest "territorial waters" limit, or "territorial airs" frontier.

It is known from the routine reports of upper atmosphere exploration by the rocket launchings at the White Sands, New Mexico base, that possibly one of these great record-carrying rockets did not return. It may not have crashed at any spot at present known. It is unlikely that it fell back on United States territory. Just possibly it plunged into some part of the vast Pacific when no one was by. But there is a rumor that the theodolite team tracking it had it in view until suddenly it vanished. That might mean three possible things:

(i) That it penetrated some blue layer of high sky, some outer atmospheric stratum, which (at that hour at least) was impenetrable to our sight. Because we can see the stars at night, that does not mean we can see them by daylight, and we all know how wraithlike even the moon looks when the sun is up. This rocket may then have vanished but gone on — up or down.

(ii) Could it have gone on and up, shaken off the grip of our world and become an asteroid on its own, a midget planet, a free meteorite? There is reason, however, to presume that it was not going at the 18,000 mph which is the speed calculated as necessary for a rocket if it is to free itself from the down-pull of the earth's gravitational field and escape into space.

(iii) If then it did not escape, or crash on some unobserved part of our globe — if indeed it vanished because, as they watched, it actually dissolved — what could have caused that sudden destruction? It may have run into something. Here again there are three possibilities, three possible obstacles it may have struck.

(a) The first will occur to everyone. It was hit by a meteor, a meteor which at that almost airless level was neither pulverized nor checked by atmospheric friction. But experts on meteors think the sky is not thickly sown with them. And if they are fragments from the asteroid belt and/or solid spray of a comet's tail, they cannot be so common in a space as vast as the solar system.

(b) The rocket blew up, burnt in a moment to dust, because it ran into such heat that it was pulverized. Now of course we have to face up to the odd fact that it is not true to say (as we had for long assumed) "the higher, the colder." The highest atmosphere (and maybe outer space) may be said to be hot quite as much as it may be said to be cold. How? Heat is caused by molecules' rapid motion. They move very rapidly at the top of the atmosphere. Hence it must be hot. But, on the other hand, though these molecules move very fast, there are very few of them. Which would make you feel warmer — a mild hot-water-pipe system round your room or a dozen oxyacetylene torches dashing about hundreds of yards distant? So neither (a) meteoric knockout nor (b) high-atmosphere-heat incineration could account for a massive rocket's disappearance. There remains then only:

(c) It was hit, hit intentionally. And if an artificial satellite has been "planted" at our side — if the crew of this space-ship saw rushing up toward their orbit this dreadful derelict torpedo — if they knew (from their White Sands intimate study of such a rocket on its way upward) that it was "unmanned" and also "flying blind" — they would of course shoot at it, to get it out of their path. For they might well think, "This is the first trial at an artificial satellite on the part of the Earth creatures. And if this object can establish itself on the orbit we have now chosen and taken, it will be a constant collision danger to us on our routine traffic lane."

So the masters of a space-ship "riding under our lee" must argue and act. And if it is claimed (as it is) that the Nazis' "artificial satellite project" was to launch such an orbital ultra-atmosphere ship, and that ship was to destroy our cities with heat rays (generated from the unscreened sun), then the present launchers and masters of the satellite space-ship would have such a ray which could vaporize the errant rocket. Its sudden disappearance would then tell not against space-travel and their being space-shipping in our offing, but in favor of such a theory.

CHAPTER FOURTEEN

Why Now?

THAT is the next question. Have they made the springers for their space-bridge? Have they "floating jetties" riding at gravitation anchor off their own bow? (We do not know how long they have had them — we saw them first in 1877 — but if Martians are as much ahead of us as their planet is more advanced in its development for dry-land life, then they may have been out sailing in their synthetic satellites, millions of years age.)

If we whose Earth is still more than three-fifths water-covered and who have only climbed onto the air in power craft during this last fifty years, if we now have rockets that have gone 250 miles above this Earth's surface (the "two-stage" V-2 WAC Corporal rocket — the V-2 giving the kick for the first part of the flight and then falling off; the WAC Corporal then, having reached the really thin air, being able to make, at the highest speed yet known, the second part of the climb) — well, if we have to face such a conclusion, then at least we can make one objection still to the whole thing. Granted they could have come long before, why in the name of Space and Solids didn't they come before? Would we have waited? You bet we wouldn't.

But that argument is not conclusive. Indeed there is an old motto that suggests why Martian insect brains may have thought and thought again before taking the plunge: "The fool rushes in where angels fear to tread." Then why do they come now? Again the proverb may have a meaning for us.— If you are an angel, a skeptic once remarked, it is easy to abstain from rushing in, because you don't have to tread — you fly.

They have flown, and even now they don't alight. Are we sure they don't inspect us ever so often — are we sure that they haven't been paying periodic visits just to give us a look over? We have no such negatively reassuring certainty, nothing of the sort. Indeed we have considerable amount of positive evidence — if evidence means anything, and is not crushed flat under the slam of the expletive, "Incredible!" We have considerable amount of evidence that we need no longer have to dismiss as nonsense, now that we know that high-sky riding is possible and, more, that more people may be at the

game than ourselves.

For years a patient but strange and provoking student of science worked through painstakingly the special papers of the various learned societies. He could have been a professor with the amount of knowledge that he had collected — and he wished, not to find facts, but to support current theories. But he did wish to find out as many odd facts as he could; he did not want to link them up with each other or any orthodox theory, religious or scientific. Emphatically he did not want to support the professional scientist; and it amused rather than shocked him when he found that facts contradicted the textbook. He didn't like hypotheses. After all, Isaac Newton felt the same! "*Hypotheses non fingo!* — I don't touch hypotheses." He strongly objected to hypotheses being dressed up and called Natural Laws.

This student, Charles Fort by name, finally had collected enough material of "Anomalia" to fill four large volumes (the main stuff can now be had in one). Part of his great study deals with strange "airships" viewed before man had any. The subject is so full that there is not room here to spread it out in its amplex. Briefly then, there are references going back to the eighteenth century. During the nineteenth they continue and become more numerous. By the last quarter of the last century they have come to be not infrequent. Twice in 1870 — the year, incidentally, of the Franco-Prussian War, when it was clear that Germany could and now would make a bid for world power — skyships were seen. On August 1, above the Riviera, very high up and seeming to move slowly, there passed a globular body that must have been of great size. The September before, on the twenty-sixth of the month, something was seen high up at night, an elliptical body that, for half a minute, was watched crossing the moon's face. It seemed to have some kind of fan or rudder at its stern. This reminds us of the object seen high up by the watchers at Idyllwild, March 22, 1950.

Nature reported in 1880 the bright luminous globes moving high up in the sky, that are still seen. (The latest report, August 2, 1950, is from San Rafael all the way south along the Pacific Coast down to the San Francisco peninsula.) The *Bermuda Royal Gazette* in 1885 saw an unidentifiable "thing" high in the skies over the Islands. Then, the same year, Adrianople in European Turkey was visited or looked down upon by a "disk." The observers gauged its size from that of the moon. Though the object was sailing high, it looked several times larger than the disk of the moon. New Zealand had a fast moving oval to report from its sky in 1888. In the early nineties the Dutch East Indies were inspected — in this case by what seems to have been cones, a pattern that may now have been discarded, though one or two present-day references seem to show that a triangular-shaped craft has been sighted over America during the present visits.

On they go, like the slow drip of a tap, like the slow gathering of a drop. Every couple of years or so they are sighted. A disk with a rudder or fan was reported by a British battleship in 1894, and in 1895 triangular high-sky objects were seen by many in England and Scotland, and, of course, dismissed as illusion by officials and experts — who hadn't seen them.

Then came the turn of the United States to get more than its share of the high-sky limelight. The year of the Victoria Diamond Jubilee gave a number in the United States a sky show. Beginning in the second week in April, the "ship" made a tour of the Middle West. And it was watched through telescopes by astronomic students. From their accounts — cigar-shaped with short wings at the side — it may have been the "tube" model in one of its earlier forms, the tube model that has given such remarkable demonstrations of its performance to air pilots. The tube, too, as we know from those today, emitted strange lights. In this case they flickered much and ranged in color — as have some of the lights we now witness (but in these later cases they seem not to be attached to any craft we can see). In this 1897 case the colored beams ranged from red to white and on to green and wore such patterns that it was thought the ship was signaling.

Of course no one succeeded in making a contact. So the ship moved to the Atlantic States, and the Virginia town of Sisterville was roused to find itself being scanned by searchlights that wandered over the countryside — seeking what? The red and green lights showed along the sides of the ship, which seemed two hundred feet long and had small flukes at its sides.

This cigar model, in the summer of 1907, sailed over Vermont, and after it was gone an explosion

took place in the sky. But when, a year after, Massachusetts was visited by the same or a similar craft, it played only with its searchlights, as it had when visiting the Middle West and Virginia. In 1910, on a January morning, the cigar appeared silver. It cruised about over the State of Alabama. Two years after, *Popular Astronomy* carried a careful report of a black object crossing the face of the moon. There were not many reports after that. West Virginia got one visit in 1919 but, thinking of course that it was a dirigible from some home base, they felt no disquietude. And when it was later reported that no domestic or foreign (from an Earth point of view) dirigible was then aloft, by that time people naturally had begun to think of something else.

There is evidence, however, that when World War II started, there were uninvited visitors looking on. Were the Allies' flying officers always deluded when they thought that sometimes they were tracked and even accompanied by small, fast-flying little disks or globes ("foo planes" they called them)? Certainly after the war most of us saw notices copied from the Swedish newspapers of strange fiery vehicles that swept across the Swedish sky. But knowing Sweden's position and proximity, most people were certain they could only have one explanation. Still these references didn't all come from Sweden — they spread until in most months, or even weeks, you could pick up a reference to some sighting through Europe and even in North Africa.

And then America came into her own. Being the foremost flying country, she had a right to foremost information — and, possibly, inspection. The year 1947, we have seen, was a great year — perhaps the great year. But June, though it set off the great interest that even now cannot be quite distracted, was not the month of the appearance of the new crop, the new flush, of sightings. They began to blossom in April and the first was a theodolite sighting — the user of the theodolite was tracking a weather balloon. It happens to be the first case in the file of sightings which Project Saucer released when it dissolved.²² May yielded two saucers, one from Oklahoma and another from Colorado.

So we see one thing: These visitors have been seen before. We may add another, that they first paid more attention to Europe and then increasing attention to the United States. We may close with an obvious deduction — that they were first interested in Europe because it was, a generation ago, still leading industrially; and that they are now more interested in the U.S.A. because it has taken world leadership in industrial production. We may perhaps add a rider: they may be coming at certain times (and hovering over certain places or countries) because they fear what our industrialization seems to lead to — intensive wars that drive us finally to the air, to rockets, to atom power, to the capacity not only to destroy ourselves but to make into a kind of cosmic bomb "the great globe itself, yea all which it inherits."

We see then that the visitors have been coming before — how long before, no one can say. We may add that — as they are adapted to their climate and, being very able, may be very content there, and do understand how wonderful it is to fit well into your place — they may be quite unwilling to change places and have not the slightest intention of interfering with us, provided we do not interfere with them, either by invading them or by upsetting the solar system appletart from which they draw as much as do we. And we have seen thirdly that they have very good reason for looking in far more often and far more carefully than they used to do before, now that we are up to really big mischief. Why are they coming in such numbers now, no longer as "single spies but in battalions"? Because we are a peril to them, seems the only sensible answer.

But are we, can we be, a peril to them? It won't be generations before we begin to think really in schedule terms of even going to the Moon. They will have warning enough and time enough when they see us launch our first synthetic satellite. But the danger might be much nearer and much more emphatic than that. A bad boy with matches, out in a barn that not only adjoins your house but is full of hay, is really a far more immediate peril than a burglar who is loitering half a mile away, on the other side of a boatless river, merely looking with idle covetousness at your distant lit windows. Seriously then we must ask, Are we a peril to them? Is there, we may add, anything in their past history to make them suspicious

22. But the comments of the sighter are not given. So we cannot rate this theodolite record with the other two (those of Mr. Hall of Emmett, Idaho, and Commander McLaughlin of White Sands, New Mexico).

of their neighbors and of the harm a disaster to a neighbor may do to them?

We are all, on our planets, like men on small craft in a big ocean. We ride the tide but we have to be "seashape" to do so. The precise balance and poise of a planet as it rides its orbit and spins on its axis and rocks on its poles — so giving years and seasons and days and nights, which in proper mixture are as necessary to life as air is to a man iloating on the sea — that balance and poise is as delicate as, and scale for scale may be more easily upset than, that of a ship. We find it hard to believe that. But it is true. There is some evidence that the Pole of our Earth shifts fairly easily. We know that the Magnetic Pole is always rocking and that the "third motion of the earth" is its waltz on its axis.

There are, too, some evidences from geology and paleobotany that would seem to show that the earth's pole may have shifted considerably, very seriously, in the past, and in the not too distant past. The coal measures at the Poles may be accounted for by the fact that when these measures were being laid down all the planet was hot and steamy under a white thick coverlet. But when we find fossils of the magnolia, and other "modern-type" trees which like sun and warmth, in what are now Arctic rocks, we begin to wonder. Further, when we find remains of the grapevine, in Lapland, again it suggests a very considerable change of climate and a warm if not hot North Pole. Thirdly, South African geologists point out that nearly all the "erratics"- — the boulders of alien strata and often of immense size that were carried across countrysides and now lie where they were deposited by the glaciers of the Ice Ages — in South Africa seem to have streamed not up from the south, but to have come down, in a northwesterly direction, from what is now the Equatorial Atlantic. It would seem we have a serious problem here, perhaps best answered by assuming a shift of the Poles.

But granted that the Poles could shift, could we tip our axis by firing off a bomb? We must remember it is a risk. For when the deep-sea firing of an Atom Bomb was suggested, as part of the Bikini exploit, a Yale Professor Emeritus of Chemistry wrote begging that this should not be done. He felt that it was clear to all geophysicists that if an Atom Bomb were exploded in the depths of the Pacific Ocean close to the Equator, this would give a maximum provocation to the Earth to "heel over." For the weight of water that lies in the great troughs of the Pacific, the greatest oceanic depths in the world, is so great that if it were suddenly raised or partly lifted, the ocean floor, already (or at the same time) having been given a tremendous blow, might buckle. We know that when so small (but till then unfamiliar) an engineering undertaking as the cutting of the Culebra channel was made (when the Panama Canal was being constructed), to the surprise of the engineers, as this large mass of earth was removed, the exposed lower layers which were to be the floor of the canal actually rose! The weight lifted from them, they buckled.²³ The so-called crust of the earth is a much more springy and balanced thing than we have supposed.

We often talk of the Balance of Nature. But by that we generally mean the adjustment of one species against another — for example, if there are many birds the insect population can be kept within proportions, but if many cats are introduced then the insects will increase. But evidently when we get to the super-engineering we now employ, when above all (or perhaps one should say "below all") we start rousing up the basic energy of all matter and loose atomic power, then we must take care. The solid Earth is not at all so solid. And long before we start vaporizing it, we have to warn ourselves that the firm Earth is not at all firm — it spins.

So if the bomb at Bikini had been made a depth bomb and had lifted that mass of water (as well it might, turning vast volumes straight from water to steam), then up the floor of the ocean might have come (let alone the super-hot "magma" from under the "lithosphere," the rind of rock that insulates us from the infernal heats). Then the sudden bulge on our belt — this rotational rupture — could have sent us onto another spin, another slant. Whether this scientific adviser was right or not, we may never know for sure. But that his advice was sufficiently weighty we may judge. For though the surface blast was

23. Accurate measurement has now for years shown that though the British Channel is at the Straits of Dover only some three hundred feet deep, yet such a weight of water, when increased by only the additional volume of a high tide, depresses the Channel floor by some eighteen inches.

proceeded with, the depth Atom Bomb was never fired. The project was abandoned.

But, since the question with which we are dealing now is not our convenience but the inconvenience our antics might cause Mars, even if we tipped ourselves up and so ruined the world climate for good, would that gravely perturbate the Martians? Evidently planets can get their poles pointing straight at the Sun. Uranus has a moon that, as far as can be judged, is in that position toward its mother planet. And some astronomers have thought that perhaps Venus so spins in relation to the Sun (for the white blanket that wraps Venus is so uniform that it is hard to be sure that globe is revolving). If so, it is a bad outlook for the future of life on Venus. For as soon as the cloud lifts or breaks, then good-bye to any further development of biotics. Because then one side will be baking like a furnace and the other be far colder than any refrigerator, while along the edge "where night meets not dawn — but a white hell" there would be a tempest like nothing on earth as the shreds of the torn atmosphere were rushed and dragged from the space-zero cold to a heat which might well break up air and scatter it out into space.

But if that is so, Venus spinning "on its side" and not upright has done us no harm. Nor is there any reason to suppose that even if that change of poise has taken place during the time that life has been on this planet of ours, the change has been at all harmful to us. (One is leaving aside the temerarious speculations of Dr. Velikovsky — that in the last four thousand years Venus skipped in, in the form of a comet, and took up her present station, badly ruffling our feathers as she rather unceremoniously hurried by, coming so late to the planets' party.) Why then should Mars be concerned because we might reel over and lie like a drunk man? We should still be spinning round in our orbit, our original orbit round the Sun — still a safe fifty million miles or so from the Mars orbit-path.

There is, however, another danger which really might inconvenience Martians. We might blow up. Dr. Jeffries, who is one of our most eminent geophysicists, thinks that all planets may suffer from internal strains, tidal stresses in their cores. He believes that the Moon may yet blow up and present us first with some splendid rings, such as Saturn alone has boasted till now, and then (not at all so nice!) the Moon fragments would fall from this belt and make a real belt, a huge mountain range of debris all round our Equator.

The Earth's rind of rock, called the lithosphere, mentioned above, may not be at all thick. It may be possible with our modern atom-power explosion to burst through it. Then, quite likely, out would come our molten insides. The famous explosion of Krakatao, in the Dutch East Indies, gave a small but awesomely impressive demonstration of what that sort of pyrotechnic display might be. There part of an island, which was volcanic, blew itself into the ocean and the Pacific took up the challenge. For some time internal heat and vast ocean had some exciting rallies. But before the dispute spread, somehow a patched-up peace was made. If, however, the gap had been large enough, there seems little reason why the dispute would have closed so long as there was fire not put out by water and water yet to be vaporized by fire.

Yet is not this, on a world-wide scale, merely speculation? Perhaps one day planet by planet the whole solar system will go pop. But it hasn't so far. "But soft!" — as old-fashioned dramatists used to make their romantic characters say — is it true and demonstrable that no planet has as yet blown up? Certainly not. As long ago as the twenties the great Swedish astronomer, Dr. Ludblad, had introduced to the astronomic world his theory of the asteroids. He maintained that they were the wreckage and flotsam of two exploded planets. The theory met more and more of the problems that this welter of planet fragments does arouse. In the first international astronomic conference held since the war, it was generally decided that there was a planet on the orbit now filled with rock-wreckage (some the size of islands — e.g., the asteroid called Ceres). It has been called Asteroida.

What sort of place does it seem to have been? First of all, it is estimated that its size was somewhat about the size of Mars. Being out still farther from the Sun, it would be as much "further ahead" — more advanced in development — of Mars, as Mars is "further ahead" of us. Secondly — and of this we have direct evidence of a sort that we have about no other star nor any of our planets, not even of the Moon (unless the "tectites" are fragments chipped off the Moon by meteor hits and rebounding onto us, as dust may fly into your eye when someone throws a stone at a wall) — secondly, we know what the asteroids have, and so what Asteroida had, as their geological structure.

There are two sorts of stranded asteroid, two sorts of meteorite. As these fragments, dropping out of their faraway belt, drift by on their way to the Sim, and get now and then captured by our gravitational field and so (if not burnt to dust first) fall on our surface, they are found to be of two types. One is lithic — rock fragments, rock fragments that have been found to contain all the minerals, all the elements, that we have here and none other. (There is also a persistent rumor that researchers have found in the hearts of these sky-stones — and so perhaps protected from the awful cooking they go through when trying to get through our atmosphere — low bacteria. But this has never been confirmed, for the bacteria may have been introduced since the rocks have been on this earth and indeed while they were being examined — it is hard to keep bacteria out when they are about.) The other type of meteorite is metal, nickel iron. Now put those two facts together and the conclusion is hardly escapable. For our Earth is constructed the same way — a rind of rock and a great heart of something that weighs exactly as though it were nickel and iron.

So it seems clear that Asteroida was a planet like ours. And it blew up. Its explosion may well have marked a turning point in Martian life. It must have been a terrific sight, and on Mars, with so little atmosphere to screen it from cosmic missiles, when the first shower of the pieces began to fall in toward the Sun, life must have been for some time like a bad air raid. Martians, we then need argue no further, might well have strong views about planets that explode themselves. Sky suicide, a world committing *felo-de-se*, is no private matter. And our explosion might be more serious for Martians. True, we would not let the fragments of our big body fall on them. But we might do them an even worse turn. For turning ourselves into a dust belt, filling our entire orbit with a thick mist of fragments, we might cut off a dangerously large amount of the all too little sunlight they now get.

A cosmic cloud of fine dust particles, into which our solar system ran, is now perhaps the safest explanation of the last terrible ice age. Only lower the temperature a few degrees for us and we'd have the ice back — and then good-bye to our present civilization. Maybe it was Asteroida's fatal antic that did produce enough dust to cause us to have our last paralyzing glaciations. So Mars could not consider with complacency our fouling by even one per cent the pelucidity of the solar system sky. And we must remember that we and Mars are practically on the same plane, so that even quite a fine belt of dust made by our fragments would be exactly right to cut off from Mars her desperately needed sunlight. No, they could not view our dissolution into dust with anything but acute concern. In fact we just mustn't do it, as far as they are concerned. This is no private matter. It is an acute problem of planetary peril and public decency.

There is still a further and maybe a far graver risk that we with our ridiculously disproportionate powers (disproportionate to our self-controls) are running for ourselves and for the Martians. The little belt of mist which we could create by pulverizing ourselves and leaving our coil and ring of smoke neatly to cut off the Martian sunlight — that blanketing procedure might fail. We might disintegrate wholly or into such large fragments as not to form a belt of fog. And this is speculation for the future — perhaps clear deduction for the Martians, with their much greater powers of calculation arising from their far advanced knowledge of the powers with which we are now monkeying. But what is not speculation but clear observation may have a far more perilous meaning.

Just at the very time that we chose to fire off our Atom Bombs — with very considerable wantonness considering our abysmal ignorance of the consequences — just at that very time, no less an important body than the Sun itself I chose to "act up." We know that the largest sunspots that have ever been seen on the face of the Sun did appear just at that time. "*Post hoc, propter hoc*" say the conservatives and reactionaries — "Just chance association." We did this and then out there that happened. But we must remember we have no other way of finding out the connection of things than by making something happen and then watching all round and everywhere to see if anything out of the common occurs in consequence. And there is no denying that when we made use of our super-force, when we released for the first time atomic energy, then the Sun did do something we have never seen before — it did produce it the biggest spots ever recorded, monster things.

But of course our puny efforts could never affect such a monster body — why, into one of those

spots you could put twenty of our worlds laid out in a line, and then they might not quite stretch across it! And yet there is such a tiling as "trigger action" in the universe. A catalyst in one part in a million, and indeed less, can set off a complete reaction. A virus not a couple of molecules across can explode a deadly disease that will reduce our monstrous bodies (compared to a virus) into a heap of decay.

Further, when we come to study sunspots, the actual things, we find they are profoundly queer and profoundly powerful "centers." They seem to be vortices, frantic storms that tear open the photosphere — the dazzling blaze of flame that is the Sun's outer "skin." And then out of these monstrous "gun ports" there is shot intense shortwave radiation. They are whirlpools of short radiation or, as we used to call it, the light that is beyond light. They are much more penetrating than ordinary, visible light. They pierce into our atmosphere, derange all our radio, cause — there can be little doubt — all sort of mutations in the genes, the heredity-bearing units, in living creatures, profoundly upset the weather, alter the crop yield and, maybe, cause sudden rises of insanity and hysteria by attacking our nervous system. Yes, sunspots are no joke. They are problem Number One in celestial forces.

But we couldn't be a provocative of such tempests! Are we sure? We do know that the pull of the planets does make for one of the causes which brings about the periodic — about every eleven years — cycle of sunspot activity. We know also that they are magnetic fields. Now the Earth is a very powerful magnetic field. Its huge heart of nickel iron — a heart perhaps huger, considering this globe's actual size, than that of most of the other planets — makes it a very powerful magnet and it is comparatively close to the Sun. Could it be a trigger-piece in the sunspot explosion rhythm? Is there any evidence of this? Yes. Observations made in France in the twenties seemed to show what then seemed a highly anomalous fact — that as a sunspot comes on the face of the Sun and as the Sun spins round, so that it begins to face directly toward us, its shape changes often. This fact was noted as odd, very odd. But it would seem to suggest that we, though so small (even when we are not playing with atom power as a catalytic aid to cataclysm), do make the sunspots alter their behavior. Lastly, the Martians have the strongest wish that we should not increase the short-wave radiation from the Sun. Astronomer after astronomer has pointed out that one of the reasons why it was hard to accept life on Mars, even vegetable life, was the fact that the Martian atmosphere was so thin that they had not enough protection from the short-wave rays from the Sun that are deadly to life — at least at the stage we know it — and that anyhow, in sufficient force, must make the high balance of the living cell and of the gene impossible by breaking down that delicate organization.

There is, however, a far greater risk, far greater than just making the Sun sterilize all of us — yes, and give us "X-ray burns" that would kill us. A few of us might survive — some of us here and some of us on Mars — for in this matter we would all be of the same family, the family of life — and all in the same boat, in a solar system being flooded with super-solar radiation. A scanty remnant of us, of all life from the two planets on which it has emerged, might creep underground and escape. But there would be no escaping the second and far greater peril.

But could there be a greater peril? Yes. Just one more is more terrible. It too comes from the Sun. The Sun is, in technical language, a Cepheid — that is, a pulsing star, one whose light and radiation — and, indeed, probably its bulk — varies, fluctuates on some mysterious atomic tide. These stars, which have been one of the first interests of astronomers since they were discovered (for one thing, they give a way of estimating the size of the Universe, when the distances are so vast that the usual way of measuring them — the parallax way — will no longer serve) — these pulsing stars have also, it is thought, another thing to tell us. They may tell us about the nature of atomic force. They are supposed to lessen and swell because, in the fabulous pressures that go on inside a sun, the compression gets so intense that at last all the electrons are stripped from the atom core. Then the atom somehow "rebounds," regathers the electrons of which it has been robbed and once again the star recovers its size. But what if it didn't?

There is, it is supposed, another end to the story, rare but not infrequent. Instead of just recovering, the star may explode. Novae, perhaps the most amazing phenomena of the whole night sky, seem to be stars that suddenly broke all their bounds. And the stars which are most likely to do that are

precisely Cepheids. Further, among Cepheids there seems to be one type of them which is most liable to explode. That is the type which is called, from its size and color, an Orange Dwarf. Now the serious matter lies precisely here. Our Sun is not only a Cepheid — this has been allowed for some time. But also there is no doubt it is an Orange Dwarf.

We had long faced up to the matter that our glorious Sun was not really much of a sun. It does well enough for us, but in the monstrous scale of the Universe, it does not rank at all high. But only lately did we realize that though modest to look upon, it stood high, dangerously high, in its possibilities. No one knows when a Cepheid will explode. It is one of the keenest hunts that is now going on in the night sky — to see if there is any way of recognizing a pre-nova, a star that is ready and ripe to burst. Does its spectrum show any shadows to forecast that blinding event? No one knows. What is suspected is that something quite hidden and perhaps catalytic may be the trigger that sets off this cosmic mine.

The sunspots may be warnings of indigestive trouble — as spots on our own face sometimes tell about our deep interior conflicts. If so, the storm signals have been flying doubly flagged at the masthead since we began to try and make earthspots with our bomb. Is it not possible that the Martians, who have so much to fear from Sun trouble, may have read these signs? Why shouldn't they — so far ahead of us and so anxious about sunlight — have watched and studied our common luminary and life-giver, and know its fever times and watch with anxiety its possible epileptic seizures. On that ground alone, on the ground that the spots have been so big of late, they might have assumed that some trouble was brewing. And knowing that the pull of the planets is at least one cause of the spot outbreak, they might (they should) have checked over the planets to see why their pull, their magnetic stresses, their ordinary atomic structure should have led to what is perhaps an unprecedented disturbance in the pivot of the whole system.

And then they would come to us. They would find the mischief lying at our door. Even if the sunspots had not raised the alarm, even if the Sun had not signaled in so unmistakable a way, they must have seen our fatal signal. When we twice struck Japan and then, not to slaughter but to astound, made the Pacific spout — when we time and again sent up great super-thunderheads of smoke, spray and the wreckage of human industry and human bodies, right up into the stratosphere — then we put out a finger to beckon attention on any watching fellow planet that we were the little fellow out for trouble and able and itching to give it. They could hardly have failed to see that defiant, wanton signal. With the Sun showing such major spots, with their knowledge of what those spots mean, with their knowledge of the dangerously delicately balanced nature of that furnace of force we call our day-bringer, they could not have failed to conclude that the time for action had come.

So we close for the moment the question "Why Now?" It is we who have decided why now anyone who cares for the solar system should look in on us and ask us to be careful. When a Cepheid explodes, it turns into a mass of flame which races out at a speed that in a few weeks has transformed it from a small insignificant star to one of the wonders of the sky. But only a wonder to someone fabulously far off. Near by — for any planetary body of such a sun — the display is a horror. In a matter of hours — during which the heat would rise to deadly heights — the flame itself would reach us and the Earth would probably be vaporized as it was engulfed. It would probably extend out as far as the orbit of Mars and though Mars might not be melted, all life upon it would vanish forever.

Then the star that has erupted shrinks again and soon becomes, in many cases, smaller than it has been. It seems that it often shrinks down till it becomes that strange dwarf-monster, a White Dwarf, fabulously heavy — some with a density that would make a square inch of the material weigh a ton — but emitting very little light-giving radiation. Even if any of the Sun's planets survived the terrible cataclysm, even if life on any of them could hide itself during this hurricane of super-flame, such life would only emerge out into a Universe so cold and black that death from zero would take that which had escaped death by incineration.

CHAPTER FIFTEEN

Where Now?

A STRANGE word to write when we are right in the middle of what seems a great, the greatest of, Third Acts. And yet what else can one say? We don't know from day to day whether we shall get a word more of news, however enigmatic. We don't know whether the visitors will give us any more; we don't know whether we shall be let receive it. New that our long smoldering lines of dispute have at one point broken into crackling flame, will not all general news be held up — on the chance that it might give news that ought to be kept under cover?

Still we need not close on a pessimistic note. For, as we have seen, after a lull in the U.S.A. sightings (or maybe simply a lull in the reporting of such sightings) it was from Korea that we had at the beginning of last year — on the nights on January 29th and 30th — the first of a swarm of new items. Two air squadrons, one on the Korean east coast and another in west central Korea, sighted flights of orange colored globes thought to be no more than three feet in diameter. On the same date (the 29th) a pilot flying north from Washington, D.C. reported to the Civil Aeronautics Authority that he had sighted a strange and excessively bright star that raced past his plane and lit up the cockpit. On March 13th the *Boston Traveller* carried a careful report from Dr. A. H. Baller. I have spoken with the doctor himself. A fine witness and a careful observer, he has a full account which he wrote immediately after the incident. Sitting in the train at Greenfield on February 20, he viewed three disks in ordered flight.

By April the sightings were not only numerous but one can pick out from them new features and important information. On the 18th Las Vegas reported a covey flying near the Nevada Atom Test Sight. Five men at the Nellis Air Force Base counted eighteen objects, estimating they were at 40,000 feet and cruising at 1,200 miles per hour. While, on the 21st, William Pugh, of the Cleveland Electrical Illumination Company, hearing a strange high pitched note sound three times, looked up and saw a saucer cruising overhead. Saucers are seldom heard, probably because they generally cruise too high — above 25,000 feet. Little sound comes down to us from that altitude. The note they make may also be supersonic. This sighting and "sounding" suggests that the note was near the upper limits of audibility. Mr. Pugh said it sounded like a bat's note, which we know is near the limits of human hearing. Cleveland also had another remarkable sighting made in mid-April by D. W. Radford, radio operator of Eastern Airlines. The remarkable thing about this disk was that it kept in sight for half an hour. It seemed to be moving slowly away across the sky. Late in the month, on the 29th, the Air Force permitted one of its officials to report that an unidentified object was sighted over Los Alamos. It was above the site for more than thirty minutes.

May carried the peculiarly convincing story of Navy Secretary Dan Kimball. His plane sighted a disk when he was flying to Guam. The Secretary told the story to officers and air cadets at Pensacola. His own pilot had come in and told him that a disk was near. He told the pilot to radio the plane that was following him astern. It replied, "We, too, have seen it." And May brought reports from Australia. Thirteen people in widely separated spots sent in accounts to Sidney about a huge tube that they had seen cruising at high speed. This type of craft was also reported from Tarbes in France on the 30th of June.

By July a saucer maximum was clearly being approached: sixteen given sightings were made in Chicago during the first week. From Berlin came the sworn statement of Oskar Linke, a fugitive mayor from East Germany who, near the town of Meinengen, saw a saucer on the ground. Then of course came the great outburst, culminating with the two big displays during the latter part of July over Washington itself. August had many sightings. And in September there were a number, though the press carried few. One of the best was given to me personally by Mr. Catlin of St. Louis. He and Mrs. Catlin were driving home from New York when close to the border of Pennsylvania they saw, with many other observers, a fleet of seven saucers cruising overhead and going onward to the west. On the 20th of September a saucer had been seen by official observers over the Baltic maneuvering area of the "eight nation fleet." This disk was seen to chase a Meteor jet fighter and then rush off into the sky. Finally, in December there was a fine sighting over the sea made by three observers from Santa Monica pier.

Of one thing we may then be certain; these phenomena continue. They are giving us fresh viewing, more variety, increase of good witnesses, and new detail on the cruising power and features of

design. If we go on making these observations and pooling our information we shall surely gain increasing knowledge.

As was said earlier, the conclusions that we reach will of necessity be according to what we think probable. But what has happened to our poor, standard, old-fashioned, common-sense notion of probability? Once "all sensible men," "all educated persons" thought much the same about certain basic things. They might vary as to detail but about the great map of things — here is the land of fact and there the ocean of surmise — they had no doubt.

But now the land has been inundated with surmise and out of the ocean stand up queer stubborn, enigmatic rocks of fact on which our traffic steamers of common sense get frightful bumps and some founder. If only we had a clear sensible explanation! But whichever explanation you take, you will have to stomach a painful amount of credulity. If you say, "It's all hallucination!" well then, hundreds of witnesses as sober, as cautious, and maybe many of them more informed than you, are just dolts and make fools of themselves for no purpose. If that is so, what am I to think of my own powers of observation? Are we all going mad and "seeing things"?

Say then, "It's a 'secret weapon,'" but do face up to what that involves — don't say it just because it sounds easy. It isn't. It means that responsible persons have misled the public. (Remember they never said, "No one anywhere in this world or outside is making flying disks" — they only said, "We are not.") It means also that by letting these vast new inventions stray about on the civilian flying air lanes, they have endangered the lives of those traveling in planes, risked the lives of harmless citizen-passengers who might be killed and killed horribly by being burnt to death. No: no considerate, responsible person, let alone a whole bunch of them, would dream of doing any such thing or taking any such risk. I know it — you know it — we all know it.

And yet... and yet... and yet... "Foreign powers" we may cling to as a man being pushed off a raft into the sea may cling to the smallest spar. We know it isn't true. Again they just couldn't afford, if they had such a grand slam weapon, to go and throw it away and risk losing the whole bag of secret tricks. The great enigmatic, iron-curtained or iron-masked country has plenty of space in which to try out secret weapons if it has them. To send them idly cruising over the United States is not toughness, it's not even brag — it's just insanity. If they intend war, what a relief to know they have gone off their heads and forgotten the first rules of war — secrecy and surprise!

So we must let the "spar" of "Foreign Powers" go. It won't hold the weight of argument from which we can't shake ourselves free, the weight of evidence that can't be dismissed. Where then can we find rest for our load? To what depth (of space) are we driven to sink?

Would to heaven there were some easier, nearer and at the same time less hackneyed, less romanticized place to rest than Mars! It is so ridiculous, and to use the now somewhat dated word, so "shy-making," to find that we have to take refuge on that H. G. Wells' hideout, that nest and breeding ground of the least respectable Science Fiction! But, as has been said, "Truth cares little for our dignity." Hence we so often try to suffocate that enfant terrible, that unwanted child of intelligence. It is that, more than dread, that I believe keeps us from considering seriously the Martian hypothesis.

There really does not seem much reason to fear that we shall be panicked by a Martian appearing. For what will he be like — as far as we can tell? In all probability a super-bee of perhaps two inches in length. As they have existed for so long on Mars, as it is presumed they now have no enemies — if they ever had — (as we know Natural Selection is a "negative force" and clips things back and reduces them to the plainest shapes) then these creatures of a world where intelligence has won total freedom from brutal repressive force, where life is free to be as beautiful as it cares — why, then, creatures as sensitive to color, as gifted with sight as bees, would be as beautiful as the most beautiful flower they have ever visited, as beautiful as any beetle, moth or butterfly. A creature with eyes like brilliant cut diamonds, with a head of sapphire, a thorax of emerald, an abdomen of ruby, wings like opal, legs like topaz — such a body would be worthy of this super-mind. I am sure that toward it our reaction would be: "What a diadem of living jewels!" It is we who would feel shabby and ashamed and maybe, with our clammy, putty-colored bodies, repulsive!

Of course, in spite of the beauty of insects, in spite of the fact that our somewhat bulging bodies, patchily covered with hair and for the rest mainly the tint of a toadstool, may not be that acme of esthetic charm we have presumed them to be, we must allow that we should find it hard to make friends with anything that had more than two legs and didn't stilt about as we do. The place — Mars — is bad enough. The product — insects — makes bad worse. Our intelligence might approve, our esthetic senses concede, but our "brute feelings" would shy, as a horse shies at a peacock. Of course it is all a matter of what our reaction might be to what till now has been treated as inconceivable. None of us can be sure of that. "He jests at scars who never felt a wound," says Shakespeare. People who have never been desperately bereaved write skits about widows. We know what has been the reception given to the statistically established evidence for Extra-sensory Perception by men who considered themselves not only highly educated but scientific, who maintained that they "sat down as a little child before Fact" (the phrase is of course that of T. H. Huxley).

The truth was (as was shown by Huxley himself when he was asked to examine some evidence that *Psychical Research* was bringing to light, and replied rudely — because, of course, of subconscious fear — that he would not even enquire) the truth was and is that the elasticity of our minds is not to be stretched indefinitely simply by the weight of evidence, the force of facts. We have an emotional tolerance as to what we can stand, and when that limit is reached we repress — no student of human nature, no examiner of his own conscience, needed Freud to tell him that. But so many scientists have never so enquired of themselves, have never examined the instrument — their particular mind-and-emotion complex — with which they have to try and grasp the world, with which they focus on and then try and understand "facts."

So we come back to the point made when we were discussing, earlier in this book, the way the evidence has come together and what we can make of it — what canons we have for establishing the meaning of the observations that have been made. There it was said, everyone in the end must be his own judge. One by one we shall make up our minds. Some may come to the most awkward but best-established conclusion gradually. Others may never be able to gain the freedom that would permit, in this extreme respect, an open mind. Probably the old will find it harder than the young. And as it is a personal question, then perhaps the final contribution that can be made here is for the reporter to put himself into the report as the last "exhibit" (as they say in evidence at a trial), the last fragment of evidence. The barrister may put himself in the witness box, the judge call on himself to testify.

As an average elderly man, the writer of these lines finds himself, when all the data is laid out and arranged, still divided. Not "of two minds." The mind has at last been driven to these conclusions. Step by step, for six years, it has been made to retreat to this uncomfortable and indeed scandalous spot. The force of the evidence would not let it halt short of this. It is one's feelings that refuse to follow. Stubbornly they remain earthbound. They seem to be incurably conventional. Their reaction (which seems immune to evidence) is the old, perpetually disproved cliché: "It never has happened before. It just can't have happened now."

Irrational, but all too natural. Anyone who is elderly today has seen enough things happen that all informed, all scientific opinion was certain could not happen. When Rontgen discovered X rays he said to his wife, not "How wonderful for the world: how amazed and happy my colleagues will be!" No. Knowing his world and his colleagues as actual persons, he remarked grimly, "Now there'll be the devil to pay!" Dewar, who made the first vacuum flasks — the Thermos — when his young men began to talk the New Physics, used to get angry, tell them to stop their fantasy and get back to facts. Haeckel, the intense champion of Evolution by Natural Selection, shouted in a conference with the new "Mendelians," "You are simply throwing back everything, back to Moses!"

Yes, we can see generation after generation — the wise, the authorities, the informed, the specialists, the men who are called and honored by the ambiguous but honorable name, the scientists — we see them telling each believing age (very willing to believe that they won't have to believe more than now is revealed) that all is now settled, that the canon is for all intents and purposes closed — we shall get endless additions to our present evidence for our present laws and experiences, but none that will turn

them upside down. And yet, generation after generation, the whole thing moves slowly turning right over. And today we have to own that, not only is this going on but it is going on no longer slowly — quite the reverse. We now turn over our fixed opinions — we are forced by facts — as quickly as a boat capsizes. It is wise then to be able to swim and not demand a boat of dogmas to carry us.

But, though the process has immensely accelerated in our generation, it has been going on for at least twenty-five centuries, to our certain knowledge. This kind of thing has not been sprung on us. Moreover, we have had plenty of time to notice our reaction to this sort of experience. We go through three phrases with a monotonous and rather discouraging regularity.

First, we say, "What rot, what mischievous nonsense! Such a fraud (the reporter of the fact we find detestable because indigestible) should be shut up. It is as dangerous as it is repulsively ridiculous!" Next we begin to joke about it: the thing, we own, has something of the lewdly funny about it, but of course it is really only a joke with which to tease and upset the pompous. Then one day, without anyone noting it, the whole thing has become obvious, banal, boring, a commonplace only noted to show how hopelessly backward, silly and prejudiced our elders were. The process is over for the time being. We have adjusted. But we have learnt nothing, nothing about ourselves. And when the next shock comes, the next breakthrough of unaccepted fact, we react once more in the same way.

The story for Occidental Man (the European that has spread till he has reached the Pacific) began in Asia Minor — the Turkey of today — perhaps somewhere about 600 B.C. And each step, we have to note, each step to let observation and evidence count, was fought — and often to the death — because it made men feel they were, at least physically, of less importance than they thought they were. We certainly have, as an unexamined assumption in all our minds, the conviction that we are immensely important, influential, significant, the most important and advanced thing in the entire Universe. The animals were put in the world for our use (though, as a wise vegetarian once said, "I have yet to receive the invoice"). The stars were placed in the sky to instruct each of us in advance as to how we may most profitably steer our course and make money. So when the Ionian Philosophers — the first empiricists, fact-finders and -lovers and free theorists, the first "scientists," men who wished to experiment, observe, analyze, trace — when these men on the coast of Asia Minor began to speculate, they were soon in trouble. For their speculations soon began to question the assumption of man's supreme importance and his kindred assumption that the world was made and run by beings almost exactly like men ("men writ large" and "all too human").

When Anaxagoras (born about 500 B.C.) began to suggest that the Sun was not the body of a living God but "a mass of molten metal about the size of the Peloponnese" (the small peninsula with which Greece terminates), he was bitterly attacked, tried for blasphemy — a conviction would have meant death — got off by the special pleading of his friend Pericles, but had to fly the city — the city of Athens to which he had gone to live because it was the center of Greek culture and open enquiry!

When free enquiry started again, after the Greek collapse, with the Renaissance, when the Polish Bishop Kopernick began to speculate again about the night sky and how the stars really ran and our Earth's relation to them, his friends dared to publish his book only after his death. He was cautious even in his actual expressions and for a little while it seemed that the whole thing might be regarded as a specialists' dispute, a stupid piece of expert argument and of no concern to sensible men. But soon our insane suspicion that our self-importance might be in question awoke and there was, in the usual name of theology, the devil to pay.

Giordano Bruno, a rash man believing that "facts" could speak and should be spoken of, defied authority in its own lair, and to the shame of all concerned, to the lasting discredit of their judgment and their charity, was burnt alive.

Galileo's story — which follows historically on Bruno's — is even better known. Discovering more facts about the stars and planets, he got into equally hot water but escaped the actual torture and the flame by "recanting." What is not so well known is that Galileo's own mind was anything but a free one, open to all the evidence. For when he was studying that anomalous planet, Saturn, he had only a small telescope and naturally did not discover the rings — with which he might have been content as they did

not disturb his prejudices, his assumptions. What he did see was what everyone using a small telescope does see when he looks at Solar Planet Number 6. There is a bright body and on each side of it can be seen (at least generally) two less bright bodies, almost like wings on an insect. Then if you watch night after night, one night the wings, the two side bodies, are gone. We now know why. As mentioned above, the disk of the rings is so thin that only a very big modern telescope will show that rim when it is end on to the earth.

But Galileo did not know this. And he could not think what had happened. And while he was in suspense there rushed into his mind the old, superstitious story about the god Saturn. Had he stumbled on evidence that would confirm and not challenge ancient tradition? This was just too bad. No more than T. H. Huxley was he "prepared to sit down humbly as a little child before Fact," if fact chose to be disloyal, change sides and instead of properly vexing bishops, support them and vex scientists! Galileo wrote in his diary with indignant wonder, "Does then Saturn indeed" (as the tradition had said) "eat his own children?" Could it be that the hateful, tyrannous, anthropomorphic stick-in-the-muds had after all known more about the stars than he, the great revolutionary pioneer? The question was too painful. It was impossible. But what if it was true? To ask question was of course to be bound to follow it up — to soidy and study again, observe and observe. To ask the question was right enough and, though painful enough, it was less painful than going on to see whether after all the old had not been wholly wrong. Galileo asked it and then his nerve failed, his courage gave out, he did not go on and make the further observations — observations that must in the end, as it did with later enquirers, lead to the wonderful, and in its way reassuring, discovery of the rings. No, he couldn't face the risk. We know that he never studied Saturn again.

There are facts too awkward for us to accept even when we are great pioneer scientists. We fear the results to us personally, to our prestige and our prejudices. The Earth, however, with man on it, had been put in its place — Planet Number 3 and one of the small ones of a sun (a later addition to our "demoting") that is only an Orange Dwarf. But till this generation we hung on to two concepts of our uniqueness, the uniqueness of our station in space and of our place in the whole hierarchy of life. The Earth, we said, is the only planet with life and the solar system the only system with planets. So we are the only life in the Universe — minute but unique, and making up for lack of quantity, for our lack of size, by the intensity of our quality, our rarity. Evolution might show that we were sprung from some animal stock but we alone had reached the top, come out on the platform of intelligence and self-conscious understanding, able to see things steadily and see them whole!

And then at the two ends of our argument we were attacked and both flanks have given way. Hundreds of thousands of suns are now said to have planets. That gives away our uniqueness. Further, right up against us in the solar system, our companion Mars has life and there is no reason to suppose that it is not in advance of us. While right beside our actual homes — in every beehive — there are intelligences — insects that can think, plan, make maps, give bearings, exchange information. They are apparently conscious and they are not even mammals, warm-blooded, big-brained — they are insects. And the life that is on Mars has probably taken to insect form to raise itself to a pinnacle of understanding above our highest reach today.

Our pride is in ruins. But need we feel that life is emptied of significance? Surely, unless we are insane egotists, the opposite is the truth. We have lost our paranoiac loneliness and dream of utter superiority. But we have found companions — yes, and possible guides — minds that have gone ahead of ours. Is not this "good news" of the highest quality and of the utmost aptness? Shall we reject the possibility out of hand? Are we doing so well on our own? Have we, with our new powers and trust "in man alone," have we done so well? Having conquered all the other species (or at least made them shun us) have we, Homo self-styled Sapiens, settled down to peace, prosperity and progress? Look at the map, look at the news.

One of our shrewdest observers did indeed remark — even before our present extravagances of uncontrolled violence against one another — "It is doubtful in what form, were they given to such reflections, the 'lower creation,' the animals, would conceive of the Supreme Principle of Good. There can,

alas, be no doubt of the form in which they would imagine the Principle of Evil — as a white man." And now a scientific white man means the same principle of exterminating, pitiless destruction not only for other species but for our own, for ourselves and our children.

There seems then, here and now, no right feeling (any more than right and adequate reason) why we should refuse, with either heart or mind, the present possibility that hangs over us. It may be an offer. If so, it could not be more apposite. Why should we refuse at least to consider it?

Will readers send in any sightings to the Civilian Saucer Investigation Committee, Box 1971, Main Post Office, Los Angeles 53, California. These reports, if it is desired, will be kept confidential.