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TAKEOFF

By Cyril M. Kornbluth

NEW WORLDS
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Part One

I.

Morning of a bureaucrat.

On the wall behind his desk Daniel Holland, general manager of the U.S. Atomic Energy Commission, had hung the following:

His diploma from Harvard Law, '39;

A photograph of himself shaking hands with his hero, the late David Lilienthal, first A.E.C. chairman;

His certificate of honorable active service in the Army of the United States as a first lieutenant, in the Judge Advocate General's Department, dated February 12, 1945;

A letter of commendation from the general counsel of the T.V.A., which included best wishes for his former assistant's success in the new and challenging field of public administration he was entering;

A diploma declaring in Latin that he was an honorary Doctor of Laws of the University of North Carolina as of June 15, 1956; A blowup of *The New Republic's* vitriolic paragraph on his "Bureaucracy versus the People" (New York, 1956);

A blowup of *Time* magazine's vitriolic paragraph on his "Red Tape Empires" (New York, 1957);

Signed photographs of heroes (Lilienthal, the late Senator McMahon); industrialists (Henry Kaiser, the late Charles E. Wilson of General Motors, Wilson Stuart of Western Aircraft, the late John B. Watson of International Business Machines); scientists (James B. Conant, J. Robert Oppenheimer); and politicians (Chief Justice Palmer, Senator John Marshall Butler of Maryland, ex-President Truman, ex-President Warren, President Douglas);

An extract from the January 27, 1947, hearings of the Senate half of the joint Senate-House Committee on Atomic Energy—held in connection with confirmation of the President's appointees to the A.E.C., particularly that of Lilienthal—which ran as follows:

In many countries of the world there are Interplanetary or Rocket Societies whose members, fired with Man's age-old dream of space flight, can do little more than plan on paper the vital statistics necessary for the first flight to the Moon. This story, second in last year's International Fantasy Award, tells of one such Society suddenly endowed with unlimited capital.

Senator McKellar (to Mr. Lilienthal): *Did it not seem to you to be remarkable that in connection with experiments that have been carried on since the days of Alexander the Great, when he had his Macedonian scientists trying to split the atom, the President of the United States would discharge General Groves, the discoverer of the greatest secret that the world has ever known, the greatest discovery, scientific discovery, that has ever been made, to turn the whole matter over to you: who never really knew, except from what you saw in the newspapers, that the Government was even thinking about atomic energy?*

The Chairman: *Let us have it quiet please.*

Senator McKellar: *You are willing to admit, are you, that this secret, or the first history of it, dated from the time when Alexander the Great had his Macedonian scientists trying to make this discovery, and then Lucretius wrote a poem about it, about two thousand years ago? And everybody has been trying to discover it, or most scientists have been trying to discuss it, ever since. And do you not really think that General Groves, for having discovered it, is entitled to some little credit for it?*

"Read that," said Holland to his first caller of the morning. "Go on, read it."

James MacIlheny, Los Angeles insurance man and president of the American Society for Space Flight, gave him an inquiring look and slowly read the extract.

"I suppose," MacIlheny said at last, "your point is that you wouldn't be able to justify granting my request if Congress called you to account."

"Exactly. I'm a lawyer myself; I know how they think. Right-wrong, black-white, convicted-acquitted. Exactly why should A.E.C. 'co-operate and exchange information with' you people? If you're any good, we ought to hire you. If you aren't any good, we oughtn't to waste time on you."

"Are those your personal views, Mr. Holland?" asked MacIlheny, flushing.

Holland sighed. "My personal views are on the record in a couple of out-of-print books, a few magazine articles, and far too many congressional-hearing minutes. You didn't come here to discuss my personal views; you came for an answer to a question. The answer has got to be 'no'".

"I came on your invitation——" MacIlheny began angrily, and then he pulled himself together. "I'm not going to waste time losing my temper. I just want you to consider some facts. American Government rocket research is scattered all over hell——Army, Navy, Air Force, Bureau of Standards, Coast and Geodetic Survey, and God-alone-knows-where-else. You gentlemen don't let much news out, but obviously we're getting nowhere. We would have had a manned rocket on the moon ten years ago if we were! I'm speaking for some people who know the problem, a lot of them trained, technical men. We've got the drawings. We've had some of them for fifteen years! All that's needed is money and fuel, atomic fuel——"

Holland looked at his watch, and MacIlheny stopped in mid-flight. "I see it's not getting through," he said bitterly. "When the Russian or Argentine lunar guided missiles begin to fall on America you'll have a lot to be proud of, Mr. Holland." He started for the door. Before he was out, Holland's secretary was in, summoned by a buzzer.

"Let's hit the mail, Charlie," Holland said, lighting a cigarette and emptying his overflowing "in" basket on his desk.

Ryan's bid on the Missoula construction job. "Tell him very firmly that I want him to get the contract because of his experience, but that his bid's ridiculously high. Scare him a little."

Damages claim from an ex-A.E.C. employee's lawyer, alleging loss of virility from radiation exposure. "Tell Morton to write this shyster absolutely nothing doing; it's utterly ridiculous. Hint that we'll have him up before his state bar association if he pesters us any more. And follow through if he does!"

Dr. Mornay at Oak Ridge still wanted to publish his article arguing for employment of foreign-born scientific personnel in the A.E.C. "Write him a very nice letter. Say I've seriously considered his arguments but I still think publication would be a grave error on his part. See my previous letter for reasons and ask him just to consider what Senator Hoyt would make of his attitude."

The governor of Nevada wanted him to speak at a dam dedication. "Tell him no, I never speak, sorry."

Personnel report from Missoula Directed Ops. "Greenleaf's lost three more good men, damn it. Acknowledge his letter of transmittal—warm personal regards. And tell Weiss to look over the table of organization for a spot we can switch him to where he'll stay in grade but won't be a boss-man."

Half-year fiscal estimate from Holloway at Chalk River Liaison Group in Canada. "Acknowledge it but don't say yes or no. Make copies for Budget and Comptroller. Tell Weiss to ride them for an opinion but not to give them any idea whether I think it's high, low, or perfect. I want to know what *they* think by tomorrow afternoon."

Messenger query from the A.P. on Hoyt's speech in the Senate. "Tell them I haven't seen the text yet and haven't had a chance to check A.E.C. medical records against the Senator's allegations. Add that in my personal experience I've never met an alcoholic scientist and until I do I'll continue to doubt that there is any such animal. Put some jokes in it."

The retiring Regional Security and Intelligence Office agent in charge at Los Angeles wanted to know Holland's views on who should succeed him. Records of three senior agents attached. "Tell him Anheier looks like the best bet."

The Iranian ambassador, with an air of injured innocence, wanted to know why his country's exchange students had been barred even from nonrestricted A.E.C. facilities. "Tell him it was a State Department decision. Put in some kind of a dig so he'll know I know they started it with our kids. Clear it with State before I see it."

A rambling petition from the Reverend Oliver Townsend Warner, Omaha spellbinder. "I can't make head or tail of this. Tell Weiss to answer it some way or other. I don't want to see any more stuff from Warner; he may have a following but the man's a crank."

Recruiting programme report from Personnel Office. "Acknowledge this and tell them I'm not happy about it. Tell them I want on my desk next Monday morning some constructive ideas about roping better junior personnel in, and keeping them with us. Tell them it's perfectly plain that we're getting the third-rate graduates of the third-rate schools and it's got to stop."

Letter from Regional Security and Intelligence officer at Chicago; the F.B.I. had turned over a derogatory information against Dr. Oslonski, mathematical physicist. "Hell. Write Oslonski a personal letter and tell him I'm sorry but he's going to be suspended from duty and barred from the grounds again. Tell him we'll get his clearance over within the minimum possible time and I know it's a lot of foolishness but policy is policy and we've got to think of the papers and Congress. Ask him please to consider the letter a very private communication. And process the S. and I. advisory."

A North Dakota senator wanted a job for his daughter, who had just graduated from Bennington. "Tell Morton to write him that Organization and Personnel hires, not the general manager."

Dr. Redford at Los Alamos wanted to resign; he said he felt he was getting nowhere. "Ask him please, as a personal favor to me, to delay action on his resignation until I've been able to have a talk with him. Put in something about our acute shortage of first-line men. And teletype the director there to rush-reply a report on the trouble."

A red-bordered, courier-transmitted letter from the Secretary of the Department of the Interior, stamped *Secret*. He wanted to know when he would be able to figure on results from A.E.C.'s A.D.M.P.—Atomic Demolition Material Programme—in connection with planning for Sierra Reclamation Project. "Tell Interior we haven't got a thing for him and haven't got a date. The feeling among the A.D.M.P. boys is that they've been off on a blind alley for the past year and ought to resurvey their approach to the problem. I'm giving them another month because Scientific Advisory claims the theory is sound. That's secret, by courier."

Hanford's quarterly omnibus report. "Acknowledge it and give it to Weiss to brief for me."

Messenger query from the Bennet newspapers; what about a rumour from Los Angeles that the A.E.C. had launched a great and costly programme for a space-rocket atomic fuel. "Tell them A.E.C. did not, does not, and probably will not contemplate a space-rocket fuel programme. Say I think I know where the rumour started and that it's absolutely without foundation, impossible to launch such a programme without diverting needed weaponeering personnel, etcetera."

Field Investigations wanted to know whether they should tell the Attorney General about a trucking line they caught swindling the A.E.C. "Tell them I don't want prosecution except as a last resort. I do want restitution of the grafted

dough, I want the Blue Streak board of directors to fire the president and his damn cousin in the dispatcher's office, and most of all I want Field Investigations to keep these things from happening instead of catching them *after* they happen."

And so on.

MacIlheny went disconsolately to his room at the Willard and packed. They wouldn't start charging him for another day until 3.00 p.m.: he opened his portable and began tapping out his overdue "President's Message" for *Starward*, monthly bulletin of the American Society for Space Flight. It flowed more easily than usual. MacIlheny was sore.

Fellow Members:

I am writing this shortly after being given a verbal spanking by a high muckamuck of the A.E.C. I was told in effect to pick up my marbles and not to bother the older boys: the Government isn't interested in us bumbling amateurs. I can't say I enjoyed this after my hopes had been raised by the exchange of several letters and an invitation to see Mr. Holland about it "the next time I was in Washington." I suppose I mistook routine for genuine interest. But I've learned something out of this disheartening experience.

It's this: we've been wasting a lot of time in the A.S.F.S.F. by romancing about how the Government would some day automatically take cognizance of our sincere and persistent work. My experience today duplicates what happened in 1946, when our campaign for the Government to release unnecessarily classified rocketry art was the flop of the year.

You all know where we stand. Twenty years of theoretical work and math have taken us as far as we can go alone. We now need somebody else's money and somebody else's fuel. A lot of people have money, but under existing circumstances only the A.E.C. can have or ever be likely to have atomic fuel.

The way I feel about it, our next step is fund-raising—lots of it—hat-in-hand begging at the doors of industrial firms and scientific foundations. With that money we can go on from the drawing board to practical experimental work on bits and pieces of space ship, lab-testing our drawing-board gadgets until we know they work and can prove it to anybody—even an A.E.C. general manager.

When we have worked the bugs out of our jato firing circuits, our deadlight gaskets, our manhole seals, our acceleration couches, and the hundred-and-one accessories of space flight, we'll be in a new position. We will be able to go to the A.E.C. and tell them: "Here's a space ship. Give us fuel for it. If you don't, we'll hold you up to the scorn and anger of the country you are blindly refusing to defend."

*James MacIlheny
President, A.S.F.S.F.*

MacIlheny sat back, breathing hard and feeling more composed. There was no point to hating Holland, but it had been tragic to find him, a key man, afraid of anything new and even afraid to admit it, hiding behind Congress.

He still had some time to kill. He took from his brief case a report by the A.S.F.S.F. Orbit Computation Committee (two brilliant youngsters from Cal Tech, a Laguna Beach matron to punch the calculating machine and a flow-analysis engineer from Hughes Aircraft) entitled "Refined Calculations of Grazing Ellipse Braking Trajectories for a Mars Landing After a Flight Near Opposition." Dutifully he tried to read, but at the bottom of its first mimeographed page the report ran into the calculus of variations. MacIlheny knew no mathematics; he was no scientist and he did not pretend to be one. He was a rocket crank, he knew it, and it was twisting his life.

He threw himself into a chair and thought bitterly of the United States moon base that should have been established ten years ago, that should be growing now with the arrival of every monthly rocket. He knew it by heart; the observatory where telescopes—of moderate size, but unhampered by Earth's dense and shimmering atmosphere—would solve new stellar mysteries every day; the electronics lab where space-suited engineers would combine and recombine vacuum-tube elements with all outdoors for their vacuum tube; the hydroponics tanks growing green stuff for air and food, fed exhaled carbon dioxide and animal waste, producing oxygen and animal food under the raw sunlight on the Moon.

And he could see a most important area dotted with launchers for small, unmanned rockets with fission-bomb war heads, ready to smash any nation that hit the United States first.

He could see it; why not they? The scattered, unco-ordinated, conservative rocketry since World War II had produced what?

Army guided missiles, roaring across arcs of the Pacific every now and then on practice runs.

Air Force altitude jobs squirting up on liquid fuel from the deserts of the Southwest. There was a great, strange, powder-blue city of half a million souls at White Sands, New Mexico, where colonels spoke only to generals and generals spoke only to God. They were "working on" the space-flight problem; they were "getting out the bugs."

The Coast and Geodetic Survey firing its mapping rockets up and over, up and over, eternally, coast to coast, taking strips and strips of pictures.

The Bureau of Standards shooting up its cosmic-ray research rockets; for ten years they "had been developing" a space-suit for walking on the Moon. (There were space-suit drawings in the A.S.F.S.F. files—had been for fifteen years.)

The Navy had its rockets too. You could fire them from submarines, destroyers, cruisers, and special rocket-launching battlewagons that cost maybe sixty-odd what a space ship would stand you.

MacIlheny glumly told himself: might as well get to the airport. No point hanging around here.

He checked out, carrying his light overnight bag and portable. An inconspicuous man followed him to the airport; he had been following MacIlheny for weeks. They both enjoyed the walk; it was a coldly sun-bright January day.

II.

There was an immense documentation on Michael Novak, but it was no more extensive than the paper work on any other A.E.C. employee. For everyone—from scrubwoman to Nobel-prize physicist—the A.E.C. had one; so-and-so was eighty-seven years old and dribbled when he ate. Their backgrounds were checked to the times of their birth (it had once been suggested, in effect, that their backgrounds be checked to nine months before their birth—this by a congressman who thought illegitimacy should be sufficient reason for denying an applicant employment by the A.E.C.).

The Security and Intelligence Office files could tell you that Michael Novak had been born in New York City, but not that he had played tag under and around the pillars of the Canarsie Line elevated shortly before it was torn down. They could tell you that his mother and father had died when he was sixteen, but not that he had loved them. They could tell you that he had begun a brilliant record of scholarship-grabbing in high school, but not that he grabbed out of loneliness and fear.

Rensselaer Polytechnic Institute: aeronautical engineering (but he had been afraid to fly; heights were terrifying) and a junior-year switch to ceramic engineering, inexplicable to the A.E.C. years later.

A ten-month affair with a leggy, tough, young sophomore from the Troy Day College for Women. They interviewed her after ten years as a plump and proper Scarsdale matron; she told the Security men yes, their information was correct; and no, Michael had shown no signs of sexual abnormality.

Summer jobs at Corning Glass and Elpico Pottery, Steubenville, Ohio (but not endless tension: will they do what I tell them, or laugh in my face? Are they laughing at me now? Is that laughter I hear?). Ten years later they told the Security men sure I remember him, he was a good kid; no, he never talked radical or stuff like that; he worked like hell and he never said much (and maybe I better not tell this guy about the time the kid beat the ears off Wyrostek when he put the white lead in the kid's coverall pocket).

Scholarship graduate study at the University of Illinois, the Hopkins Prize Essay in Ceramic Engineering (with at first much envy of the scatterbrained kids who coasted four years to a B.A., later thin disgust, and last a half-hearted acceptance of things as they were).

The teaching fellowship. The doctoral dissertation on "Fabrication of Tubular Forms from Boron-Based High-Tensile Refractory Pastes by Extrusion." Publication of excerpts from this in the *Journal* of the Society of Ceramic Engineers

brought him his bid from the A.E.C. They needed his speciality in N.E.P.A.—Nuclear Energy for the Propulsion of Aircraft.

He had taken it, his records showed, but they did not show the dream world he had thought N.E.P.A. would be, or the dismaying reality it was.

N.E.P.A. turned out to be one hour in the lab and three hours at the desk; bending the knee to seniors and being looked at oddly if you didn't demand that juniors bend the knee to you. It was wangling the high-temperature furnace for your tests and then finding that you'd been bumped out of your allotted time by a section chief or a group director riding a hobby. It was ordering twenty pounds of chemically pure boron and getting fifty-three pounds of commercial grade. It was, too often, getting ahead on an intricate problem and then learning by accident that it had been solved last year by somebody else in some other division. It was trying to search the records before starting your next job and being told that you weren't eligible to see classified material higher than *Confidential*. It was stamping your own results *Restricted* or at most *Confidential* and being told that it was safer, all things considered, to stamp them *Secret* and stay out of trouble.

It was being treated like a spy.

It was, in spite of all this, a chance to work a little at new and exciting problems.

And then, his records showed, in August of his second year, he had been transferred to Argonne National Laboratory, Chicago, as N.E.P.A. Refractories Group Liaison with Neutron Path Prediction Division of the Mathematical Physics Section. The records did not say why a ceramic engineer specializing in high-tensile refractories and with a smattering of aircraft background had been assigned to work in an immensely abstruse field of pure nuclear theory for which he had not the slightest preparation or aptitude.

From August to mid-December, the records said, he bombarded the office of Dr. Hurlbut, director of Argonne Lab, with queries, petitions, and requests for a rectification of his absurd assignment, but the records showed no answers. Finally, the records showed that he resigned from A.E.C. without prior notice—forefeiting all salaries and allowances due or to become due—on a certain day toward the end of the year.

This is what happened on that day.

Novak stopped in the cafeteria downstairs for a second cup of coffee before beginning another baffling day at Neutron Path Prediction—a day he hoped would be his last if Hurlbut had looked into the situation.

"Hi, there," he said to a youngster from Reactor Design. The boy mumbled something and walked past Novak's table to one in the corner.

Oh, fine. Now he was a leper just because he was the victim of some administrative foolishness. It occurred to him that perhaps he had become a bore about his troubles and people didn't want to hear any more about them. Well, he was sick of the mess himself.

A girl computer walked past with coffee and a piece of fudge cake. "Hi, there," he said, with less confidence. She had always been good for a big smile, but this time she really gave out.

"Oh, Dr. Novak," she gulped, "I think it's just *rotten*."

What was this—a gag? "Well, I hope to get it fixed up soon, Grace."

She sat down. "You're filing a grievance? You certainly ought to. A man in your position——"

"*Grievance*? Why, no! I actually saw Hurlbut yesterday, and I just grabbed him in the corridor and told him my troubles. I said that evidently my memos weren't getting through to him. He was very pleasant about it and he said he'd take immediate action."

She looked at him with pity in her eyes and said: "Excuse me." She picked up her tray and fled.

The kid was kidding—or nuts. Hurlbut would straighten things out. He was a notorious scientist-on-the-make, always flying all over the map for speaking dates at small, important gatherings of big people. You saw him often on the front pages and seldom in the laboratory, but he got his paper work cleaned up each month.

Novak finished his coffee and climbed the stairs to the Mathematical Physics Section. He automatically checked the bulletin board in passing and was brought up short by his own name.

FROM THE OFFICE OF THE DIRECTOR

To: Dr. Michael Novak (NPPD) Re: Requested Transfer

Your request is denied. The Director wishes to call your attention to your poor record of production even on the routine tasks it was thought best you be assigned to.

The Director suggests that a more co-operative attitude, harder work, and less griping will get you further than your recent attempts at office intrigue and buttonholing of busy senior officers.

"The man's crazy," somebody said at his shoulder. "You have a perfect grievance case to take to the——"

Novak ignored him. He ripped the memo from the board and walked unsteadily from the bare white corridors of the Mathematical Physics Section, through endless halls, and into the Administrative Division—carpets, beige walls, mahogany, business suits, pretty secretaries in pretty dresses walking briskly through these wonders.

He pushed open a mahogany door, and a receptionist stopped doing her nails to say: "Who shall I say is—hey! You can't go in there!"

In the carpeted office beyond, a secretary said: "What's this? What do you want?" He pushed on through the door that said: *Dr. Hurlbut's Secretary*.

Dr. Hurlbut's secretary wore a business suit that fitted like a bathing suit, and she said: "Oops! You weren't announced; you startled me. Wait a minute; Dr. Hurlbut is engaged——"

Novak walked right past her into the director's mahogany-furnished oak-paneled office while she fluttered behind him. Hurlbut, looking like the official pictures of himself, was sitting behind half an acre of desk. A man with him gaped like a fish as Novak burst in.

Novak slapped the memo on his desk and asked: "*Did you write this?*"

The director, impeccably clothed, barbered, and manicured, rose looking faintly amused. He read the notice and said: "You're Novak, aren't you? Yes, I wrote it. And I had it posted instead of slipping it into your box because I thought it would have a favourable effect on morale in general. Some of the section chiefs have been getting sadly lax. No doubt you were wondering."

He had been warned by the "personality card" that accompanied Novak on his transfer to expect such piffling outbursts. However, the man worked like the devil if you just slapped him down and kept hectoring him. One of those essentially guilt-ridden types, the director thought complacently. So pitifully few of us are smooth-running, well-oiled, efficient machines ...

"Here's my resignation," said Novak. He gave his resignation to Hurlbut on the point of the jaw. The Director turned up the whites of his eyes before he hit the grey broadloom carpeting of his office, and the man with him gaped more fishily than ever. The secretary shrieked, and Novak walked out, rubbing the split skin on his knuckles. It was the first moment of pure satisfaction he had enjoyed since they took him off refractories at N.E.P.A.

Nobody pulled the alarm. It wasn't the kind of thing Hurlbut would want on the front pages. Novak walked, whistling and unmolested across the lawn in front of Administration to the main gate. He unpinned his badge and gave it to a guard, saying cheerfully: "I won't be back."

"Somebody leave you a fortune?" the guard kidded.

"Uh, no," said Novak, and the mood of pure satisfaction suddenly evaporated. Nobody had left him a fortune, and he had just put a large, indelible blot on his career.

The first thing he did when he got back to his hotel was phone a situation-wanted ad to *Ceramic Industries*. Luckily he caught the magazine as it was closing its forms on classifieds; subscribers would have his ad in ten days.

III.

They were ten bad days.

The local employment agencies had some openings for him, but only one was any good and he was turned down at the interview. It was a scientific supply house that needed a man to take over the crucibles and refractories department; it involved research. The president regretfully explained that they were looking for somebody a little more mature, a little more experienced in handling men, somebody who could take orders——

Novak was sure the crack meant that he knew about his informal resignation from A.E.C. and disapproved heartily.

All the other offers were lousy little jobs; mixing and testing batches in run-down Ohio potteries, with pay to match and research opportunities zero.

Novak went to cheap cinemas and ate in cheap cafeterias until the answers to his ad started coming in. A spark-plug company in Newark made the best offer in the first batch; the rest were terrible. One desperate owner of a near-bankrupt East Liverpool pottery offered to take him on as full partner in lieu of salary. "I feel certain that with a technical man as well qualified as yourself virtually in charge of production and with me handling design and sales we would weather our present crisis and that the ultimate rewards will be rich. Trusting you will give this proposal your serious——"

Novak held off wiring the Newark outfit to see what the next day would bring. It brought more low-grade offers and a curious letter from Los Angeles.

The letterhead was just an office number and an address. The writer, J. Friml, very formally offered Dr. Novak interesting full-time work in refractories research and development connected with very high-altitude jet aircraft. Adequate laboratory facilities would be made available, as well as trained assistance if required. The salary specified in his advertisement was satisfactory. If the proposition aroused Dr. Novak's interest, would he please wire collect and a telegraphed money order sufficient to cover round-trip expenses to Los Angeles would be forthcoming.

One of the big, coast aircraft outfits? It couldn't be anything else, but why secrecy? The letter was an intriguing trap, with the promised money order for bait. Maybe they wouldn't want him after all, but there was nothing wrong with a free trip to Los Angeles to see what they were up to. That is, if they really sent the money.

He wired J. Friml, collect, at the address on the letterhead:

Interested your offer but appreciate further details if possible.

The next morning a more-than-ample money order was slipped under his door, with the accompanying message:

Full details forthcoming at interview; please call on us at your convenience wiring in advance. Our office open daily except Sunday nine five. J. Friml, Secretary Treasurer.

Of what?

Novak laughed at the way he was being openly hooked by curiosity and a small cash bribe, and phoned for an airline reservation.

He left his bag at the Los Angeles airport and showered in a pay booth. He had wired that he would appear that morning. Novak gave the address to a cabby and asked: "What part of town's that?"

"Well," said the cabby, "I'll tell you. It's kind of an old-fashioned part of town. Nothing's *wrong* with it."

"Old-fashioned" turned out to be a euphemism for "run-down." They stopped at a very dirty eight-storey corner office building with one elevator. The lobby was paved with cracked octagonal tile. The lobby directory of tenants was enormous. It listed upwards of two hundred tenant firms in the building, quadrupled and quintupled up in its fifty-odd offices. Under f Novak found J. Friml, Room 714.

"Seven," he bleakly told the unshaved elevator man. Whatever was upstairs, it wasn't a big, coast plane factory.

Room 712 stopped him dead in the corridor with the audacity of the lettering on its glass door. It claimed to house the Arlington National Cemetery Association, the Lakeside Realty Corporation, the Western Equitable Insurance Agency, the California Veterans League, Farm and Home Publications, and the Kut-Rite Metal Novelties Company in one small office.

But at Room 714 his heart sank like a stone. The lettering said modestly: *American Society for Space Flight*.

I might have known, he thought glumly. Southern California! He braced himself to enter. They would be crackpots, the lab would be somebody's garage, they would try to meet their pay roll by selling building lots on Jupiter ... but they were paying for his time this morning. He went in.

"Dr. Novak?" said a young man. Nod. "I'm Friml. This is Mr. MacIlheny, president of our organization." MacIlheny was a rawboned middle-aged man with a determined look. Friml was sharp-faced, eye-glassed, very neat and cold.

"I'm afraid you might think you were brought here under false pretences, Doctor," said MacIlheny, as if daring him to admit it.

Friml said: "Sit down." And Novak did, and looked around. The place was clean and small with three good desks, a wall banked with good files—including big, shallow blue-print files—and no decorations.

"I asked for research and development work," Novak said cautiously. "You were within your rights replying to my ad if you've got some for me."

MacIlheny cracked his knuckles and said abruptly: "The anonymous offer was my idea. I was afraid you'd dismiss us as a joke. We don't get a very good press."

"Suppose you tell me what you're all about." It was their money he was here on.

"The A.S.F.S.F. is about twenty years old, if you count a predecessor society that was a little on the juvenile side. They 'experimented' with powder rockets and never got anywhere, of course. They just wanted to hear things go bang.

"An older element got in later—engineers from the aircraft plants, science students from Cal Tech and all the other schools—and reorganized the Society. We had a tremendous boom, of course, after the war—the V-2's and the atom bomb. Membership shot up to five thousand around the country. It dropped in a couple of years to fifteen hundred or so, and that's where we stand now."

Friml consulted a card: "One thousand, four hundred, and seventy-eight."

"Thanks. I've been president for ten years, even though I'm not a technical man, just an insurance agent. But they keep re-electing me so I guess everybody's happy.

"What we've been doing is research on paper. Haven't had the money for anything else until recently. Last January I went to Washington to see the A.E.C. about backing, but it was no dice. With the approval of the membership I went the rounds of the industrial firms looking for contributions. Some foresighted outfits came through very handsomely and we were able to go to work.

"There was a big debate about whether we should proceed on a 'bits-and-pieces' basis or whether we should shoot the works on a full-scale steel mock-up of a moon ship. The mock-up won, and we've made very satisfactory progress since. We've rented a few acres in the desert south of Barstow and put up shops and——" He couldn't keep the pride out of his voice. He opened his desk drawer and passed Novak an eight-by-ten glossy print. "Here."

He studied it carefully: a glamour photograph of a gleaming, massive, bomb-shaped thing standing on its tail in the desert with prefab huts in the background. It was six times taller than a man who stood beside it, leaning with a studied air against a delta-shaped fin. That was a lot of metal—a *lot* of metal, Novak thought with rising excitement. If the picture wasn't a fake, they had money and the thing made a little more sense.

"Very impressive," he said, returning the picture. "What would my job be?"

"Our engineer in charge, Mr. Clifton, is a remarkable man—you'll like him—but he doesn't know refractories. It seems to be all he doesn't know! And our plans include a ceramic exhaust throat liner and an internal steering vane. We have the shapes, theoretically calculated, but the material has to be developed and the pieces fabricated."

"Internal steering vane. Like the graphite vanes in the various German bombardment rockets?"

"Yes, with some refinements," MacIlheny said. "It's got to be that way, though I don't envy you the job of developing a material that will take the heat and mechanical shock. Side-steering rockets would be much simpler, wouldn't they? But the practical complications you run into—each separate steering jet means a separate electrical system, a separate fuel pump, perforating structural members and losing strength, adding weight without a corresponding thrust gain."

"You said you weren't a technical man?" asked Novak.

MacIlheny said impatiently: "Far from it. But I've been in this thing heart and soul for a long time and I've picked up some stuff." He hesitated. "Dr. Novak, do you have a thick hide?"

"I suppose so."

"You'll need it if you go to work for us—crackpots."

Novak didn't say anything and MacIlheny handed him some press clippings:

LOCAL MEN SEE STARS;
BUILDING SPACE SHIP

and

BUCK ROGERS HEARTS BEAT
BENEATH BUSINESS SUITS

There were others.

"We never claimed," said MacIlheny a little bitterly, "that the *Prototype's* going to take off for the Moon next week or ever. We down-pedal sensationalism; there are perfectly valid military and scientific reasons for space-ship research. We've tried to make it perfectly clear that she's a full-scale model for study purposes, but the damned papers don't care. I know it's scared some good men away from the society and I'd hate to tell you how much it's cut into my business, but my lawyer tells me I'd be a fool to sue." He looked at his watch. "I owed you that much information, Doctor. Now tell me frankly whether you're available."

Novak hesitated.

"Look," said MacIlheny. "Why don't you take a look at the field and the *Prototype*? I have to run, but Friml will be glad to drive you out. You've got to meet Clifton."

When MacIlheny had left, Friml said: "Let's eat first." They went to a businessman's restaurant. Friml had hardly a word to say for himself through the meal, and he kept silence through the drive west to Barstow as the irrigated, roadside land turned arid and then to desert.

"You aren't an enthusiast?" Novak finally asked.

"I'm secretary-treasurer," said Friml.

"Um. Was Mr. MacIlheny deliberately not mentioning the names of the firms that contribute to the A.S.F.S.F.? I thought I caught that."

"You were correct. Contributions are private, by request of the donors. You saw those newspaper clippings."

His tone was vinegar. Friml was a man who didn't think the game was worth the kidding you took for playing it. Then why the devil was he the outfit's secretary-treasurer?

They were driving down a secondary black-top road when the *Prototype* came into view. It had the only vertical lines in

the landscape for as far as the eye could see, and looked sky-piercing. A quadrangle of well-built prefabs surrounded it, and the area was wire-fenced. Signs at intervals forbade trespassing.

There was a youngster reading at a sort of sentry box in the fencing. He glanced at Friml and waved him through. Friml crawled his car to a parking area, where late models were outnumbered by jalopies, and brought it alongside of a monstrous, antique, maroon Rolls Royce. "Mr. Clifton's," he said, vinegar again. "He should be in here." He led Novak to the largest of the prefabs, a twelve-foot Quonset some thirty feet long and mounted on a concrete base.

It was a machine shop. Serious-eyed kids were squinting as they filed at bits of bronze. A girl was running a surface grinder that gushed a plume of small, dull red, hot-looking sparks. High-carbon steel, Novak thought automatically. Piece that size costs plenty.

Clifton, Friml's pointed finger said.

The man was in dungaree pants and a dirty undershirt—no, the top of an old-fashioned union suit with buttons. He was bending over a slow-turning engine lathe, boring out a cast-iron fitting. The boring bar chattered suddenly and he snarled at it: "A-a-ah, ya dirty dog ya!" and slapped off the power switch.

"Mr. Clifton," Friml hailed him, "this is Dr. Michael Novak, the ceramics man I told you about yesterday."

"Harya, Jay. Harya, Mike," he said, giving Novak an oily grip. He needed a shave and he needed some dentistry. He didn't look like any engineer in charge that Novak had ever seen before. He was a completely unimpressive Skid Row type, with a hoarse voice to match.

Clifton was staring at him appraisingly. "So ya wanna join the space hounds, hah? Where's ya Buck Rogers pistol?"

There was a pause.

"Conversation-stopper," said Friml with a meagre smile. "He's got a million of them, Mr. Clifton, would you show Dr. Novak around if it doesn't interrupt anything important?"

Clifton said: "Nah. Bar dug into the finish bore on the flange. I gotta scrap it now; I was crazy to try cast iron. That'll learn me to try to save you guys money; next time I cut the fitting outta nice, expensive, mild steel bar stock. Come on, Mike. Mars or bust, hah?"

He led Novak out of the machine shop and wiped his oily hands on the union suit's top. "You any good?" he asked. "I told the kids I don't want no lid on my hands."

"What's a lid?" Novak demanded.

"Morse-man talk. Fighting word."

"You were a telegrapher?" asked Novak. It seemed to be the only thing to say.

"I been everything! Farmer, seaman, gigolo in B.A., glass blower, tool maker, aero-engineer—bet ya don't believe a goddam word I'm saying."

Disgustedly Novak said: "You win." The whole thing was out of the question—crackpot enthusiasts backing this loudmouthed phony.

"Ask me anything, Mike! Go ahead, ask me anything!" Clifton grinned at him like a terrier.

Novak shrugged and said: "Integral of u to the n , $\log u$, $d-u$."

Clifton fired back: " U to the n -plus-one, bracket, $\log u$ over n -plus-one, minus one over n -plus-one-square, un-bracket—plus C . Ask me a hard one, Mike!"

It was the right answer. Novak happened to remember it as an examination problem that had stuck in his head. Normally you'd look it up in a table of integrals. "Where'd you go to school?" he asked, baffled.

"School? School? What the hell would I go to school for?" Clifton grinned. "I'm a self-made man, Mike. Look at that

rocket, space hound. Look at her."

They had wandered to the *Prototype's* base. Close up, the rocket was a structure of beautifully welded steel plates, with a sewerpipe opening at the rear and no visible means of propulsion.

"The kids love her," Clifton said softly. "I love her. She's my best girl, the round-heeled old bat."

"What would you use for fuel?" Novak demanded.

He laughed. "How the hell should I know, pal? All I know is we need escape velocity, so I build her to take the mechanical shock of escape velocity. *You* worry about the fuel. The kids tell me it's gotta be atomic so you gotta give 'em a throat-liner material that can really take it from here to Mars and back. Oh, you got a job on your hands when you join the space hounds, Mike!"

"This is the craziest thing I ever heard of," said Novak.

Clifton was suddenly serious. "Maybe it ain't so crazy. We work out everything except fuel and then we go to the A.E.C. and say *give*. Do they hold out on us or do they start work on an atomic fuel? The kids got it all figured out. We do our part, A.E.C. does theirs. Why not?"

Novak laughed shortly, remembering the spy mania he had lived in for two years. "They'll do their part," he said. "They'll start by sending a hundred Security and Intelligence boys to kick you off the premises so they can run it themselves."

Clifton slapped him on the back. "*That's* the spirit!" he yelled. "You'll win your Galactic Cross of Merit yet, pal! You're hired!"

"Don't rush me," said Novak, half angrily. "Are they honestly going to deliver on a real lab for me if I sign up? Maybe they don't realize I'll need heavy stuff—rock crushers, ball mills, arc furnaces—maybe a solar furnace would be good out here on the desert. That kind of equipment costs real money."

"They'll deliver," Clifton said solemnly. "Don't low-rate the kids. I'm working from their blue-prints and they're good. Sure, there's bugs—the kids are human. I just had to chuck out their whole system for jettisoning *Proto's* aerodynamic nose. Too gadgety. Now I'm testing a barometer to fire a powder charge that'll blow away the nose when she's out of the atmosphere—whole rig's external, no holes in the hull, no gasket problem. And they design on the conservative side—inclined to underestimate strength of materials. But, by and large, a ver-ry, ver-ry realistic bunch."

Novak was still finding it impossible to decide whether Clifton was a fake, an ignoramus, or a genius. "Where've you worked?" he asked.

"My last job was project engineer with Western Air. They fired me all right, no fear of that. I wear their letter next to my heart." He hauled a bulging greasy wallet from the left hip pocket of the dungarees, rummaged through it, and came up with a wad of paper. Unfolded, it said restrainedly that the personnel manager of Western Aircraft regretted that the Company had no option but to terminate Mr. Clifton's employment since Mr. Clifton had categorically declined to apologize to Dr. Holden.

An eighteen-year-old boy with a crew cut came up and demanded: "Cliff, on the nylon ropes the blue print says they have to test to one-fifty pounds apiece. Does that just mean parting strength of the ropes or the whole rig—ropes whipped to the D-rings and the D-rings anchored in the frame?"

"Be with ya in a minute, Sammy. Go and wait for me." The boy left and Clifton asked: "Think it's a forgery, Mike?"

"Of course not——" began Novak, and then he saw the engineer grinning. He handed back the letter and asked: "Have you been a forger too? Mr. Clifton——"

"Cliff!"

"——Cliff, how did you get hooked up with this? I'm damned if I know what to make of the setup."

"Neither do I. But I don't care. I got hooked up with them when Western canned me. I can't get another aircraft job

because of the industrial black list, and I can't get a Government job because I'm a subversive agent or a spy or some goddamned thing like that." Suddenly he sounded bitter.

"How's that?"

"They don't tell you—you know that; your ad said you was with the A.E.C.—but I guess it's because I been around the world a couple of times. *Maybe*, they figure, just *maybe*, old Cliff sold out when we wasn't watching him. Also my wife's a foreigner, so better be safe than sorry, says Uncle Sam."

"I know that game," Novak said. "Doesn't matter. You wouldn't have lasted five minutes with A.E.C. even if they did hire you."

"Well, well! So I didn't miss a thing! Look, Mike. I gotta go show my kids how to wipe their noses, so I'll let ya rattle with your conscience and I hope to see you around." He gave Novak the oily grip again and walked cockily from the base of the rocket to the Quonsets.

Friml was at Novak's side instantly, looking impatient.

Driving back to Los Angeles, Novak asked bluntly: "Are you people building a moon ship or aren't you?"

"If the A.S.F.S.F. is building a moon ship," said Friml, "I don't want to hear about it. I should tell you that, whatever is being built, they've got a well-kept set of books and a *strictly* controlled audit on the purchasing." He gave Novak a little sidelong look. "One man they tried before Clifton made a very common mistake. He thought that because he knew technical matters and I didn't, he could pad his purchases by arrangement with the vendors' salesmen and I'd be none the wiser. It took exactly eight days for me to see through his plan."

"I get the hint," said Novak wearily. "But I still don't know whether I want the job. Was Clifton really a project engineer with Western Air?"

"I really don't know. I have absolutely no responsibility for procurement of personnel. I can tell you that he has no local or F.B.I. criminal record. I consider it a part of my job to check that far on employees whose duties include recommending expenditures."

Friml left him at the Los Angeles Airport at his request. Novak said he'd get in touch with him in the morning and let him know one way or the other; then he picked up his bag and took a taxi to a downtown hotel. It was 4.30 when he checked in, and he placed a call at once to the personnel department of Western Aircraft.

"I'd like to enquire," he said, "About the employment record of a Mr. Clifton. He says in his, uh, application to us that he was employed as a project engineer at Western Air last year."

"Yes, sir. Mr. Clifton's first name, sir?"

"Ah, I can't make it out from his signature." If he had been told Clifton's first name, he couldn't remember it.

"One moment, sir ... we have a Mr. August Clifton, project engineer, employed two years and five months, separated January seventeenth last year——"

"What's the reason for separation?"

"It says 'incompatibility with supervisory personnel.'"

"That's the one. Thanks very much, miss."

"But don't you want efficiency, health, and the rest of it, sir?"

"Thanks, no." He didn't need them. Anybody who hung on for two years and five months at Western as a projects man and only got fired after a fight *was* efficient and healthy and the rest of it; otherwise he wouldn't have lasted two hours and five minutes. It wasn't like the A.E.C.; at Western, you produced.

No, he thought, stretching out in his clothes on the bed; it wasn't like the A.E.C., and neither was the A.S.F.S.F. He felt a moment of panic at the thought, and knew why he felt it.

Spend enough time in Government and it unmanned you. Each pay check drawn on the Treasury took that much more of yourself away from yourself. Each one of the stiff, blue-green paper oblongs punched with I.B.M. code slots made you that much more willing to forget you might be running a pointless repeat of a research that had been done and done, and done, with nobody the wiser, in scattered and classified labs across the country.

Each swig from the public teat had more and more poppy juice in it. Gradually you forgot you had been another kind of person, holding ideas, fighting for them, working until dawn on coffee, falling for women, getting drunk sometimes. You turned grey after enough of the poppy juice—nice grey.

You said: "Well, now, I wouldn't put it that way," and "There's something to be said on both sides, of course," and "It doesn't pay to go overboard; the big thing is to keep your objectivity."

The nice grey people married early and had a child or two right away to demonstrate that they were normal family men. They had hobbies and talked about them to demonstrate that they weren't one-sided cranks. They drank a little, to demonstrate that they weren't puritans, but not much, to demonstrate that they weren't drunks.

Novak wondered if they tasted bile, as he was tasting it now, thinking of what he had almost become.

IV.

In the morning he phoned the A.S.F.S.F. office that he wanted the job. Friml's cold voice said: "That's fine, Dr. Novak. Mr. MacIlheny will be here for the next half-hour, and I have a contract ready. If you can make it right over——"

The contract hog-tied Novak for one year with options to conduct refractory research and development under the direction of the Society. The salary was the one he had specified in his ad. Novak raised his eyebrows at one clause: it released the employer from liability claims arising out of radiation damage to the employee.

"You really think the Government's going to let you play with hot stuff?" he asked.

He shouldn't have said "play". MacIlheny was hurt and annoyed. "We expect," he said testily, "that the A.E.C. will cooperate with us as a serious research group when we enter the propulsion stage of the programme. They'll be fools if they don't, and we intend to let the country know about it."

Novak shrugged and signed. So did the two Society officers, with the elevator man and the building porter as witnesses. MacIlheny shook Novak's hand ceremoniously after the witnesses were shooed out. "The first thing we want," he said, "is a list of what you'll need and a lab layout. Provisional, of course. There should be some changes after you study the problem in detail?"

"I think not," Novak told him. "A lab's a lab. It's what you do with it that counts. How high can I go?"

Friml looked alarmed. MacIlheny said: "I won't tell you that the sky's the limit. But get what you need, and if you see a chance to save us money without handicapping yourself, take it. Give us the maximum estimated cost and the people you think are the best suppliers for each item."

"*Reputable* firms," said Friml. "The kind of people who'd be prepared to send me a notarized invoice on each purchase."

Novak found the public library and gave himself a big morning in the technical reading room, playing with catalogues and trade-magazine ads. After lunch he came back with quadrille paper and a three-cornered scale. The afternoon went like lightning; he spent it drawing up equipment and supplies lists and making dream layouts for a refractories lab. What he wound up with was an oblong floor plan with a straight-through flow; storage to grinding-and-grading to compounding to firing to cooling to testing. Drunk with power, he threw in a small private office for himself.

Construction costs he knew nothing about, but by combing the used-machinery classifieds he kept equipment and supplies down to thirty-two thousand dollars. He had dinner and returned to the library to read about solar furnaces until they put him out at the ten-o'clock closing.

The next day Friml was up to his neck in page proofs of the A.S.F.S.F. organ *Starward*. Looking mad enough to spit, the secretary-treasurer said: "There's a publications committee, but believe it or not all five of them say they're too rushed

right now and will I please do their work for them. Some of the rank and file resent my drawing a salary. I hope you'll bear that in mind when you hear them ripping me up the back—as you surely will."

He shoved the proofs aside and began to tick his way down Novak's lists. "There's a Marchand calculator in Mr. Clifton's laboratory," he said. "Wouldn't that do for both of you, or must you have one of your own?"

"I can use his."

Friml crossed the Marchand off the list. "I see you want a—a continuous distilled-water outfit. Wouldn't it be cheaper and just as good to install a tank, and truck distilled water in from the city? After all, it's for sale."

"I'm afraid not. I have to have it pure—not the stuff you buy for storage batteries and steam irons. The minute you put distilled water into a glass jar it begins to dissolve impurities out of the glass. Mine has to be made fresh and stored in a tin-lined tank."

"I didn't know that," said Friml. He put a light check mark next to the still, and Novak knew this human ferret would investigate it. Maybe he suspected him of planning to bilk the A.S.F.S.F. by making corn liquor on the side.

"Um. This vacuum pump. Mr. Clifton's had a Cenco Hyvac idle since he completed port-gasket tests a month ago. You might check with him as to its present availability ... otherwise I see no duplications. This will probably be approved by Mr. MacIlheny in a day or two and then we can let the contract for the construction of your lab. I suggest that you spend the day at the field with Mr. Clifton to clear a location for it and exchange views generally. You can take the bus to Barstow and any taxi from there. If you want to be reimbursed you should save the bus ticket stub and get a receipt from the taxi driver for my files. And tonight there's the membership meeting. Mr. MacIlheny asked me to tell you that he'd appreciate a brief talk from you—about five minutes and not too technical."

Friml dove back into the page proofs of *Starward*, and Novak left, feeling a little deflated.

The Greyhound got him to Barstow in ninety minutes. A leather-faced man in a Ford with "Taxi" painted on it said sure he knew where the field was: a two-dollar drive. On the road he asked Novak cautiously: "You one of the scientists?"

"No," said Novak. He humbly thought of himself as an engineer.

"Rocket field's been real good for the town," the driver admitted. "But scientists——" He shook his head. "Wouldn't mind some advice from an older man, would you?"

"Why, no."

"Just—watch out. You can't trust them."

"Scientists?"

"Scientists. I don't say they're all like that, but there's drinkers among them and you know how a drinker is when he gets to talking. Fighting Bob proved it. Not just talk."

This was in reference to the Hoyt speech that claimed on a basis of some very wobbly statistics that the A.E.C. was full of alcoholics. "That so?" asked Novak spinelessly.

"Proved it with figures. And you never know what a scientist's up to."

Enough of this nonsense. "Well, out at the field they're up to building a dummy of a moon ship to find out if it can be done."

"You ain't heard?" The driver's surprise was genuine.

"Heard about what? I'm new here."

"Well, that explains it. It's no dummy moon ship. It's camouflage for an oil-drilling rig. They struck oil there. The scientists are experimenting with it to make cheap gasoline. I heard it from the lineman that tends their power line."

"Well, he's wrong," Novak said. "I've been on the grounds and they aren't doing anything but working on the ship."

The driver shook his head. "Nossir," he said positively. "The thing's a dummy all right, but not for a space ship. Space ships don't work. Nothing for the rocket to push against. It stands to reason you can't fly where there's no air for it to push against. You could fire a cannon to the Moon if you made one big enough, but no man could stand the shock. I *read* about it."

"In the Bennet newspapers?" asked Novak nastily, exasperated at last.

"Sure," said the driver, not realizing that he was being insulted. "Real American papers. Back up Fighting Bob to the hilt." The driver went on to lavish praise of the Bennet-Hoyt line on foreign policy (go it alone, talk ferociously enough and you won't have to fight); economics (everybody should and must have everything he wants without taking it from anybody else); and military affairs (armed forces second to none and an end to the crushing tax burden for support of the armed forces).

Novak stopped listening quite early in the game and merely interjected an occasional automatic "uh-huh" at the pauses. After a while the *Prototype* appeared ahead and he stopped even that.

The rocket, standing alone in the desert like a monument was still awe-inspiring. At the sentry box he introduced himself, and the boy on guard shook his hand warmly. "Glad to have you inboard, sir," he said. The word was unmistakably "inboard"—and when Novak had it figured out he had to bite his lip to keep from laughing. The kid was using rocket-ship slang before there were any rocket ships!

The boy never noticed his effort; he was too busy apologizing for stopping him. "You see, Doctor, people don't take our work seriously. Folks used to drive out here the first month and interrupt and even expect us to lend them our drinking water that we trucked out. As if we were here for their entertainment! Finally a gang of little devils broke into one of the Quonsets after dark and smashed everything they could reach. Four thousand dollars' worth of damage in twenty minutes! We were sick. What *makes* people like that? So we had to put up a real fence and mount guard, even if it doesn't look good. But of course we have nothing to hide."

"Of course——" began Novak. But the boy's face had suddenly changed. He was staring, open-mouthed. "What's the matter?" snapped Novak, beginning to inspect himself. "Have I got a scorpion on me?"

"No," said the boy, and looked away embarrassed. "I'm sorry," he said. "Only it suddenly hit me—maybe you'll be one of the people inboard when she—when she goes. But I shouldn't ask."

"The last I heard," Novak said, "*she* is a full-sized mock-up and isn't going anywhere."

The boy winked one eye slowly.

"All right," Novak shrugged, amused. "Have it your way and I'll see you on Mars. Where's Mr. Clifton?"

"Back of the machine shop—a new testing rig."

Crossing the quadrangle, Novak passed the *Prototype* and stopped for another look. To the Moon? This colossal pile of steel? It was as easy to visualize the Eiffel Tower picking up its four legs and waddling across Paris. No wonder the taxi driver didn't believe in space flight—and no wonder the kid at the gate did. *Credo quia impossibilis*, or however it went. There were people like that.

He heard Clifton before he saw him. The engineer in charge was yelling: "Harder! *Harder!* Is that all the hard ya can bounce? *Harder!*" And a girl was laughing.

Back of the machine shop, in its shadow, Clifton was standing with a stop watch over a vaguely coffin-shaped block of moulded rubber swung from a framework by rope. Most of the ropes were milky nylon. Six of them were manila and had big tension balances, like laundry scales, hooked into them. Towering over Clifton and the framework was a twelve-foot gas-pipe scaffold, and a pretty girl in shorts was climbing a ladder to the top of it.

As Novak watched, she hurled herself from the scaffold into the coffin. Clifton, blaspheming, snapped his stop watch and tried to read the jumping needles on the dials of all six balances at the same time.

"Hello," Novak said.

"Harya, Mike. Mike, this is Amy helping out. Like my rig?"

"I thought they worked all this out at the Wright-Patterson A.F.B. Space Medicine School. It is an acceleration couch, isn't it?"

"Kindly do not speak to me about Air Force Space Medicine," said Clifton distinctly. "It happens to be mostly bushwah. Ya know what happened? They had this ejector-seat problem, blowing a jet pilot out of a plane because he'd get cut in half if he tried to climb out at 600 m.p.h. So they had an acceleration problem and they licked it fine and dandy. So a publicity-crazy general says acceleration is acceleration, what's good enough for an ejector seat is good enough for a space ship and anyway nobody knows what the hell space flight is like so why worry?"

Clifton folded his arms, puffed out his chest, and assumed the Napoleonic stance, with one foot forward and the knee bent. His hoarse voice became an oily parody of the general's. "My gallant public relations officers! Let us enlighten the taxpaying public on what miracles our air force geniuses pass off daily before breakfast. Let us enlighten them via the metropolitan dailies and wire services with pictures. Let us tell them that we have solved all the medical problems of space flight and have established a school of space medicine to prove it. You may now kiss my hand and proceed to your typewriters at the gallop. To hell with the Navy!"

The girl laughed and said: "Cliff, it *can't* be that bad. And if you keep talking treason they'll lock you up and you'll pine away without your sweetheart there." She meant *Proto*.

"A-a-ah, what do you know about it, ya dumb Vassar broad? What time's Iron Jaw pick you up? Time for any more bounces?"

"Barnard, not Vassar," she said, "and no time for more bounces, because he said he'd be here at noon and Grady is the world's best chauffeur." She took a wrap-around skirt from a lower horizontal of the gas-pipe scaffolding and tied it on. "Are you a new member, Mike?" she asked.

"I'm going to work on the reaction chamber and throat liner."

"Metal or ceramic?"

"Ceramic refractories is my field."

"Yes, but what about strength? I was thinking about tungsten metal as a throat-liner material. It's a little fantastic because it oxidizes in air at red heat, but I have an idea. You install a tungsten liner and then install a concentric ceramic liner to shield it. The ceramic liner takes the heat of the exhaust until the ship is out of atmosphere and then you jettison it, exposing the tungsten. In vacuum, tungsten holds up to better than three thousand centigrade——"

Clifton bulled into it. "Ya crazy as a bunny rabbit, Amy! What about atmosphere on Mars or Venus? What about the return trip to Earth? What about working the tungsten? That stuff crystallizes if ya look at it nasty. What about paying for it? Ya might as well use platinum for cost. And what about limited supply? Ya think America's going to do without tool bits and new light bulbs for a year so ya can have five tons of tungsten to play with? Didn't they teach economics at Miss Twitchell's or wherever it was?..."

It was exactly noon by Novak's watch and a black Lincoln rolled through the gate and parked.

"See you at the meeting, Cliff? Glad to have met you, Mike." The girl smiled, and hurried to the car. Novak saw a white-haired man in the back open the door for her, and the car drove off.

"Who was *that*?" Novak asked.

"She's Miss Amelia Earhart Stuart to the society pages," Clifton grinned. "In case ya don't read the society pages, she's the daughter of Wilson Stuart—my old boss at Western. She got bit by the space bug and it drives him crazy. The old man's a roughneck like me, but he's in a wheel chair now. Wrecked his heart years ago test-flying. He's been looking backwards ever since; he thinks we're dangerous crackpots. I hear ya got the job okay. Where do you want the lab?"

They left the test rig and walked around the machine-shop Quonset. Clifton stopped for a moment to measure the *Prototype* with his eye. It was habitual.

"How much of a crew does she—would she—hold?" Novak asked.

"Room for three," Clifton said, still looking at her.

"Navigator, engineer—and what?"

"Stowaway, of course!" Clifton roared. "Where ya been all ya life? A girl stowaway in a tin braseer with maybe a cellophane space suit on. Buckle down, Mike! On the ball or I don't put ya in for the Galactic Cross of Merit!"

Novak wouldn't let himself be kidded. "The youngster at the gate might stow away," he said. "He thinks the *Prototype* is going to take off some day and we just aren't telling the public about it."

Clifton shook his head—regretfully. "Not without the A.E.C. develops a rocket fuel and gives it to us. The bottom two thirds of her is a hollow shell except for structural members. I wish the kid was right. It'd be quite a trip and they'd have quite a time keeping me off the passenger list. But I built the old bat, and I know."

Novak picked an area for his lab and Clifton okayed it. They had lunch from a refrigerator in the machine shop, with a dozen kids hanging on their words.

"Give ya an idea of what we're up against, Mike," Clifton said around a pressed-ham sandwich. "The manhole for *Proto*. It's got to open and close, it's got to take direct sunlight in space, it's got to take space-cold when it's in shadow. What gasket material do you use? What sealing pressure do you use? Nobody can begin to guess. Some conditions you can't duplicate in a lab. So what some smart cookie in the A.S.F.S.F. figured out ten years ago was a wring fit, like jo-blocks. Ya know what I mean?"

Novak did—super-smooth surfaces, the kind on hundred-dollar gauges. Put two of those surfaces together and they clung as if they were magnetized. The theory was that the molecules of the surfaces interpenetrate and the two pieces become—almost—the same piece. "Ingenious," he said.

"Ingenious," muttered Clifton. "I guess that's the word. Because nobody ever in the history of machine shops put a jo-block finish on pieces that size. I got a friend in South Bend, so I sent him the rough-machined manhole cover and seating. The Studebaker people happen to have a big super-finish boring mill left over from the war, sitting in a corner covered with cosmoline. Maybe my friend can con them into taking off the grease and machining a super-finish onto our parts. If not, I'll try to hand scrape them. If I can't do it on circular pieces—and I probably can't—I'll scrap them and order square forgings. You think *you* got troubles with your throat liner?"

"Generally, what kind of shape is *Proto* in?"

"Generally, damn fine shape. I finish testing the acceleration couch today. If it passes I order two more pads from Akron and install them. Then we're all ready to go except for the manhole problem and a little matter of a fuel and propulsion system that oughtta be cleared up in eight-ten years. A detail."

Clifton picked his teeth and led Novak to a blue-print file. He yanked open one of the big, flat drawers and pulled out a 36-by-48 blue print. "Here we are," he said. "The chamber, liner, and vane. You're gonna have to make it; you might as well look it over. I'm gonna appoint a volunteer and supervise some more crash dives."

Novak took the print to an empty corner of the shop and spread it out on a work-bench. He looked first at the ruled box in the lower right-hand corner for specifications. He noted that the drawing had been made some three months ago by "J. MacI." and checked by him. Material: ceramic refractory; melting point higher than 3,000°C.; coefficient of expansion, less than .000,004; bulk modulus ...

Novak laughed incredulously.

It was *all* there—stretch, twist, and bulk moduli, coefficient of elasticity, everything except how to make it. MacIlheny had laid down complete specifications for the not-yet-developed liner material. A childish performance! He suspected that the president of the A.S.F.S.F. was simply showing off his technical smattering and was mighty proud of himself. Novak wondered how to tell MacIlheny tactfully that under the circumstances it would be smarter to lay down specifications in the most general terms.

He studied them again and laughed again. Sure he could probably turn out something like that—one of the boron

carbides. But it would be a hell of a note if A.E.C. came up with a 3,750-degree fuel and they had a 3,500-degree liner, or if the A.E.C. came up with a hydroxide fuel that would dissolve a liner which was only acidproof. What MacIlheny should have said was something simpler and humbler, like: "Give us the best compromise you can between strength and thermal-shock resistance. And, please, as much immunity to all forms of chemical attack as you can manage."

Well, he'd tell him nicely—somehow.

Novak looked from the specifications to the drawings themselves and thought at first that there had been some mistake—the right drawings on the wrong sheet, the wrong drawings on the right sheet—but after a puzzled moment he recognized them vaguely as a reaction chamber and throat liner.

They were all wrong; all, all wrong.

He knew quite well from N.E.P.A. what reaction chambers and throat liners for jet aircraft looked like. He knew standard design doctrine for flow, turbulence, Venturi effect, and the rest of it. There were tricks that had been declassified when newer, better tricks came along. This—this *thing*—blithely by-passed the published tricks and went in for odd notions of its own. The ratio of combustion volume to throat volume was unheard of. The taper was unheard of. The cross section was an ellipse of carefully defined eccentricity instead of the circle it should be. There was only one hole for fuel injection—only one hole! Ridiculous.

While the shop was filled with the noise of a youngster inexpertly hack-sawing sheet metal in a corner, Novak slowly realized that it was not ridiculous at all. It wasn't MacIlheny showing off; no, not at all. Anybody who could read a popular-science magazine knew enough not to design a chamber and throat like that.

But MacIlheny knew better.

He walked slowly out to the back of the shop where Clifton was clocking dives into the acceleration couch. "Cliff," he said, "can I see you for a minute?"

"Sure, Mike. As long as ya don't expect any help from me."

Together they looked down at the spread blue print, and Novak said: "The kid at the gate was right. They are going to take off some day and they just aren't telling the public about it."

"What ya talking?" demanded Clifton. "All I see there is lines on paper. Don't try to kid a kidder, Mike."

Novak said: "The specs are for me to develop a material to handle a certain particular fuel with known heat, thrust, and chemical properties. The drawings are the wrong shape. Very wrong. I know conventional jet theory and I have never seen anything like the shapes they want for the chamber and throat of that—thing—out there."

"Maybe it's a mistake," Clifton said uncertainly.

Then he cursed himself. "Mistake! Mistake! Why don't I act my age? Mistakes like this them boys don't make. The acceleration couch. They designed it eight years ago on paper. It works better than them things the Air Force been designing and building and field-testing for fifteen years now."

Novak said: "People who can do that aren't going to get the throat and chamber so wrong they don't look like any throat and chamber ever used before. *They've got a fuel and they know its performance.*"

Clifton was looking at the data. "MacIlheny designed it—it says here. An insurance man three months ago sat down to design a chamber and throat, did it, checked it, and turned it over to you to develop the material and fabricate the pieces. I wonder where he got it, Mike. Russia? Argentina? China?"

"Twenty countries have atomic energy programmes," Novak said. "And one year ago the A.S.F.S.F. suddenly got a lot of money—a hell of a lot of money. I ordered thirty-two thousand dollars' worth of gear and Friml didn't turn a hair."

Clifton muttered: "A couple of million bucks so far, I figure it. Grey-market steel. Rush construction—overtime never bothered them as long as the work got done. Stringing the power line, drilling the well. A couple million bucks and nobody tells ya where it came from." He turned to Novak and gripped his arm earnestly. "Nah, Mike," he said softly. "It's *crazy*. Why should a country do research on foreign soil through stooges. It just ain't possible."

"Oh, God!" said Novak. His stomach turned over.

"What's the matter, kid?"

"I just thought of a swell reason," he said slowly. "What if a small country like the Netherlands, or a densely populated country like India, stumbled on a rocket fuel? And what if the fuel was terribly dangerous? Maybe it could go off by accident and take a couple of hundred miles of terrain with it. Maybe it's radiologically bad and poisons everybody for a hundred miles around if it escapes. Wouldn't they want the proving ground to be outside their own country in that case?"

There was a long pause.

Clifton said: "Yeah. I think they might. If it blows up on their own ground they lose all their space-ship talent and don't get a space ship. If it blows up on our ground they also don't get a space ship, but they do deprive Uncle Sam of a lot of space-ship talent. But how—if the fuel don't blow up California—do they take over the space ship?"

"I don't know, Cliff. Maybe MacIlheny flies it to Leningrad and the Red Army takes it from there. Maybe Friml flies it to Buenos Aires and the Guardia Peronista."

"Maybe," said Cliff. "Say, Mike, I understand in these cloak-and-dagger things they kill you if you find out too much."

"Yeah, I've heard of that, Cliff. Maybe we'll get the Galactic Cross of Merit posthumously. Cliff, *why* would anybody want to get to the Moon bad enough to do it in a crazy way like this?"

The engineer took a gnawed hunk of tobacco from his hip pocket and bit off a cud. "I can tell ya what MacIlheny told me. Our president, I used to think, was just a space hound and used the military-necessity argument to cover it up. Now, I don't know. Maybe the military argument was foremost in his mind all the time.

"MacIlheny says the first country to the Moon has got it *made*. First rocket ship establishes a feeble little pressure dome with one man left in it. If he's lucky he lives until the second trip, which brings him a buddy, more food and oxygen, and a stronger outer shell for his pressure dome. After about ten trips you got a corporal's squad on the Moon nicely dug in and you can start bringing them radar gear and launchers for bombardment rockets homing on earth points.

"Nobody can reach you there, get it? *Nobody*. The first trip has always gotta bring enough stuff to keep one man alive—if he's lucky—until the next trip. It takes a lotta stuff when ya figure air and water. The first country to get there has the bulge because when country two lands their moon pioneer the corporal's squad men hike on over in their space suits and stick a pin in his pressure dome and—he dies. Second country can complain to the U.N., and what can they prove? The U.N. don't have observers on the Moon. And if the second country jumps the first country with an A-bomb attack, they're gonna *die*. Because they can't jump the retaliation base on the Moon."

He squirted tobacco juice between his teeth. "That's simplified for the kiddies," he said, "but that's about the way MacIlheny tells it."

"Sounds reasonable," Novak said. "Personally I am going right now to the nearest regional A.E.C. Security and Intelligence Office. You want to come along?" He hoped he had put the question casually. It had occurred to him that, for all his apparent surprise, Clifton was a logical candidate for Spy Number One.

"Sure," said Clifton. "I'll drive you. There's bound to be one in L.A."

V.

There was, in the Federal Building.

Anheier, the agent in charge, was a tall, calm man. "Just one minute, gentlemen," he said, and spoke into his intercom. "The file on the American Society for Space Flight, Los Angeles," he said, and smiled at their surprise. "We're not a Gestapo," he said, "but we have a job to do. It's the investigation of possible threats to national security as they may involve atomic energy. Naturally, the space-flight group would be of interest to us. If the people of this country only knew the patience and thoroughness—here we are."

The file was bulky. Anheier studied it in silence for minutes. "It seems to be a very clean organization," he said at last.

"During the past fifteen years derogatory informations have been filed from time to time, first with the F.B.I. and later with us. The investigations that followed did not produce evidence of any law violations. Since that's the case, I can tell you that the most recent investigation followed a complaint from a certain rank-and-file member that Mr. Joel Friml, your secretary-treasure, was a foreign agent. We found Mr. Friml's background spotless and broke down the complainant. It was a simple case of jealousy. There seems to be a certain amount of, say, spite work and politics in an organization as—as visionary as yours."

"Are you suggesting that we're cranks?" Novak demanded stiffly. "I'm a Doctor of Philosophy of the University of Illinois and I've held a responsible position with the A.E.C. And Mr. Clifton has been a project engineer with Western Aircraft."

"By no means, by no means!" Anheier said hastily. "I know your backgrounds, gentlemen." There was something on his face that was the next thing to a smile. Novak was suddenly, sickeningly sure that Anheier, with patience and thoroughness, had learned how he had socked his A.E.C. director in the jaw and how Clifton had been fired after a fight with his boss. A couple of congenital hotheads, Anheier would calmly decide; unemployables who can't get along with people; crank denouncers and accusers.

Anheier was saying, poker-faced: "Of course we want complete depositions from you on your—your information."

He buzzed and a stenographer came in with a small, black, court machine. "And if investigation seems in order, of course we'll get going with no lost time. First give your name and personal data to the stenographer and then your facts, if you please." He leaned back calmly, and the stenographer zipped out the paper box of his machine and poised his fingers. He looked bored.

"My name is Michael Novak," Novak said, fighting to keep his voice calm and clear. The stenographer's fingers bumped the keys and the paper tape moved up an inch. "I live at the Revere Hotel in Los Angeles. I am a ceramic engineer with the B.Sc. from Rensselaer Polytechnic Institute and M.Sc. and Ph.D. from the University of Illinois. I was employed after getting my doctorate by the U.S. Atomic Energy Commission in various grades, the last and highest being A.E.C. 18. I—I left the A.E.C. last month and took employment with an organization called the American Society for Space Flight at its Los Angeles headquarters.

"I had no previous knowledge of this organization. I was told by officers that it is now making a full-scale metal mock-up of a moon ship to study structural and engineering problems. Purportedly it has no space-ship fuel in mind and intends to ask the co-operation of the A.E.C. in solving this problem after it has solved all the other problems connected with the design of a space ship.

"I believe, however, that this is a cover story. I believe that about one year ago the organization was supplied with funds to build an actual space ship by a foreign power which has developed a space-ship fuel.

"My reasons for believing this are that the organization has liberal funds behind it which are supposed to be private contributions from industry, but there are no signs of outside interests in the project; further, I was ordered to execute an extremely unorthodox design for a reaction chamber and throat liner, which strongly suggests that the organization has an atomic space-ship fuel and knows its characteristics.

"I want to emphasise that the unorthodox design which aroused my suspicions was purportedly drawn and checked by James MacIlheny, president of the organization, an insurance man who disclaims any special technical training. In other, nonvital details of the space ship, designing was done mostly by technical men employed in the aircraft industry and by local college students and teachers following space flight as a hobby of a technical nature. It is my belief that the reaction chamber and throat liner were designed by a foreign power to fit their atomic fuel and were furnished to MacIlheny.

"I do not know why a foreign power should erect a space ship off its own territory. One possibility that occurs to me is that their fuel might be extremely dangerous from a radiological or explosive standpoint or both, and that the foreign power may be unwilling to risk a catastrophic explosion on its own ground or radiation sickness to large numbers of its own valued personnel."

He stopped and thought—but that was all there was to say.

Anheier said calmly: "Thank you, Dr. Novak. And now Mr. Clifton, please."

The engineer cleared his throat and said aggressively: "I'm August Clifton. I been a self-educated aero engineer for nine years. For Douglas I designed the B-108 air frame and I rode production line at their Omaha plant. Then I worked for Western Air, specializing in control systems for multijet aircraft. Last year I left Western and went to work for the A.S.F.S.F."

"My ideas about the A.S.F.S.F.'s backing and what they're up to are the same as Novak's. I been around the Society longer, so I can say more definitely than him that there is not one sign of any business or industry having any stake in what's going on out at the field. That's all."

"Thanks, Mr. Clifton. They'll be typed in a moment." The stenographer left. "I understand there's one prominent industrialist who shows some interest in the Society? Mr. Stuart?" There was a ponderously roguish note in Anheier's voice.

"Ya crazy, Anheier," Clifton said disgustedly. "He's just looking after his daughter. *You* think we're nuts? You should hear Iron Jaw take off on us?"

"I know," smiled Anheier hastily. "I was only joking."

"What about MacIlheny?" asked Novak. "Have you investigated him?"

Anheier leafed through the A.S.F.S.F. file. "Thoroughly," he said. "Mr. MacIlheny is a typical spy——"

"*What?*"

"——I mean to say, he's the kind of fellow who's in a good position to spy, but he isn't and doesn't. He has no foreign contacts and none of the known foreign agents in this country have gone anywhere near him——"

"What ya talking?" demanded Clifton. "You mean there's spies running around and you don't pick them up?"

"I said foreign agents—news-service men, exchange students, businessmen, duly registered propaganda people, diplomatic and consular personnel—there's no end to them. *They* don't break any laws, but they recruit people who do. God knows *how* they recruit them. Every American knows that since the Rosenberg cases the penalty for espionage by a citizen is, in effect, death. That's the way the country wanted it, and that's the way it is."

"Why do you say MacIlheny's typical?" asked Novak. He had a half-formed hope that this human iceberg might give them some practical words on technique, even if he refused to get excited about their news.

"Mata Hari's out," said Anheier comfortably. "You've seen spies in the papers, Dr. Novak." To be sure, he had—ordinary faces, bewildered, ashamed, cowering from the flash bulbs. "I came up via the accountancy route myself so I didn't see a great deal of the espionage side," Anheier confessed a bit wistfully. "But I can tell you that your modern spy in America is a part-timer earning a legitimate living at some legitimate line. Import-export used to be a favourite, but it was too obvious."

"Hell, I should think so," grinned Clifton.

Anheier went on: "Now they recruit whatever they can, and get technical people whenever possible. This is because your typical state secret nowadays is not a map or code or military agreement but an industrial process."

"The Manhattan District under General Groves and the British wartime atomic establishment were veritable sieves. The Russians learned free of charge that calutron separation of U-235 from U-238 was impractical and had to be abandoned. They learned, apparently, that gaseous diffusion is *the* way to get the fissionable isotope. They learned that implosion with shaped charges is a practical way to assemble a critical mass of fissionable material. They were saved millions of dead-ended man-hours by this information."

"Security's taken a nice little upswing since then, but we still have secrets and there are still spies, even though the penalty is death. Some do it for money, some are fanatics—some, I suppose, just don't realize the seriousness of it. Here are your depositions, gentlemen."

They read them and signed them.

Anheier shook their hands and said: "I want to thank you both for doing your patriotic duty as you saw it. I assure you that your information will be carefully studied and appropriate action will be taken. If you learn of anything else affecting national security in the atomic area in your opinion, I hope you won't hesitate to let us know about it." Clearly it was a speech he had made hundreds of times—or thousands. The brush-off.

"Mr. Anheier," Novak said, "what if we take this to the F.B.I.? They might regard it more seriously than you seem to."

The big, calm man put his palms out protestingly. "Please, Dr. Novak," he said. "I assure you that your information will be thoroughly processed. As to the F.B.I., you're perfectly free to go to them if you wish, but it would be wasted motion. Cases in the atomic area that come to the F.B.I. are automatically bucked to us—a basic policy decision, and a wise one in my opinion. Technical factors and classified information are so often involved——"

In the street Novak said disgustedly: "He didn't ask us any questions. He didn't ask us whether we were going to quit or not."

"Well—are we?"

"I guess I am—I don't know, Cliff. Maybe I'm wrong about the whole business. Maybe I'm as crazy as Anheier thinks I am."

"Let's go to my place," Clifton said. "We oughtta go to the A.S.F.S.F. membership meeting tonight after we eat."

"Cripes, I'm supposed to make a speech!"

"Just tell 'em hello."

They got into Clifton's car, the long, tall, 1930 Rolls with the lovingly maintained power plant, and roared through Los Angeles. Clifton drove like a maniac, glaring down from his height on underslung late models below and passing them with muttered fusillades of curses. "Me, I like a car with *character*," he growled, barreling the Rolls around a '56 Buick.

His home was in a pretty, wooded canyon dotted with houses. Gravel flew as he spun into the driveway.

"Come and meet Lilly," he said.

Outside, the Clifton house was an ordinary five-room bungalow. Inside it was the dope-dream of a hobbyist run amuck. Like geologic strata, tools and supplies overlaid the furniture. Novak recognized plasticene, clay, glazes, modeling tools and hooks, easels, sketch boxes, cameras, projectors, enlargers, gold-leaf burnishers, leather tools, jeweller's tools and the gear of carpenters, machinists, plumbers, electricians and radio hams. Lilly was placidly reading an astrology magazine in the middle of the debris. She was about thirty-five: a plump, grey-eyed blonde in halter and shorts. The sight of her seemed to pick Clifton up like a shot of brandy.

"Mama!" he yelled, kissing her loudly. "I'm sick of you. I brought you this here young man to run away with. Kindly leave without making no unnecessary disturbance. His name is Mike."

"Hallo," she said calmly. "Don't pay him no attention; he always yokes. Excuse how I talk; I am a Danish. How many letters you got in your full complete name?"

"Uh—twelve."

"Good," she dimpled. "I am twelve also. We will be friends, it means."

"I'm very glad," Novak said faintly.

"Mike, you've been factored?"

"I don't think I understand——"

"It's biomat'ematics. You know? You go to a biomat'ematicist and he finds the mat'ematical for-moola of you subconscious and he factors out the traumas. It's va-a-ary simple." Her face fell a little. "Only I got a Danish-speaking

subconscious of course, so vit' me it goes a liddle slow. Funny"—she shook her head—"same t'ing happened to me years ago vit' di'netics. Cliff, you gonna give Mike a drink or is he like the other young feller you had here last month? Feller that broke the big mirror and you nineteen-inch cat'ode-ray tube and my Svedish pitcher——"

"How the hell was I supposed to know?" he roared. In an aside: "That was Friml, Mike. He got pretty bad."

"Friml?" asked Novak incredulously. "The ice-water kid?"

"He should go to a biomat'ematicist," sighed Lilly. "If ever a boy needed factoring, it's him. Make me only a liddle one please; I don't eat yet today."

She had a little Martini and Clifton and Novak had big ones.

"We all go to the meeting tonight I guess? First I want *biftek aux pommes de terre* someplace."

"What the hell, Mama!" Clifton objected. "This time yesterday you was a vegetarian for life."

"I change my mind," she said. "Go get shaved up and dress you'self and we go someplace for *biftek*."

When Clifton appeared—shaved, dressed, and subdued—Lilly was still in the bedroom, putting on finishing touches. The two men had another martini apiece.

"What about the contracts?" Novak asked.

Clifton understood. "If they try to hold us to them we could just lie down on the job and let them pay us. Hate to work it like that, though. It'd be dull."

"It's still the craziest business I ever heard of."

Lilly appeared, looking sexy in a black dinner dress with a coronet of blonde hair swept up from her creamy neck. Clifton let out a long, loud wolf-howl and said: "The hell with the beefsteaks and the meeting. Let's——"

"Later," said Lilly firmly.

As the maroon Rolls thundered down the canyon, Clifton said casually: "I may quit the space hounds, Mama."

"So what you gonna do for a job?"

"Buy you a red dress and turn mack, I guess. Nah, ya too old and ugly. Maybe I'll open a radio shop or ship out again for an electrician; I guess I still got my card. I kinda hate to leave my best girl out there in the desert, but the whole thing's a joke. She's pretty, but she'll never amount to a damn."

Novak knew why he was lying about the reason. *I understand in these cloak-and-dagger things they kill you if you find out too much.*

VI.

They had dinner at a downtown restaurant and were at the A.S.F.S.F. meeting hall by 8.30. Novak was alarmed when the building turned out to be the Los Angeles Slovak Sokol Hall, rented for the occasion.

"Foreigners!" he exclaimed. "Does the A.S.F.S.F. go around *looking* for jams to get into?"

"Relax, Mike," Clifton told him. "The Sokol's strictly American by now. They got a long anti-Communist record."

Still, fretted Novak, foreigners—Slavic foreigners. The building was in the same run-down area that housed the Society's business office. It was liberally hung with American flags and patriotic sentiments. Inconspicuous on the lobby walls were a few photographs of group calisthenics and marchers in Czech national costumes, from decades ago.

A well-worn placard on an easel said that the A.S.F.S.F. meeting was being held at 8.30 in the main hall, straight ahead and up the stairs.

About a score of people in the lobby were having final smokes and talking. Novak could divide them easily into two

types: juvenile space hounds and employed hobbyists. The hobbyists were what you'd see at any engineers' convention: pipe-smokers, smiling men, neat, tanned. The space hounds were any collection of juvenile enthusiasts anywhere—more mature than an equal number of hot-rod addicts, perhaps, but still given to nervous laughter, horse-play, and catchwords.

Their entrance had been the signal for the younger element to surround Clifton and bombard him with questions.

"Cliff, how she coming?"

"Mr. Clifton, need a good carpenter at the field?"

"How's the acceleration couch coming, Cliff?"

"Could we get that boring mill at South Bend?"

"Shaddap!" said Clifton. "Leave a man breathe, will ya!" They loved him for it. "What's the movie tonight?"

"A stinker," one girl told him. "*Pirates of the Void*, with Marsha Denny and Lawrence Malone. Strictly for yocks."

"They show a space-flight movie," Clifton explained to Novak. "There ain't enough business to kill the time and send everybody home in the proper state of exhaustion." He towed his wife and Novak up the stairs, where a youngster at a card table challenged their membership. They were clamourously identified by a dozen youngsters and went in. The hall seated about four hundred and had a stage with a movie screen and more American flags.

"Better sit in the back——" began Clifton, and then: "For God's sake!" It was Anheier, smiling nervously.

"Hello," said the Security man. "I thought I'd combine business with pleasure. Marsha Denny's a great favourite of mine and I understand there's going to be a preview tonight."

"Well, enjoy yourself," Clifton said coldly. He took Lilly and Novak to the left rear corner of the auditorium and they sat down. He told his wife: "An A.E.C. guy we met. A creep."

MacIlheny climbed to the stage and called to stragglers in the back of the hall: "Okay, men. Let's go." They found seats.

Crack went the gavel. "The-meeting-is-called-to-order. The-chair-will-entertain-a-motion-to-adopt-the-standard-agenda-as-laid-down-in-the-organization's-byelaws."

"So move," said somebody, and there was a ragged chorus of seconds.

"All-in-favor-signify-by-raising-one-hand-any-opposed? The-motion-seems-to-be-and-is-carried. First-on-the-agenda-is-the-reading-of-previous-meetings-minutes."

Somebody stuck his hand up, was recognized, and moved that the minutes be accepted as read. The motion was seconded and carried without excitement. So were motions to accept and adopt reports of the membership, orbit computation, publications, finance, structural problems and control mechanisms committees.

"Making good time," Clifton commented.

Under "good and welfare" a belligerent-looking youngster got recognized and demanded the impeachment of the secretary-treasurer. There was a very mild, mixed demonstration: some applause and some yells of "Sit down!" and "Shuddup!" MacIlheny rapped for order.

"The motion is in order," he wearily announced. "Is there a second?" There was—another belligerent kid.

"In seconding this motion," he said loudly, "I just want to go over some ground that's probably familiar to us all. With due respect to the majority's decision, I still feel that there's no place for salaried employees in the A.S.F.S.F. But if there *has* to be a paid secretary-treasurer, I'm damned if I see why an outsider with no special interest in space flight _____"

Friml was on his feet in the front row, clamouring for recognition on a point of personal privilege.

"Damn it, Friml, I wasn't insulting you——"

"That's for the chair to decide, Mr. Grady! I suggest you pipe down and let him."

"Who're you telling to——"

MacIlheny hammered for silence. "Chair recognizes Mr. Friml."

"I simply want a ruling on the propriety of Mr. Grady's language. Thank you."

"The chair rules that Mr. Grady's remarks were improper and cautions him to moderate his language."

Breathing hard, the youngster tried again. "In seconding this motion to impeach, I want to point out that there are members with *much* more seniority in the organization than Mr. Friml and with a long-demonstrated record of interest in space flight which he cannot match."

MacIlheny called for debate and recognized one of the engineer-types.

"It should be evident to all of us," the engineer said soothingly, "that the criterion for the secretary-treasurer's office ought to be *competence*. We're not playing with marbles any more—I'm happy to say. And I for one am very much relieved that we have the services of a man with a B.B.A., an M.B.A., and a C.P.A. after his name.

"Now, I may have more organizational experience than Mr. Grady, since I've been somewhat active in the A.S.M.E. and the aeronautical societies. I name no names—but in one of those groups we were unwise enough to elect a treasurer who, with all the good will in the world, simply didn't know how to handle the job. We were rooked blind before we knew what hit us, and it took a year to straighten the records out. I don't want that to happen to the A.S.F.S.F., and I seriously urge that the members here vote against the impeachment. Let's not monkey with a smooth-running machine. Which is what we've got now."

There was a lot of applause.

A thin, dark girl, rather plain, was recognized. Her voice was shrill with neurotic hatred. "I don't know what's become of the A.S.F.S.F. In one year I've seen a decent, democratic organization turned into a little despotism with half a dozen people—if that!—running the works while the plain members are left in the dark. Who is this Friml? How do we know he's so good if we don't know the amount and nature of the contributions he handles? And *Mr.* August Clifton, whom everybody is so proud of, I happen to know he was fired from Western Aircraft! The fact is, MacIlheny's got some cash donors in his hip pocket and we're all afraid to whisper because he might——"

MacIlheny pounded for silence. "The chair rules Miss Gingrich out of order," he said. "This is debate on a motion to impeach Mr. Friml and not to reconsider a policy of accepting contributions in confidence, which was approved by the membership as the minutes show. Miss Stuart, you're recognized."

Amy Stuart got up looking grim. "I want to make two statements. First, on a point of personal privilege, that Mr. Clifton was fired from Western because he was too high-spirited to get along in a rather conservative outfit and not for incompetence. More than once I've heard my father say that Mr. Clifton was—or almost was—the best man he had working for him.

"Second, I move to close debate."

"Second the motion," somebody called from the floor.

Miss Gingrich was on her feet shrilling: "Gag rule! Nobody can open his mouth around here except the Holy Three and their stooges! We were doing all right before MacIlheny——" The rest was lost in shouts of disapproval and the whacking of the gavel. The girl stood silently for a moment and then sat down, trembling.

"Motion to close debate has been made and seconded. This motion takes precedence and is unamendable. All in favour raise one hand." A forest of hands went up. "Any opposed?" Maybe twenty. "The motion is carried. We now have before us a motion to impeach Mr. Friml, our secretary-treasurer. All in favour." The same twenty hands. "Opposed?" The forest of hands rose again, and a few kids cried: "No, no!"

"The motion is defeated. Unless there are further matters under good and welfare"—he was refusing to let his eye be caught, and half a dozen members were trying to catch it—"we will proceed to the introduction of a new A.S.F.S.F. full-

time scientific worker. Dr. Michael Novak comes to us from two years with the United States Atomic Energy Commission. He has been working with high-tensile, refractory ceramic materials—a vital field in rocketry; I'm sure the application to our work is obvious to all. Dr. Novak."

He was on his feet and starting down the aisle to a polite burst of applause. They might be spies or they might not; he might be working for them tomorrow or he might not, but meanwhile there was a certain rigmarole you went through at these things, and he knew it well.

"Mr. President, members, and guests, thank you." Now the joke. "My field of work stems from very early times. It was a cave man who founded ceramic engineering when he accidentally let a mud-daubed wicker-basket fall into his campfire and pulled out, after the fire died down, the first earthenware pot. I presume he did not realize that he was also a very important pioneer of space flight." A satisfactory chuckle.

Now the erudition. "Basically, my problem is to develop a material which is strong, workable, and heat-resistant. For some years the way to tackle such a job has been to hunt the material among the so-called 'solid solutions'. An alloy is a familiar example of a solid solution—the kind in which both the solvent and the solute are metals.

"The substance tungsten carbide is well known to any of you who have machine-shop experience. It is a solid solution with one non-metallic constituent, and its properties have revolutionized industrial production. Dies and tool bits of this fantastically hard stuff have probably increased the productivity of this country by several per cent with no other changes being put into effect. Idle time of machine tools has been reduced because tungsten-carbide bits go on, and on, and on without resharpening. Idle time on presses of all sorts has been reduced because tungsten-carbide dies go on, and on, and on without replacement.

"This is only one example of the way Mother Nature comes up with the answer to your particular problem if you ask her in the right way. She also offers among the solid solutions the chromium and cobalt carbides, which top tungsten carbide for refractory qualities, and the boron carbides with which I intend to work.

"In the solid solutions there is a situation that rules out dramatic, abrupt crystallizations of one's problem. An organic chemist trying to synthesize a particular molecule may leap up with a shriek of 'eureka—I've got it!' And so he may, for an organic molecule either is there or it isn't: a yes-or-no situation. But in working with solutions rather than compounds, there is continuous variation of solvent to solute. Theoretically, it would take an infinite amount of time to explore the properties of *every* boron carbide, even if their properties varied simply and continuously with the ratio of constituents alone. But it is more complicated than that.

"Actually the properties you seek in your carbides do not appear when you turn out a batch fresh from your crucible. There is the complicated business of ageing, in which the carbide spends a certain time at a certain temperature. Two more variables. And in some cases the ageing should be conducted in a special atmosphere—perhaps helium or argon. Another variable! And secondary properties must be considered. For example, the standard ceramic bond to metal is obtained by heating both parts to red heat and plunging them into liquid air. There are carbides that may have every other desirable property but which cannot take such a drastic thermal shock."

MacIlheny, in the front row, was looking at his watch. Time for the windup. "I hope I've given you an idea of what we're up against. But I hope I haven't given you an idea that the problem's uncrackable in a less-than-infinite amount of time, because it isn't. Experiments in some number must be made, but mathematics comes to the aid of the researcher to tell him when he's on the right track and when he's going astray. With the aid of the theory of least squares, plenty of sweat, and a little dumb luck I hope before long to be able to report to you that I've developed a material which can take the heat and thrust of any escape-velocity fuel which may some day come along."

The applause was generous.

"We have the privilege tonight," MacIlheny was saying, "of being the first audience in this area to see the new space-flight film *Pirates of the Void*—" There were a few ironical cheers. "—through the kindness of Mr. Riefenstahl of United Productions' promotion staff. Audience comment cards will be available on the way out. I think it would be only fair and courteous if all of us made it a point to get one and fill it out, giving our—*serious*—opinion of the movie. And I'd like to add that Sokol Hall has made *two* projection machines available to us, so that this time there will be no interruption for changing between reels." The cheers at that were not ironical.

"I'm gonna the men's room," Clifton announced, and left.

"Cliff don' like movies much," Lilly announced proudly. "He'll be back."

The lights went out and *Pirates of the Void* went on with a fanfare and the United Productions monogram.

The film, thought Novak as he watched, was another case of the public's faith that space flight is an impossibility. It was a fable in which the actors wore odd garments: the men, shiny overalls; and the women, shiny shorts and bras. The time was far in the future—far enough for there to be pirates of space and a Space Navy of the United World to battle them. Space flight tomorrow, but never space flight today. *But MacIlheny had a fuel and knew its performance.*

He leaned back, wishing he could smoke, and saw Marsha Denny's problem unfold. Marsha was a nurse in the Space Navy and she had a brother (but there was a plant indicating that he wasn't really her brother, though she didn't yet know that), in the Pirate Fleet, high up. She was in love with Lawrence Malone, who took the part of the muscular G-2 of the Space Navy and had assigned himself the mission of penetrating the Pirate Fleet in the guise of a deserter from the regulars.

Somehow fifteen minutes of it passed, and Lilly leaned across the seat between them. "Mike," she asked worriedly, "you mind doing somet'ing for me? You go and find Cliff? He's gone an awful long time."

"Why, sure," he whispered. "Glad to get out of here."

He slipped from the dark auditorium and promptly lit a cigarette. *Men's Room*, said a sign with an arrow. He followed it to a big, empty washroom with six booths. One of the doors was closed.

"Cliff?" he called, embarrassed. There was no answer.

Cliff must be in the corridor somewhere. His eye was caught by the shine of gold on the corner of a washstand. A wedding band—Cliff's wedding band? Slipped it off before he washed his hands? There was no engraving in it and he didn't remember what Cliff's ring looked like; just that he wore one.

Maybe——

"Mister," he said to the closed door, "I found a gold ring on the washstand. You lose it?"

There was no answer. A thread of crimson blood snaked from under the closed door, slowly over the tiled floor, seeking a bright brass drain.

I understand in these cloak-and-dagger things they kill you if you find out too much.

Part Two

FOREWORD

Michael Novak, ceramic engineer, working in the Nuclear Energy for the Propulsion of Aircraft (NEPA), Division of the U.S. Atomic Energy Commission, is inexplicably transferred to the Argonne National Laboratory in Chicago where his particular talents are entirely wasted in the field of pure nuclear theory. Attempting in vain to get a suitable transfer he forcibly resigns and attempts to get a job elsewhere. The fact that he had struck the Research Director when handing in his resignation goes against him wherever he applies, and he is getting more than despondent when he receives a curious letter from a Los Angeles office offering him full-time work in refractories research and development with high-altitude jet aircraft.

The mock-up Moon rocket being built by the American Society for Space Flight is nearing completion, but Clifton's murder complicates the final details and Michael Novak takes over. From here on it is success or failure for the Society—with the espionage net drawing tighter

Intrigued by the apparent mystery he travels to Los Angeles and is appalled to find that the office belongs to an obscure amateur organisation known as the American Society for Space Flight. He meets Mr. Friml, the Secretary, and Mr. MacIlheny the President, who assure him that the Society has a progressive programme of development, plus laboratories and a proving ground and unlimited capital, but refuse to disclose where their funds are obtained. Sceptical but still intrigued, Novak goes with Friml to the Society's launching ground and is amazed to find a full-scale steel mock-up of a space ship standing on the field.

about Novak's neck every hour.

He is introduced to Clifton the engineer in charge of construction and Friml explains that the one thing lacking is a suitable fuel. He has already been to see Daniel Holland, chief of the U.S. Atomic Energy Commission, in Washington, but the Government were not interested in producing a fuel for the Society. Their plan, states Friml, is to complete the ship and then the Government would be forced to do something about the propulsion unit before any other World power became too interested in the project.

Novak accepts the position, is assigned a workshop and laboratory, and commences work on the firing chambers and throat linings for the Prototype, as the rocket had been named. He soon finds out that most of the 'technicians' working on the project are part-time enthusiasts, and meets Amelia Stuart, daughter of the chief of Western Aircraft, who, apart from being attractive, also holds numerous scientific degrees.

Studying the plans for the fuel chambers, Novak gets the idea that the Society is being financed by foreign backers and tells his suspicions to Clifton. The two of them make a report to Anheier of the A.E.C. Security Office in the local Federal Building, who seems to know more about everyone concerned in the space project than could be expected. He infers that they mind their own business.

In the evening, having spent a pleasant afternoon with Clifton and his wife Lilly at their home, Novak goes with them to a meeting of the Rocket Society where he is introduced and makes a speech. During the science fiction film which follows Cliff leaves Lilly and Novak for a few minutes. As he doesn't return Novak goes to look for him. He finds Cliff's gold ring on a basin in the washroom and is then horrified to discover a thread of crimson blood seeping under a closed toilet door.

VII.

Novak fell on his hands and knees to peer through the six-inch gap between the bottom of the door and the floor. He saw two shod feet, oddly lax, a dangling hand, a little pool of blood, and a small pistol.

He went to pieces and pounded on the door, shouting. It was latched. Novak darted from the washroom to the main hall; Anheier was there, who didn't believe there was anything to their story. He blundered into the darkness where, on the screen, two silvery space ships of the impossible future were slashing at each other with many-coloured rays that cracked and roared on the sound track.

"Anheier!" Novak yelled hysterically. "Where are you?" Dark heads turned to stare at him. Somebody stumbled his way across a row of knees and hurried to him.

"Dr. Novak?" asked the Security man. "What's the matter?" People shushed them loudly, and Anheier took Novak's arm, drawing him into the corridor.

Novak said: "There's somebody in a booth in the washroom. I saw blood. And a gun. I'm afraid it's Clifton."

Anheier hurried down the corridor without a word. In the washroom he went into an adjoining booth and climbed up on its bowl to peer over the partition.

"Bad," he said flatly, hopping down. He took a long nail file from his pocket, inserted it between the door edge and jamb and flipped up the latch. The door swung open outwards. "Don't touch anything," Anheier said.

Clifton was in the booth. His clothes were arranged. He was sprawled on the seat with his head down on his chest and his shoulders against the rear wall. There was a great hole in the back of his head, below the crown.

"Get to a phone," Anheier said. "Call the city police and report a homicide here."

Novak remembered a pay phone in the lobby downstairs and ran. Just like a magazine cartoon he crazily thought, when he found a woman talking in it on the other side of the folding glass door. He rapped on the glass imperatively and the woman turned. It was Amy Stuart. She smiled recognition, spoke another few words into the phone, and decisively hung up.

"I'm sorry to be such a gossip," she said, "but that bloody movie—"

"Thanks," he said hastily, and ducked into the phone booth. He saw Lilly coming down the stairs, looking more than a little worried.

The police switchboard took his call with glacial calm and said not to do anything, there would be a car there in less than five minutes.

Lilly and the Stuart girl were waiting outside. "Mike," Lilly burst out, "what's wrong? I sent you out to look for Cliff, you come back and holler for that A.E.C. feller, and you run to the phone. You talk straight vit' me please, Mike."

"Lilly," he said, "Cliff's dead. Shot to death. I'm——I'm sorry——"

She said something in a foreign language and fainted on his arm. Amy Stuart said sharply: "Here. Into this chair." He lugged her clumsily into a deep, leather club chair.

"Was what you said true?" she demanded angrily, doing things to Lilly's clothes.

"Quite true," he said. "There's an A.E.C. Security man there now. I was calling the police. Do you know Mrs. Clifton?"

"Fairly well. How horrible for her. They loved each other. What could have happened? *What could have happened?*" Her voice was shrill.

"Take it easy," he told her flatly. "I think you're getting hysterical and that won't do any good."

She swallowed. "Yes—I suppose I was." She fussed efficiently over Lilly for a moment or two. "That's all," she said. "Nothing else you can do for a faint. God, how horrible for her! God, how I hate killers and killing. That bloody movie. World of tomorrow. Death rays flash the life out of five hundred people aboard a ship—call them Space Pirates and it's all right. Call them Space Navy and it's all right too, as long as you kill Space Pirates to match. They're sitting up there laughing at it. What'll they think when they come out and find somebody's really dead? Who could have done it, Dr. Novak? It's unbelievable."

"I believe it. Miss Stuart, what'll we do with Mrs. Clifton? She and Cliff live alone—lived alone. Could you get a nurse _____"

"I'll take her to my place. Father has a resident doctor. I think perhaps I'd better start now. The police would want to question her. It'd be inhuman."

"I think you'd better wait, Miss Stuart. It's—homicide, after all."

"That's absurd. All they could do is badger her out of her wits with questions, and what could she have to tell them about it?"

"Look—poor little rich girl," Novak snarled, angry, nasty, and scared. "Cliff was killed and I may be killed, too, if the cops don't figure this thing out. I'm not going to handicap them by letting witnesses disappear. You just stay put, will you?"

"Coward!" she flared.

The argument was broken up by the arrival of four policemen from a radio car.

Novak said to the one with stripes on his sleeve: "I'm Dr. Michael Novak. I found a man named August Clifton in the washroom, dead. An A.E.C. Security man I know was here, so I put it in his hands. He's upstairs with Clifton now. This is Clifton's wife."

"All right," said the sergeant. "Homicide cars'll be here any minute. Wykoff, you and Martinez keep people from leaving."

Don't let 'em use that phone. Sam, come with me." He stumped up the stairs with a patrolman.

It must have been Martinez, small and flat-faced, who asked Novak: "What's going on here, anyway, Doc? Ain't this the Cheskies' place? We never have any trouble with the Cheskies."

"It's rented for the night. By the American Society for Space Flight."

"Uh," said Martinez doubtfully. "Borderline cases. Did the guy kill himself?"

"He did not!"

"Aw-*right*, Doc? You don't have to get nasty just because I asked." And Martinez, offended, joined Wykoff at the door. Novak knew he had sounded nasty, and wondered how close he was to hysteria himself.

Anheier came down the stairs slowly, preoccupied. "What's this?" he asked.

"Clifton's wife. I told her. And Miss Stuart. Mr. Anheier from the A.E.C. Security and Intelligence Office."

"Los Angeles regional agent in charge," Anheier said automatically.

"Mr. Anheier," said the girl, "can't I take Mrs. Clifton out of this? Before the other police and the reporters get here?"

"I'm not in charge," he said mildly, "but if you ask me it wouldn't be a good idea at all. Best to take our medicine and get it over with. What do you two think of Clifton's emotional stability?"

"He was brilliant, but——" Amy Stuart began, and then shut her mouth with a snap. "Are you suggesting that he took his own life?" she asked coldly. "That's quite incredible."

Anheier shrugged. "The sergeant thought so. It's for the coroner to say finally, of course."

"Look," said Novak, laboring to keep his voice reasonable. "You and I know damned well——"

"*Novak*," said Anheier. "Can I talk to you for a minute?"

Novak stared at him and they went to the foot of the stairs. The Security man said quietly: "I know what you think. You think Clifton was murdered in connection with the—stuff—you told me this afternoon."

"I think there's an espionage angle," Novak said. "And I know you had your mind made up that Clifton and I were cranks. Man, doesn't this change anything? He's *dead*!"

Anheier considered. "I'll meet you halfway," he said. "When you tell your story to the cops, keep it straight. Don't babble to reporters about your suspicions. Just leave out your opinion that Clifton was murdered. *If* there's an espionage angle, this is no time to give it to the papers."

"How does that add up to meeting me halfway?" Novak asked bitterly.

"I want to see you after tonight's fuss is over. I'll fill you in on the big picture. Meanwhile, don't prejudice our position with loose talk. Here's Homicide now. Watch yourself."

Homicide was three sedans full of photographers, detectives, and uniformed police. Reporters and press photographers were at their heels. A Lieutenant Kahn was the big wheel. Novak watched Anheier brief Kahn calmly and competently and felt a charge of resentment. The big picture—what was it? Perhaps smoothly meshing crews of agents were preparing tonight to seize members of a conspiracy ramified far beyond his small glimpse——

The lieutenant was firing orders. "Nobody, but nobody, leaves the building until I say so. You, yank that press guy out of the phone booth; that line's for us. Sergeant, make an announcement to the movie audience upstairs. Doc, bring Mrs. Clifton to and let her cry it out. I'll want to talk to her later. No reporters past the stairs for now. Where's this Novak? Come on, let's view the remains."

Now there were two white-faced A.S.F.S.F. kids in the washroom as well as the radio-car sergeant and patrolman. The sergeant saluted and said: "They came in a minute ago, lieutenant. I hold them. Didn't want a stampede."

"Good. Take them down to the lobby with a bull to watch them. Start taking your pictures, Ivy. Let's go, you fingerprint men! Where's Kelly? Dr. Novak, you found the body, didn't you? Tell us just what happened while it's still fresh in your mind." A uniformed policeman stood at Novak's elbow with an open stenographic pad.

Don't prejudice our position. Fine words; did they mean anything? Fumblingly, Novak went over it all, from Lilly's first worried request to the end. Halfway through he remembered about the ring, went through his pockets, and produced it. Through it all, Anheier's calm eyes were on him. In deference to the big picture and the unprejudiced position he said nothing about foreign powers, space-ship fuel, or espionage—and wondered if he was a fool.

The scene blended into a slow nightmare that dragged on until 1:00 a.m. Parts of the nightmare were: glaring lights from the Homicide photographers' power packs, Lilly conscious again and hysterical, Amy Stuart yelling at the police to leave her alone, Friml clutching him to ask shakily whether he thought Clifton had been embezzling, sly-eyed reporters hinting about him and Lilly, MacIlheny groaning that this would set back the A.S.F.S.F. ten years and telling his story to the police again and again and again.

Finally there was quiet. The names of A.S.F.S.F. members present had been taken and they had been sent home, kids and engineers. Amy had taken Lilly home. The police had folded their tripods, packed their fingerprint gear and gone. Last of all an ambulance whined away from the door with a canvas bag in its belly.

Left in the lobby of Slovak Sokol Hall were Novak, Anheier, and a stooped janitor grumbling to himself and turning out the building lights.

"You said you wanted to talk to me," Novak said wearily.

Anheier hesitated. "Let's have a drink. I know a bar up the street." Novak, wrung out like a dishrag, followed him from the hall. The waiting janitor pointedly clicked off the last light.

The bar was dim and quiet. Half a dozen moody beersippers were ranged on its stools. Anheier glanced at them and said: "Table okay? I have a reason."

"Sure." The Security man picked one well to the rear.

"Watch the bartender," he said softly.

"Eh?" Novak asked, startled, and got no answer. He watched. The bartender, old and fat, deliberately mopped at his bar. At last he trudged to the end of the bar, lifted the flap, plodded to their table, and said: "Yuh?"

"You got double-shot glasses?" Anheier asked.

The bartender glared at him. "Yuh."

"I want a double scotch. You got Poland Water?"

The bartender compressed his mouth and shook his head.

"I want soda with it then. Novak?"

"Same for me," Novak said.

The bartender turned and plodded back to the bar, limping a little. Novak watched him as he slowly went through the ritual of pouring. "What's all this about?" he asked.

"Watch him," Anheier said, and laughed. The bartender's head immediately swiveled up and at their table. His glare was frightening. It was murderous.

He brought them their drinks and Novak noticed that his limp had grown more marked. His fingers trembled when he set the tray down and picked up Anheier's bill.

"Keep the change," Anheier said easily, and the bartender's hand tremor grew worse. Wordlessly the man trudged from the table, rang up the sale, and resumed mopping.

"Would you mind telling me——" Novak began, picking up his double-shot glass.

"Don't drink that," Anheier said. "It may be poison."

Novak's heart bounded. This, by God, was it! Poison, spies, the papers, and Anheier was admitting he'd been right all along!

"Let's get out of here," the Security man said. He got up, leaving his own glass untouched, and they left. Novak's back crawled as he walked out behind Anheier. A thrown stiletto—a bullet——

They made it to the street, alive, and Novak waited to be filled in on the big picture while they walked: he apprehensively and Anheier with icy calm.

"I noticed that old boy come on duty while I was having a beer before the meeting," the Security man said. "He made me think of you. Paranoia. A beautifully developed persecution complex; one of these days he's going to kill somebody."

Novak stopped walking. "He's not a spy?" he asked stupidly.

"No," Anheier said with surprise. "He's a clinical exhibit, and a hell of a man to hire for a bartender. While I was finishing my beer, somebody complained about the weather and he took it as a personal insult. Two luses were lying about how much money they made. He told them to cut out the roundabout remarks; how much money he made was his business and no cheap jerks could horn in on it. You noticed the limp? We were picking on him by making him walk to the table. I laughed and he *knew* I was laughing at him. Knew I was one of his enemies plotting against him right under his nose."

"You're telling me that I have a persecution complex, Anheier? That I'm crazy?" Novak asked hoarsely.

The Security man said: "Don't put words in my mouth. I am saying you've got a fixed idea about espionage which makes no sense at all to me—and I'm a pro about espionage; you're a grass-green amateur."

"What have you *got*? A drawing that doesn't look right to you. Why the devil should it? Mysterious financial backing of the rocket club. All corporate financing is mysterious. The big boys divulge exactly as much as the law forces them to—and a lot of them try to get away with less. Every S.E.C. order issued means somebody tried just that. And Clifton got shot through the head; that's supposed to be the clincher that should convince even me. Do you think suicides don't occur?"

Automatically they were walking again and the Security man's reasonable, logical voice went on. "I didn't go to that meeting tonight to investigate your allegations; I went for laughs and to see the movie. Novak, it's always tragic to see a person acquiring a fixed idea. They never realise what's happening to them. If you try to set them right, you only succeed in giving them more 'evidence.' You know the job I have. Lord, the people I have to see! A week doesn't go by without some poor old duffer turning up and asking me to make the A.E.C. stop sending death rays through him. If they get violent we call the city police ..."

"That sounds like a threat, Anheier."

"It wasn't meant to. But I'm not surprised that you thought it did. Frankly, Novak, have you considered what your record for the past year is like? I looked you up."

Novak considered, in a cold fury. A transfer—an idiotic transfer. Unsuitable work. Hurlbut's vicious memorandum. The blowup. Affiliating with a bunch of space hounds. Superficially Anheier might look right. Inside himself he knew better.

"It won't wash," he said evenly. "You're not talking me out of anything. There's going to be an inquest on Clifton and I'm going to speak my piece."

"Better not. And this time it is a threat."

It was exhilarating. "So it's out in the open now. Good. You'll do what?"

"I want very badly to talk you out of your mistaken notion," Anheier said broodingly. "But if I can't, I've got to warn you that you're monkeying with the buzz saw. If the opposition papers get hold of your allegations, there will be hell to pay in

the A.E.C. We'll have a spy scare. Security and Intelligence will look bad. Research and Development will look bad because the headlines say another country has beaten us to the punch on rocket fuel. We'll be judged by millions not on the strength of what we do for the nation's security but on what the headlines say we don't do. And all because one Dr. Michael Novak spoke his piece. Novak, do you think we won't counter-punch?"

Novak snorted. "What could you do? I happen to be right."

The Security man gave him a pitying look and muttered: "If you smear us, we'll smear you."

Novak suddenly no longer felt exhilarated. It was a frightening word. "That's blackmail," he said angrily, but his knees had gone weak.

"Please don't put it that way." The Security man sounded genuinely pained. "You think you're right and I think you're wrong. If you want to talk to me and give me your side, okay. I'll talk to you and give you my side.

"But if you speak up at the inquest or go to the papers in any other way—we'll have to fight you in the papers. It's your choice of weapons. You can damage A.E.C. terribly with an unfounded spy scare. Naturally we'll hit back. And what can we do except try and impeach your credibility by spreading unfavourable facts about you on the record?"

In a low, embarrassed voice he went on: "Everybody's done things he's ashamed of. I know I have. I know you have. Boyhood indiscretions—adventures. Girls, traffic summonses. Friends of friends of friends who were Communists. And there were imaginative or inaccurate people who knew you slightly, maybe disliked you, and told our interviewers anything they pleased. We have a deposition in your file from a fellow you beat out on a scholarship exam. He says he saw you cheating in the examination room. Our evaluators disregarded it, but will the headline-readers? What about your inefficiency at Argonne? Your fight with Dr. Hurlbut?"

Novak was feeling ill. "If you people libel me," he said, "I can sue. And I will."

Anheier slowly shook his head. "What with?" he asked. "Who would hire the man whom the headlines called a lunatic, a pervert, a cheat, a drunkard, a radical, and heaven-knows-what-else? None of it *proved*, but—'where there's smoke there's fire,' and the 'Indefinable Something behind the Mysterious All This.'" Anheier's voice became strangely compassionate. "I mean it about the buzz saw," he said. "Surely you know of people who fought a smear and wound up in jail for perjury ..."

He did.

"All right, Anheier," Novak said softly and bitterly. "You've made up my mind for me. I was going to speak my piece at the inquest and get out of town. Now it seems I've got to do your work for you.

"A foreign power's operating under your nose and they've just murdered an American as a minor detail of a plan to bring America to its knees. So I'll keep my mouth shut and stick with the A.S.F.S.F. If I live, I'll blow this thing open. And then God help you, Anheier; I'm going to throw you to the wolves."

He walked unsteadily down a side street away from the Security man. Anheier stared after him, poker-faced.

VIII.

Afternoon of a bureaucrat.

Daniel Holland wished he were in the privacy of his office where he could swallow some soda and burp. He was lurching with the commissioners, four trenchermen, and had taken aboard too much duck with wild rice. And the commissioners were giving him hell, in a nice, extroverted way, for the slow—in fact, almost negligible—progress of A.D.M.P., the Atomic Demolition Material Program. A.D.M.P. was scheduled to provide very shortly atomic explosives that would move mountains in the American Southwest, sculpture watersheds into improved irrigation patterns, and demonstrate to a politically shaky area which elected six senators that the current Administration was the dry-farmer's guide, philosopher, and friend. In actual fact, A.D.M.P. had provided only a vast amount of dubious paper work, and some experimental results which only an insanely optimistic evaluator would describe with even so cautious a word as "promising."

The chairman of the Commission, a paunchy, battered veteran of thirty years in county, state, and national politics, told Holland gently: "Interior's pushing us hard, Dan—very hard. You know he's got the Chief's ear, of course. And it's our opinion that he's not being unreasonable. All he wants is a definite date—give or take a month—that they can start blasting in the Sierras with our stuff. He doesn't care whether the date's a month from now or a year from now, but he needs it for planning and publicity. Of course the work's got to get going before the nominating conventions, but that's absolutely the only restriction on the program. Now, what are we going to tell him?"

"I don't just now offhand, Bill," Holland grumbled. "No doubt about it, A.D.M.P.'s bogged down. I have some suggestions about getting it out of the mud, but they involve basic policy."

The first commissioner was a handsome, muscular man who had gracefully lived down the tag of "wonder boy" pinned on him when he became a university president at the age of thirty-six. He was currently on leave from the executive directorship of a great foundation dedicated to the proposition that visual education is on the beam and all else is dross. He roared jovially at the general manager: "Well, spill your guts, Dan. That's our little old job, you know. Let's canvass your suggestions informally right now. If they click we can programme them for an on-the-record session."

"You asked for it, Cap," Holland said. "First, we need—I mean *need*—about a dozen good men who happen to be teaching or working in industry around the country right now. One's a Yugoslav refugee with relations left in the old country. Another was a Young Communist League member, fairly active, in 1937 and '38. Another was once tried and acquitted on a morals charge—some little girl got mad at him and told lies. Another—well, I won't bother listing them all. You get the idea."

The second commissioner was a spare, white-headed ex-newspaper man: Pulitzer Prize, *Times* Washington Bureau chief, author, diplomatic correspondent, journalism-school dean, intimate of the great, recipient of very many honorary degrees. He shook his head more—to use a cliché that never would have appeared in his copy—in sorrow than in anger. "Now Dan," he said, "this is no time to tinker with the machinery. If there's one thing about A.E.C. that's smooth-running now, it's clearance. Congress is mostly happy—except for Hoyt's gang; the papers are happy—except for the opposition rags; and the public's got confidence in the personnel of their A.E.C. We simply can't start *that* fight all over again. What else did you have in mind?"

"Second," Holland said impassively, "we're being slowed down by declassification and down-classification. I've drummed into the boys that most material should be merely *Restricted*, *Confidential* covers most of what's left, and the *Secret* classification should be sparingly used. But they're scared, or conservative, or only human, or taking the safest way or whatever you want to blame it on. Every time I give them hell there's a little flurry of *Confidential* and *Restricted* and then the *Secret* begins to mount up again and we're back in the same old rut: boys in Los Alamos doing work that's been done in Hanford and not knowing about it. Maybe because of the limited distribution of *Secret* material. Maybe because the Los Alamos boys aren't in high enough grade for access to it. Gentlemen, I think something basic is required to correct this condition."

The third commissioner was a New York investment banker who had doubled his family fortune in ten legendary years on Wall Street and served his country for the next ten as a diplomatic trouble shooter in the Near East. He was still a formidable welterweight boxer and—to the dismay of the first commissioner—could speak Arabic, Turkish, and Court Persian. Alone on the current Commission, he had thought it his duty to master what he could of nuclear physics and its mathematical tools. Diffidently he said: "That's a tough one, Dan. But I don't see what choice we had or have. Our policy, arrived at in the best interests of the national security, is to 'classify all A.E.C. data to the extent required to prevent it from being of use to potential enemies of the United States.' It's broad, I grant you. But the demands of national security won't be satisfied with anything narrower."

"Neither will Congress," said the second commissioner.

"Neither will the voters," grunted the chairman. "Dan, we'll just have to leave that one in your lap for you to lick as an administrative problem—*within the limits of our policy*. Just a suggestion: what about setting up a special classifications-review unit charged with checking the point-of-origin classifications on new data under a directive to declassify or down classify whenever possible? You'd be able to keep a single unit here in Washington under your thumb easier than the assorted managers and directors out in the field. About how much would an outfit like that cost?"

Embarrassing moment. How to tell them that Weiss had worked on such a plan for three months and found it

impracticable? "Well, Bill, it would stand us maybe two million a year in salaries and overhead. But I see a lot of complications. The personnel in the new unit would have to be scientists or they wouldn't know what they were doing. God knows where we'd get enough of them to keep up with all the data A.E.C. grinds out—you know the scientific manpower picture. And you'd have a hell of a turnover because scientists like to do science and not paper work. And *quis custodiet?* The safest thing for them to do would still be to stamp everything *Secret*; they'll never get in trouble that way even if it does slow A.E.C. down to a crawl. I'll explore the idea and give you a report, but I think it's a policy matter."

The second commissioner said flatly: "We can't change the classifications policy, Dan. There hasn't been a spy scare worth mentioning in three years. The public's on our side. We've built up a favourable press and congressional attitude slowly and painfully and we're not going to wreck it now. Sure, we'd make a short-term gain if we published all data. But come the appropriations bill debate! Congress would cut our funds fifty per cent across the board—nail us to the cross to show us who's boss. You've got to do the best you can with what you've got, and never forget the political climate. What else did you have up your sleeve?"

Holland glanced at the chairman and looked away. Then he said slowly: "Third, something I don't understand at all has come up. A.D.M.P. was set up personnel-wise and equipment-wise to handle one ton of thorium metal a month." The chairman coughed nervously. "I learned yesterday," Holland went on, "that for two months they've been getting only .75 tons a month from Raw Materials. They thought the reduction came from me. I checked with R.M. and found that the office of the chairman ordered a monthly quota of .25 tons of thorium to the Air Force Experimental Station with a priority overriding A.D.M.P. So R.M. quite correctly diverted the A.F.E.S. quota from A.D.M.P.'s quota. I haven't checked so far on what the Air Force has been doing with our thorium." He didn't mention his anger at being by-passed, or his weary disgust at realizing that some fifteen hundred A.D.M.P. personnel had been idle as far as their primary mission was concerned for one sixth of a year because they lacked material to work with.

"Dan," said the chairman slowly, "I owe you an apology on that one. You recall how General McGovern came to bat for us at the last joint Committee hearings. Praised us to the skies for our grand co-operation, said we were all patriots, gentlemen, and scholars he was proud to work with? Half the Committee members at least are red-hot Air Force fans, so it did us a lot of good. Well, McGovern's price for that was the thorium allotment. His boys at A.F.E.S. think they can use thorium war heads in air-to-air guided missiles. The Weaponizing Advisory Committee tells me it's a lot of nonsense and furthermore A.F.E.S. hasn't got anybody who could do the work even if it were possible, so Air's not really fishing in our lake."

"Can we get their thorium quota back to A.D.M.P.?" Holland asked.

"No. I'd be afraid to try it. McGovern's been talking about a bigger quota, to serve notice on me that he's not going to be whittled down. And I live in fear that the Navy will find out about it and demand a thorium allotment of their own. That's why I was so damned secretive about it—the fewer people know about these deals, the better. Maybe we ought to have Raw Materials set up a new group to expedite thorium-ore procurement and refining—but my point was, no; the Air Force has got it and they won't let go. We've got to get along with the military, Dan. You know that. They can make us look awfully bad if they've a mind to."

"Well," said Holland, "that's that. I'll get you a report you can show Interior by tomorrow morning. Were there any other points for me?"

"Gentlemen?" asked the chairman, looking around the table. There were no other points, and the general manager left them.

The third commissioner said: "I'm a little worried about Holland. He seems to be going cynical on us."

The chairman said: "He's a little stale from overwork. He refuses to take a vacation."

"Like an embezzler," said the ex-banker, and they laughed.

"He doesn't see the big picture," said the second commissioner, and they nodded thoughtfully and got up to go their various ways:

The chairman to weigh the claims of two areas pleading to be the site of the next big A.E.C. plant;

The first commissioner to polish a magazine article on "Some Lessons of Aquinas for the Atomic Age";

The second commissioner to lobby three congressmen in connection with the appropriations bill coming up in eight months;

The third commissioner to confer with the Secretary of State on the line that State's overseas propaganda broadcasts should take concerning A.D.M.P. as proof of America's peace-loving nature.

Holland, in the privacy of his office, took four soda-mint tablets and burped luxuriously. He phoned his assistant Weiss, and passed him the job of drafting tomorrow morning's report for the Secretary of the Interior.

His "While You Were Out" pad said:

"12:15—Senator Hoyt's office called for an appointment 'as soon as possible.' Said I would call back.

"12:20—Mr. Wilson Stuart called from Los Angeles and asked you to call back today 'on the private number.'

"12:45—Senator Hoyt's office called again. Said I would call back.

"12:48—the Associated Press called asking for an interview at your convenience. I said you were occupied for the coming week and referred them to the P. & T.I. Office.

"1:15—Senator Hoyt's office called again. Said I would call back."

He sighed and knocked down an intercom button. "Charlie, tell Hoyt's people he can come right over. Get me Stuart on—no, I'll place it."

"Yes, Mr. Holland."

The general manager didn't have a phone on his desk, but he did have one in a drawer. It had a curiously thickened base, the result of some wire-pulling in A.T. & T. The curiously thickened base housed a "scrambler" of the English type which matched one in Wilson Stuart's bedroom phone. It was a fairly effective measure against wire taps. He pulled out the phone and placed the call.

His old friend must have been waiting by his own phone in the big white Beverly Hills house. "Hello?" said the voice of Wilson Stuart.

"Hello, Wilson. How is everything?"

"Let's scramble."

"All right." Holland pushed a button on the phone. "Can you hear me all right?"

"I hear you." The quality of the transmission had taken an abrupt drop—the result of Wilson Stuart's voice being torn into shreds by his scrambler, hurled in that unintelligible form across the continent, and reassembled by Holland's device.

"Dan, things are going sour out here. They're trying to take Western Air away from me—a nice little phony stockholders' revolt. One of my rats in the Oklahoma Oil crowd tipped me today. I don't know how far they've got in lining up their proxies, but it could be bad."

"What's the squawk?"

"I stand accused of running the board of directors like a railroad—which, God knows, I do, and a good thing for Western. Also, and this is the part that scares me, I'm supposed to be squandering the company's resources."

"Um. It isn't a real rank-and-file thing, is it?"

"Act your age, Dan! It's the old Bank of California programme: kick Stuart out of Western Air and integrate it with their other holdings. This time they've met Oklahoma Oil's terms."

"Who's fronting?"

"That's the only cheerful part. They've got some squirt Air Force two-star general named Reeves. He commands Great Falls A.F.B. in Montana. They've sounded him out and he's supposed to be willing to take over as board chairman after I get the boot. Such patriotism."

"I can do something about that. Know Austin?"

"I was thinking of him—he'd put the screws on the fly-boy. Will you get in touch with him?"

"Sure. Fast."

"Another thing ... I'll be in a lot stronger position for the showdown if I can pull a big, big A.E.C. contract out of my hat. What have you got?"

Holland thought for a moment. "Well, Reactor Programme's got some big orders coming up. Die-cast one-inch rods, aluminum cans, and some complicated structural members. It might all come to twenty-five million dollars. You set up for die-casting?"

"Hell no, but what's the difference? We can subcontract it to anybody who is set up. All I want is the money to show those monkeys on the board."

"You'll get it. How's Amy?"

"No complaints. She brought Clifton's widow home. Too bad about that. You never knew the guy, but he used to work for me—a real character."

"That so? Tell Amy to drop in and say hello next time she's East. I haven't seen her for months."

"I sure will, Dan. Take care of yourself. *And* the fly-boy. *And* the contract. Good-bye."

Holland hung up and put the phone back in its drawer. He said over his intercom: "Tell Fallon from Reactor Programme Procurement that I want to see him. And get me Undersecretary Austin on the phone—the Air Force Austin."

The Air Force Austin was only an acquaintance, but he had a low boiling point, and handles that stuck out a yard. There were many things that he hated, and one of them was military men who used their service careers as springboards to high-pay civilian jobs.

"Naturally I don't want to meddle in your area, Austin," Holland was telling him a minute later, "but we're all working for the same boss. Can you tell me anything about a Major General Reeves—Great Falls A.F.B.?"

Austin's suspicious New England voice said: "Supposed to be a brilliant young man. I don't know him personally. What about him?"

"I hear he's getting involved in a big-business crowd. If you want me to stop talking and forget about it, just say so."

Austin snapped: "Not at all. I'm glad you called me. What exactly did you hear?"

"The people are supposed to be Oklahoma Oil and Bank of California. The way the story went, they want to hire him as a front for the reorganization of some aircraft company or other."

"Nothing illegal? No hint of cumshaw?"

"None whatsoever. Just the usual big-salary bait."

"Glad of *that*. Thanks, Holland. If Reeves thinks he can use the Air Force, he's got a great deal to learn. I'll have this investigated very thoroughly. If you're right, he'll be A.F. Liaison officer in Guam before he knows what hit him."

Holland grimaced at the thought. It was punishing a man for exercising his freedom of contract; as a lawyer he couldn't be happy about it. Unfortunately, Austin was right too. Industry cheerfully fished the armed-forces and civil-service pond for able and underpaid executives; it had to be discouraged. Carry the process far enough and industry would hire away the best military and Government brains, leaving the nation—and itself—defended by an army of knuckleheads and administered by a bureaucracy of nincompoops ...

And of course there were other reasons for lowering the boom on Reeves.

"Mr. Fallon to see you," said his secretary.

"Send him in." Fallon was in his early thirties, but there was something about him that made him look younger to Holland. The general manager thought he could guess what it was. "Is this your first public-service job, Fallon?"

"Yes, Mr. Holland."

"What did you do before this?"

"I was with General Motors. Up in Detroit Purchasing, assistant to the department head."

"That was a good job. Why'd you leave it for us?"

He knew why. The itch you can only scratch with service, the uncomfortable feeling that they needed you, the half-conscious guilt that you owed more than your taxes. He knew why. It had ridden him all his life. Fallon tried to put it into words, and didn't succeed. There were glib hacks who could talk your ear off about it, and there were sincere guys like this who couldn't make themselves a case. "I guess I just thought I'd be happier here, Mr. Holland."

"Well. I wanted to talk to you about the upcoming contracts for breeder cans, moderator rods, and retaining-wall members. Five-nineteen, twenty, and twenty-one, I believe. Are you going to invite Western Aircraft to bid?"

Fallon was puzzled. "I'd swear they haven't got die-casting facilities on that scale, Mr. Holland. I wasn't figuring on it, but of course I'll include them if they can swing it."

"They can handle part of it as prime contractor and subcontract the rest."

"But the procurement policy is——"

"This is a special case. I want you to understand that their bid may seem high, but that they deserve very serious consideration. It's essential that we have no holdup on these castings, and I've practically decided that Western Air can do a better job of seeing them through to delivery than any other outfit that's likely to bid. They're a very able, deadline-minded outfit, and the over-all picture at this time indicates that we need their talent."

Fallon was getting upset. "But we've never had any trouble with Inland Steel or G.E., to name just two fabricators who might bid, Mr. Holland. They come through like clockwork, they know our procedure, we know the people there, they know us—it greases the ways."

"Really, Fallon, I think my suggestion was clear enough. I can't be expected to fill you in on the reasons for it. Some of them are military secrets, others are policy matters, and none of them is any particular business of yours."

Fallon looked at him, no longer wide-eyed. "Sure," he said woodenly. "How is Mr. Stuart? I hear he's a good friend of yours."

Well, this was it. The cat was clawing at the bag; the beans were about to spill. Coldly Holland channelled the fear that was exploding through him into artificial rage. He was on his feet, and his chair crashed to the floor behind him. In one stride he was towering over Fallon in the desk-side chair. Holland thrust his face almost into the face of the man from Purchasing. His voice was a low, intense growl.

"*Watch your language, son.* I've been taking a beating for twenty-eight years in public service." *Talk.* Keep him off balance, make him feel young and raw, make him ashamed, make him unhappy. "They've called me a Communist and a fascist and a bureaucrat and a bungler but they've never called me a crook. My worst enemies admit that if I wanted money I've got the brains to get it honestly. If I wanted money, I could quit A.E.C. today, open a law office tomorrow and have half a million dollars in retainers by next month."

Fallon was beginning to squirm. "I didn't——"

"Shut up. If you think you've turned up evidence of dishonesty, I'll tell you what to do. Pick up your hat and run right over to the Senate Office Building. There's a crowd there that's been trying to nail my hide to the wall ever since you were in knee pants. Maybe you've succeeded where they failed."

"I meant——"

"Shut up, Fallon. You told me what you meant. You meant that I've got nothing to show for twenty-eight years of trying to help run the purest democracy left in the world. That was news to me. I've known for a long time that I wasn't going to get rich out of the Government service. I decided long ago that I couldn't marry, because either the marriage or the work would suffer. I know I haven't got any pride left; I stand ready at any hour of the day or night to get my teeth kicked in by those county-ring Solons up on the Hill. But I thought I had the loyalty of my own kind of people. It seems I was wrong."

"Mr. Holland——"

He didn't interrupt, but the youngster didn't go on. Holland stared him down and then straightened to sit on the edge of his desk. "Go on over to the Senate Office Building, Fallon," he said quietly. "Get your name in the paper. I can stand one more kicking-around and you can use the publicity. Maybe they'll ghostwrite a series of articles for you in the Bennet rags."

But Fallon was almost blubbering. "That's not fair!" he wailed. "I tried to tell you I was sorry. I can't help it if I have an Irish temper and a big mouth. I know what your record is, Mr. Holland. It's a——it's a wonderful record." He pulled himself together and got up. "Mr. Holland," he said formally and mournfully, "I feel I should submit my resignation."

Holland slugged him on the bicep and said gruffly: "Not accepted. I could use a hundred more like you. I've got a thick hide——usually. Just that crack ... but don't let it worry you. Clear about that bid?"

"Clear at last, Mr. Holland," Fallon said with a melancholy smile. "I'll try not to make a damned fool of myself again. You have troubles enough."

When he was alone, the general manager set up the kicked-over chair, leaned back, and lit a cigarette with fingers that shook. It had been a very near thing. Lord, how long could a man be expected to keep this up? The perpetual sweat about wire tappers, loose talkers, shrewd newsmen who might put two and two together, the political opposition relentlessly stalking every hint of irregularity.

Once in T.V.A. he had turned in a friend and classmate for trying to recruit him into a footling little Communist industrial-espionage apparatus. The revelation had been shattering; his duty had seemed clear. But that had been a long time ago ...

His intercom said: "Senator Hoyt is here, Mr. Holland."

"Send him in, Charlie." He sprang from behind his desk to shake the senator's hand. "Good to see you again, Bob," he burbled cheerfully.

The senator's meaty face broke into an actor's smile. "Mighty nice of you to find time for us, Dan," he said. It was a reminder that he'd had to wait on Holland's convenience to make the appointment and a threat that some day Holland would sweat for it. The senator did not forget slights, real or imaginary.

"How're you, Mary?" asked Holland, a little dampened.

"So——so," Mary Tyrrel, the senator's secretary, said vaguely. It was odd that she was Hoyt's five-thousand-per secretary, because until last year she had been a twenty-thousand-per Washington by-liner for the Bennet newspapers. But lots of odd things happen in Washington.

"Well, Bob, what can I do for you?"

"I'm collecting a little information, Dan. Normally my investigating staff would handle it. But out of respect for your high position I thought I ought to ask you straight out myself."

Cat and mouse, thought Holland. What's he got?

The senator lit a cigar deliberately. "I like to consider myself a member of the loyal opposition," he said. "Our democracy has kept its vigour because of constant, intransigent criticism and pressure by reformers——realistic, practical reformers——against the abuses of an entrenched bureaucracy. I've been in some good scraps, Dan, and I've loved them. I fought the A.E.C. when it tried to give jobs to foreigners of doubtful loyalty. I've fought when you people tried to give

moral lepers and degenerates control of our most precious military secrets. I've fought to root out loose-tongued drunkards from the A.E.C."

"It hasn't done you any harm, Bob," Holland said.

The senator wasn't thrown off his stride. "No," he said. "It hasn't. I've enjoyed the rewards of good citizenship. I have the respect of my constituents, and on a national scale I have the backing of a great chain of patriotic newspapers. But Dan, I'm on the track of something that—God willing—will lead to the highest office in the land."

"Dewey didn't make it," Holland said.

The senator waved his cigar expansively. "He got to be governor at least. If he didn't have the imagination to make the jump to the presidency, it was his fault. Of course in his day the techniques weren't as developed as they are now. I know you take the old-fashioned, strict-construction view of politicking: work hard, improve yourself in knowledge and skill, one day you'll get the nomination on a silver platter. With all respect to you as a student of government, Dan, that theory is as dead as the Lincoln-Douglas debates.

"This is an era of high-level energy in science, industry—government. The nervous tensions under which we all live and work rules out leisurely reflection on the claims of this candidate or that. You've got to electrify people. Make them know who you are. Keep dinning your name at them so it drowns out any other candidate's name. Immerse them in your personality. Have it drummed at them twenty-four hours a day, inescapably. The standing machinery of the press and broadcasting will do it for you if you just give them a news peg to hang it on."

The senator—and his secretary—were watching him narrowly.

Holland said: "You figure you've got a news peg?"

The senator tapped cigar ash to the floor. "I might come up with one," he said. "A scandal and an investigation—the biggest ever, Dan. A blowup that will be on every tongue for a solid month. Housewives, factory hands, professional people, children—there'll be something in it for everybody. Dan! What would you think of a public servant who ignored a great discovery instead of promulgating it for the use of the people of the United States? Wouldn't it be—treason?"

"I thought you used to be a lawyer, Bob," Holland said. "It sounds like malfeasance to me."

"What if every indication was that this public servant behaved in no way different from an enemy agent, Dan?"

"Look," said Holland. "If you're going to denounce any of my A.E.C. boys for incompetence or malfeasance or moperly with intent to gawk, go ahead and do it. We've screened and processed our people to the utmost limit of practicability. You're hinting that a spy got through in spite of it. So all I can say is, that's too bad. Tell me who he is and I'll have Security and Intelligence grab him. Is that what you came to see me about?"

"Oh," the senator said mildly, "we just wanted your general reaction to the situation. Thanks for hearing me out so patiently. If anything else turns up I'll let you know."

He smiled and gave Holland a manly handshake. The general manager saw them to the door of his office, closed the door and latched it. He leaned against the oak panels with sweat popping from his brow. Somebody at Hanford had been talking to a Bennet reporter.

They didn't seem to have anything yet on the fiscal or personnel angles.

Time was getting very short.

IX.

The story on page four of Novak's morning paper said:

SPACE SHIP ENGINEER FOUND SHOT TO DEATH AT ROCKET CLUB MEET

The soaring interplanetary dreams of 146 rocket-club members turned to nightmare at Slovak Sokol Hall last night when the body of engineer August Clifton, trusted employee of the American Society for Space Flight, was

found in a washroom of the hall as a meeting of the society was in full swing on the same floor. Assistant medical examiner Harry Morales said death apparently was caused by a head wound from a single .25-calibre bullet. A Belgian automatic of that calibre was found lying near Clifton's right hand, with one shot fired according to Homicide Bureau Lieutenant C. F. Kahn.

The victim's attractive blonde wife Lilly, 35, was taken in a state of collapse to the Beverly Hills home of aircraft manufacturer Wilson Stuart by his daughter Amelia Stuart, a friend of the Cliftons and a member of the rocket club.

The club secretary, Joe Friml, 26, said Clifton had been authorized to spend "sizable" sums of club money in the course of his work, which was to build a pioneer space ship that club members hoped would go to the Moon. Friml said he did not know of any irregularities in Clifton's accounts but added that he will immediately audit club financial records for the past year with an eye to any bearing they may have on the death.

Other friends of Clifton said he was in good health but "moody" and "eccentric."

Lieutenant Kahn said he will not comment until police fingerprint and ballistics experts have analyzed the evidence. An inquest will be held Wednesday morning.

The body was discovered by Dr. Michael Novak, 30, an engineer also employed by the club, when he slipped out of the meeting room during the showing of a film. Novak immediately called in the aid of A.E.C. security agent J. W. Anheier, who was attending the meeting as a visitor. Anheier stood guard in the washroom to prevent evidence from being disturbed until police arrived. He later told reporters: "There is no security angle involved. It was just a coincidence that I happened to be there and Dr. Novak called on me."

Two one-column photographs flanked the story. One was of Amy Stuart, very society-page looking, captioned: "Socialite shelters stricken wife." The other was a view of the *Prototype*: "Dead engineer's unfinished 'moon rocket.'"

All tied up in a neat little package with a bow, Novak thought bitterly. Without saying it, the newspaper told you that Clifton had blown his brains out, probably after embezzling A.S.F.S.F. money. If you didn't know Clifton, you'd believe it of course. Why not? "They wouldn't print it if it wasn't true."

He went from the lobby newsstand to the hotel coffee shop and ordered more breakfast than he thought he could eat. But he was a detective now; he'd have to act unconcerned and unsuspecting while he was slowly gathering evidence——

Oh, what the hell.

It wasn't real. None of it had been real, for months. Assignment to Neutron Path Prediction, when he didn't know whether neutrons should take paths or four-lane super-highways. Slugging his boss, quitting his job under a cloud—research and development men didn't *act* like that. Going to work for the A.S.F.S.F., an organization as screw-ball as Clifton himself.

He wanted to laugh incredulously at the whole fable, finish his coffee, get up and walk into the job he should be holding at N.E.P.A.: a tidy salary, a tidy lab, and tidy prospects for advancement. But the climax had eclipsed even the lunacy of the past months. Somehow he had talked himself into pretending he was a detective. Detectives were hard-eyed, snap-brimmed, trench-coated, heroic. On all counts he fell down badly, Novak thought.

But a man was dead, and he thought he knew why.

And he had been threatened cold-bloodedly with a smear backed up by all A.E.C.'s prestige, and perhaps with a perjury frame-up, if he tried to get help. Novak looked helplessly at his scrambled eggs, gulped his coffee, and got up to call on the A.S.F.S.F. business office. There was a disagreeable, uncontrollable quiver in his knees.

Friml and MacIlheny were there. It was incredible that they might be spies or killers—until he remembered the bewildered, ashamed, ordinary faces of spies on the front pages of tabloid newspapers.

"Hello, Dr. Novak," the president of the A.S.F.S.F. said. "Friml and I were discussing the possibility of you taking over

Clifton's job as engineer in charge."

There was no time to stop and think of what it might mean. Friml and MacIlheny might be innocent. Or they might be guilty but not suspicious of him. There was no time. He forced surprise: "Me? Oh, I don't think so; I'll be busy enough on my own. And I don't think I could handle it anyway."

"I see you had some years of aeronautical engineering."

"Well, yes—undergraduate stuff. Still, Clifton did say there wasn't a lot of work left."

"He did that much for us," MacIlheny said bitterly. "The damned fool."

"Mr. MacIlheny!" said Friml, with every appearance of outrage.

"Yes, Mr. Friml," said the insurance man sardonically. "*De mortuis nil nisi bonum*, as you B.B.A.s and C.P.A.s put it. If he was so nuts he had to kill himself why didn't he resign first? And if he didn't have time to resign, *why* did he have to do it at a meeting? Everything happens to the poor old A.S.F.S.F. Clifton's death is going to set us back ten years in getting public recognition. And our industrial sponsors——" MacIlheny buried his head in his hands.

"I never thought he was a very stable person——" Friml began smugly.

"Oh, shut up!" MacIlheny snarled. "Just stick to your knitting. If I want your learned opinion I'll ask for it."

Novak was appalled at the naked enmity that had flared between the two men. Or the pretence of enmity? Nothing would hold still long enough to be examined. You had to keep talking, pretending. "Could I see," he asked conciliatingly, "just where we stand with respect to structural work on *Proto*?"

"Show him the cumulatives, Friml," said the president, not looking up. With his lips compressed, Friml pulled a folder from the files and handed it to Novak. It was lettered: "Engineering Cumulative Progress Reports."

Novak sat down and forced himself to concentrate on the drawings and text. After a few minutes he no longer had to force it. The papers told what was to a technical man the greatest story in the world: research and development; cool, accurate, thoughtful; bucking the cussedness of inanimate nature, bucking the inertia of industrial firms; bucking the conservatism, ignorance, and stupidity of hired hands—and getting things done. It was the story of *Prototype's* building told by the man who could tell it best, Clifton.

It started about one year ago. "Contacted Mr. Laughlin of the American Bridge Company. I don't think he believed a word I said until Friml took out the A.S.F.S.F. passbook and showed him our balance. After that, smooth sailing."

Sketches and text showed how the American Bridge Company, under Clifton's anxious, jealous eyes, executed ten-year old A.S.F.S.F. blue prints for the skeleton of *Prototype*. The tower of steel girders rose in the desert to six times the height of a man, guyed down against the wind. There was a twelve-foot skeleton tetrahedron, base down, for its foot. From the apex of the tetrahedron rose the king post, a specially fabricated compound member exactly analogous to the backbone of a vertebrate animal. It bore the main stresses of *Proto's* dead weight; it was calculated to bear the strains of *Proto* in motion; and it was hollow: through its insulated core would run the cables of *Proto's* control systems. Structural members radiated laterally from the king post to carry the weight of *Proto's* skin, and from its top sprouted girders over which the nose would be built.

Reports from Detroit: "I been going the rounds for a solid week and still no dice. If a plant's got the forming presses, its toolroom stinks. If its toolroom is okay, the superintendent won't let me barge in to stand over their die-makers and tell them what to do. But that's the way it's going to be; those hull plates are too tricky to order on an inspect-or-reject basis."

Later: "I found a good little outfit named Allen Body Company that does custom-built jobs. They got one Swedish-built forming press 40 × 40 (very good), a great toolroom with a wonderful old kraut named Eichenberg heading it up who's willing to work closely with me, and a good reputation in the trade. Told them to submit bid to Friml fast and suggest he fires back certified check without haggling. These guys are real craftsmen."

Later: "Oskar and me finished the forming and trimming dies for first tier of plates today. Twenty-four tiers of plates to go, plus actually stamping and machining them. I guess ninety days tops."

Eighty-five days later: "Mr. Gowan of the Union Pacific says he'll have a sealable freight car at the Allen siding tomorrow, but that it's out of the question for me to ride aboard with the plates. That's what he thinks. I bought my folding cot, Sterno stove and beans already."

Sketches showed what "the plates" were like: mirror-finished steel boxes, formed and machined to exact curvature. The basic size was 36" × 36" × 6", with some larger or smaller to fit. The outer, convex wall of the box was of three-quarter-inch steel; the inner, concave wall was one-inch armour plate. Each box was open along one of its narrow 6" × 36" faces, and each was stuffed with compressed steel wool—the best shock absorber A.S.F.S.F. brains had devised to slow down and stop a pebble-sized meteorite if one should punch through the outer shell. There were six hundred and twenty-five of the plates, each numbered and wrapped in cotton wool like the jewel it was.

Three days later Clifton arrived aboard his freight car in the Barstow yards. When a twenty-four-hour guard of A.S.F.S.F. volunteers was mounted over the freight car, he located a trucking company that specialized in fine furniture removals. "Not a scratch and not a hitch. We got them stacked in order under the tarps at the field. I think it will be okay to use some volunteers on the welding. I checked with the Structural Ironworkers, the Shipbuilders, and the Regional C.I.O. people. It seems nobody has union jurisdiction on building space ships, so Regional said we could use unpaid helpers so long as they don't touch the welding torches while they're hot. Tomorrow I go down to the shipyards to get myself the six best damn master welders on the Coast. I figure on letting them practice two—three days at beadless welding on scrap before I let them start tacking *Proto's* hide on. Meanwhile I rent a gantry crane. It'll make a better platform for the welders than scaffolding and cut down your chance of spoilage. Also we'll need one later when we come to installing heavy equipment."

He got his master welders and his gantry crane. Two of the welders grinned behind their hands, refusing to follow his rigid specifications on the practice work; he fired them and got two more. The fired welders put in a beef with the union and the others had to down their torches. Clifton lost a day. "I went down to the hall and gave the pie cards hell. I brought some of the junk those two bums did and I threw it on their desks and they said they'd kill the beef and let them know if there's any more trouble, which I don't think there will be with the new boys."

There wasn't. The first tier of plates went on, and fitted to a thousandth of an inch. Volunteer kids working at the field were horrified to see the latticework skeleton of the *Prototype* sag under their weight, and Clifton told them it was all provided for down to the last hairsbreadth of sag.

As the shining skin of *Proto* rose from the ground in yard-high tiers, the designers of the A.S.F.S.F. passed through the acid test and came out pure gold. Nameless aero-engineers, some long gone from the Society and some still with it, engineering professors and students at U.C.L.A., Cal Tech and Stanford, girl volunteers punching calculators in batteries, had done their job. The great equation balanced. Strength of materials, form of members, distributed stresses and strains, elasticities and compressibilities added and equaled one complete hull: a shinningly perfect bomb shape that could take escape velocity. Six plates equally spaced around the eleventh tier and one plate in the eighth tier were not welded in. The six were to be fitted with deadlights and the one with a manhole.

The welders crawled through the eighth-tier hole for their last job: two bulkheads which would cut the ship into three sections. The first cut off *Proto's* nose at the ninth tier. It was the floor of her combined living quarters and control room—a cramped, pointed dome some ten feet in diameter and twelve feet high at the peak. From this floor protruded the top of the king post, like a sawed-off tree stump sprouting girders that supported the nose. The second bulkhead cut *Proto* at the seventh tier. It made a cylindrical compartment aft of the control room that could store five hundred cubic feet of food, water, and oxygen. This compartment also doubled as the airlock. The outside manhole would open into it, and from it a second manhole would open into the control room above.

Aft of the bulkhead was two-thirds of the ship—an empty shell except for structural members radiating from the king post. It was reserved territory; reserved for a power plant. The stiff paper rattled in Novak's hands for a moment before he could manage them. He had almost been lost in cool, adult satisfaction, as he followed the great engineering story, when fear struck through. This triumph—whose? MacIlheny and Friml glanced briefly at him, and he sank into the reports again.

"Sorry to say ... repeated twelve times ... seems conclusive ... obviously a bonehead play ... some of the new silicones may ... deadlight gaskets ..." Novak's heart beat slower and calmer, and the words began to arrange themselves into sense. Clifton's report on the six planned deadlights was negative. Vacuum-chamber tests of the proposed gasketing

system showed that air leakage would be prohibitive. There simply wasn't a good enough glass-to-metal seal. The ring of deadlights was *out*, but a single deadlight in the nose was indispensable. Air leakage from the nose deadlight was cut to an almost bearable minimum by redesigning the assembly with great, ungainly silicone gaskets.

This meant blind uncertainty for any theoretical occupants of *Proto* during a theoretical ascent. The nose deadlight, an eighteen-inch optical flat at the very tip of the craft, was to be covered during the ascent by an "aerodynamic nose" of sheet metal. In space the false nose would be jettisoned by a power charge.

The next series of reports showed Clifton in his glory—control devices, his specialty.

In one month, working sometimes within A.S.F.S.F. specifications and quite often cheerfully overstepping them, he installed: an electric generator, manhole motors, lighting and heating systems, oxygen control, aerodynamic nose jettison, jato igniters, jato jettison, throat vane servos (manual), throat vane servos (automatic, regulated by a battery of fluid-damped plumb bobs). Controls for these systems were sunk into the head of the king post that jutted from the control-room floor. There was nothing resembling a driver's seat with a console of instruments and controls.

And there were two other control systems indicated in the drawings. At the input end they had provisions for continuous variation of voltage from zero to six, the power plant's maximum. At the output end there was—nothing. The two systems came to dead ends in *Proto's* backbone, one at the third tier and one at the fifth.

Novak had a short struggle with himself. Play dumb, or ask about it? They say they think you're smart enough to take over ... He asked.

"Fuel-metering systems," MacIlheny said. "We assumed of course that something of the sort would be needed eventually, so we had Clifton put in dead-end circuits."

"I see."

He was nearing the end of the sheets. The last report said acceleration-couch tests were proceeding satisfactorily with no modifications yet indicated. And then the folder came to an end.

"I think," Novak said slowly, "that I can handle it after all. He's just about finished the job—as far as any private outfit can take it."

MacIlheny looked up and said evenly: "There's some more construction work to be done—on the same basis as the dead-end control systems. Naturally there's got to be a fuel tank, so we're going to put one in. Here's the drawings——" He had them ready in a blue-print file.

It was another of the "J. MacI" jobs, with the same date as the too-specific drawings for the throat liner and chamber. Novak wondered crazily whether MacIlheny or Friml had a gun in his pocket, whether the wrong reaction meant he'd be shot down on the spot. He studied the sheet and decided on his role. The "fuel tank" was a fantastic thing. It filled almost the rear two-thirds of the Prototype and made no sense whatever.

There was one section forward that consisted of stainless steel. A section aft, much smaller, was quartz-lined lead, with a concrete jacket. Atomic. There was a lead wall indicated between the stainless-steel tank and the *Proto's* aft bulkhead. Atomic. This was a tank for a fuel that burned with atomic fire.

He told them, businesslike: "It's going to cost a hell of a lot of money but that's your business. I can install it. Just don't blame me if it has to be ripped out again when A.E.C. comes out with an atomic fuel that doesn't fit it."

MacIlheny said into the air, slowly and with burning emphasis: "*Can't* people understand that *Proto's* not a moon ship? *Can't* they get it through their heads that she's just a dummy to study construction problems? What the hell difference does it make if the fuel A.E.C. comes up with doesn't fit her system? All we're after is the experience we'll need to build a system that does fit."

Novak said hastily: "Of course you're right." Lord, but MacIlheny was convincing! "But it gets a grip on you. Half the kids think it's a moon ship——"

"All right for kids," said MacIlheny grimly. "But we're all adults here. I'm sick of being ribbed for doing something I'm not doing at all. Good—and—sick." He stared at the engineer challengingly, and then his grimness vanished as he added:

"I wish it *was* a moon ship, Novak. I wish it very much. But——" He shrugged.

"Well," said Novak uncertainly, "maybe I'll feel that way about it after a year or so of the ribbing. By the way, can you tell me where Miss Stuart lives? I ought to go and see Mrs. Clifton if I can be spared today, and I suppose things are still in a state of flux."

"Thirty-seven twenty-four Rochedale," said Friml, and he jotted it down.

"I suppose it's all right," said MacIlheny. "God, what a headache. Just when things were going smoothly. Suppose you check in tomorrow morning and we may have some plans made for you."

"Won't the membership have to——"

"The membership," said MacIlheny impatiently, "will do as it's told."

X.

Novak thought he should phone the Wilson Stuart residence before he tried to pay a call. He couldn't find the number in the book and naively asked Information. Information sharply told him that the number was unlisted.

Well, he tried.

He got a downtown cab and enjoyed a long ride into the rolling country lying north of Los Angeles. "Pretty classy," he said.

"I should know?" asked the cabby blandly, and added in a mutter something that sounded like: "Stinking rich."

A mile farther on, the cab stopped. "Check point," the driver said. Novak saw a roadside booth, all chrome and glass, with two cops in beautifully fitting uniforms. One of them came out to the car, the driver gave him the address, and they rolled on.

"What was that about?" Novak asked.

"A trifling violation of our civil liberties," the cabby said. "Nothing to get upset about. At night, now, they take your name, and phone on ahead if they don't know you."

"California!"

"All over," the cabby corrected him. "Grosse Pointe, Mobile, Sun Valley—all over. I guess this is it."

Thirty-seven twenty-four Rochedale was extreme California modern: a great white albatross of a house that spread its wings over a hilltop. "Well, go on up the driveway," Novak said.

"Nope. If you had any business with folks like that you'd have your own limousine. *You* go in and get arrested for trespassing. These people don't fool around." He turned down the meter flag and Novak paid him.

"I hope you're wrong," the engineer said, adding a half dollar. He started up the driveway.

It was a confusing house. He couldn't seem to find a place where it began, or a doorbell to ring. Before he knew it, he seemed to be inside the Stuart home, unannounced, after walking through a row of pylons into a patio—or was it a living room? They didn't build like that in Brooklyn or Urbana.

A shock-haired old man rolled into the living room—or patio—in a wheel chair pushed by a burly, Irish-looking fellow in a chauffeur's dark uniform. "I'm sorry," Novak exploded jumpily. "I couldn't find——"

"Who the devil are you?" demanded the old man, and the chauffeur took his hands from the chair, standing exactly like a boxer about to put up his fists.

"My name's Novak. I'm a friend of Mrs. Clifton's. I understand she's here—if this is the Wilson Stuart residence."

"I'm Wilson Stuart. Do you know my daughter?"

"We've met."

"I suppose that means she didn't invite you. Did she give you the address?"

"No—she's a member of the A.S.F.S.F., the space-flight society. I got it from the secretary."

The old man swore. "Keep it to yourself. A person has no damned privacy in one of these places and I can't build a wall because of the zoning laws or covenants or whatever they are. Grady, get Miss Amelia." The chauffeur gave Novak a no-funny-business look and left.

"Uh, how is Mrs. Clifton?" Novak asked.

"I don't know; I haven't seen her. I'm not surprised by any of this, though. I thought Clifton's mind was giving way when he took that job with the rocket cranks. Not that I'd keep him on my pay roll. He told my V.P. for Engineering that he didn't know enough to build an outhouse on wheels. That tore it." The old man chuckled. "He could really ram things through, though. Didn't give a damn whose floor space he muscled in on, whose men he gave orders to, whose material he swiped for his own projects. Where are they going to find another lunatic like that to build their rocket?"

"I'm taking it over, Mr. Stuart." What a callous old beast he was!

"You are? Well, be sure you have nothing to lose, Novak. What are they paying you?"

"Rather not say."

It made Wilson Stuart angry. "Well, isn't that too bad! I can tell you one thing. Whatever it is, you're putting a blot on your record that no responsible firm can afford to ignore." He spun the chair to present his back to Novak and scowled through the pylons that formed one wall of the ambiguous room.

Novak was startled by the burst of rage, and resentful. But you didn't tell off a cardiac patient at will—or a multi-millionaire.

The chauffeur and Amy Stuart came in. "Hello, Dr. Novak," she said. The old man silently beckoned over his shoulder to the chauffeur and was wheeled out.

"How's Mrs. Clifton?" Novak asked.

"Father's doctor says she should rest for a day or two. He's given her some sedatives. After that—I don't know. She's talking about going back to her family in Denmark."

"May I see her?"

"I think so. Dr. Morris didn't say anything about it, but it should do her good. Come this way."

Crossing large, glass-walled rooms he said: "I don't think I should have come at all. Your father was upset by my knowing the address. Mr. Friml gave it to me."

"Mr. Friml should have known better," she said coolly. "My father has no reserves of energy for anything beyond his business and necessary recreation. It's cruel discipline for him ... he's held speed and altitude records, you know."

Novak uttered a respectful mumble.

The girl asked: "What are they going to do about a replacement for Cliff?"

"I think I get the job. I've done some aero-engineering and there's very little structural work left to be done. I suppose if there's anything I simply can't handle, they'll hire a consultant. But I can probably swing the load."

"You can if you're checked out by MacIlheny. The man's a——" She started to say "fanatic" and then interrupted herself. "That's the wrong word. I admire him, really. He's like—not Columbus. Prince Henry the Navigator of Portugal. Henry stuck close to his desk and never went to sea, but he raised the money and did the paperwork."

"Um. Yes. Has Lilly—Mrs. Clifton—been asking for a biomathematicist, I wonder? She has such faith in them that it might do her good at a time like this, when it's a matter of psychological strain."

The girl looked startled. "That's very odd," she said. "As a matter of fact she hasn't. I suppose recreations like that show up in their true light when the pressure is on. Not that it would do her any good to ask for one. Dr. Morris would break the neck of any biomathematicist who showed up here."

She pushed open a flush door of blonde wood and Novak saw Clifton's widow in the middle of a great modern bed with sickroom paraphernalia on a side table. "Visitor, Lilly," Amy Stuart said.

"Hallo, Mike. It was good of you to come. Amy, you mind if I speak alone vit' Mike?"

"Not at all."

"Sit down," she said with an unhappy smile as the girl closed the door. "Mike, what's gonna happen now? You don't think Cliff kill himself, do you?" She was fighting back tears with a heartbreaking effort. "He act cra-a-azy. But that was just because he enjoy life and didn't give a damn for nobody. He wasn't no crazy man to kill himself, was he, Mike?"

"No, Lilly," Novak said. "I don't think he killed himself." And he bit his lip for saying it. The woman was under sedation, she might babble anything to anybody——

"Mike," she said, "I'm glad you say so." She sniffed and dried her brimming eyes, as a child would do, on the hem of her bed sheet.

"How're you fixed for money, Lilly?" he asked. "I thought you might need a little ready cash for——expenses and things."

"T'anks, Mike, no need. We had a joint bank account vit' couple t'ousand dollars in. Mike, honestly you don't believe Cliff kill himself?"

He thought it over. "Have you taken any medicine?"

"Last night the doc gave me couple pink pills and he tol' me to take couple more today—but I don't. You know I don't t'ink much of doctors."

"I don't want to tell you what I think about Cliff's death if you're full of medicine or if you're going to be. You might talk to somebody about what I tell you. It might mean my life too." It was her business, he told himself silently.

After a stupefied pause, Lilly slowly asked: "Please tell me all about it, Mike. Who'd kill Cliff? Who'd kill you? Those few crazy kids in the Society, they don't like Cliff ever, but they wouldn't kill him. You tell me what it's all about, Mike. Even if somebody tear the eyes out of my head I don't talk."

He pulled his chair to the bedside and lowered his voice. "Yesterday Cliff and I thought we found something fishy about one of the A.S.F.S.F. blue prints. I thought it meant that a foreign country was using the Society to build it a rocket ship. Maybe with Friml or MacIlheny or both fronting, and nobody else in on it. We went to the A.E.C. Security office downtown and saw that man Anheier. He brushed us off—didn't believe a word of it. Last night Cliff got killed and it looked like suicide. But it could have been murder by anybody who could have sneaked into the washroom when he was there—and that's anybody off the street and practically anybody who was at the meeting.

"I don't know how—whoever did it—got wise to his visit to Security or why nobody's taken a shot at me that I know of. Maybe spies keep a twenty-four-hour watch on the Security office to see who visits it. Maybe Cliff's visit was the signal for his death. Maybe I wasn't identified because I'm new in town.

"But none of that matters right now. What matters is that Anheier wouldn't let me tell the police about my idea. He tried to convince me that I was a paranoid. When that didn't work, he threatened to ruin me for life and jail me for perjury if I talk, now or ever."

"You not gonna tell the po-lice, Mike?"

"No, I'm afraid of the smear and—it probably wouldn't do any good. The A.E.C. would make countercharges and any foreign agents would escape in the fuss. I told Anheier the hell with him, I'd nail them alone."

"No," she said, pale-faced. "Not alone, Mike. Vit' me."

"Thanks, Lilly," he said softly, and she was crying at last.

"Don' mind me," she said. "T'anks for coming to see me and now you please go. I cry better by myself ..."

He left in silence. She was with him—it felt better. The morning with MacIlheny and Friml, every question a step on a tightrope over the abyss, had told on him.

Amy Stuart laid down a magazine and got up from a blocky chair. "How is she, Dr. Novak?"

"I'm afraid I made her cry."

"It's good for a woman to cry at a time like this. Have you a car?"

"No; I came in a taxi. If I could phone for one——"

"You're downtown, aren't you? I'll drive you; I have some shopping."

Her car was a two-seater English sports job. It looked like a toy in the garage between the big Lincoln and a suburban wagon.

As they went winding through the scrubbed-clean roads he broke the silence. "To me it's just an interesting job, you know. I'm not a Prince Henry like MacIlheny is and maybe Cliff was. Or—what was her name? The girl who raised sand at the meeting. The one you stepped on."

"Gingrich?" Amy Stuart said dispassionately. "She's not particularly interested in space flight and she's a bloody fool besides. If Gingrich and her friends had their way, there'd be a full-dress membership vote by secret ballot on where to put each rivet in the *Prototype*."

The little two-seater rolled past the police sentry box and Amy Stuart waved pleasantly to the two policemen. They saluted with broad smiles and Novak abandoned himself to bitter thoughts for a moment.

"Jeffersonians, they think they are," the girl brooded. "But wouldn't Jefferson be the first man to admit that things have changed since his day? That there's a need for something beyond sheer self-regulating agrarian democracy?" The question was put with an intensity that startled him. It was overlaid with a portentous air that made him think of nothing so much as a doctor's oral where, literally, your career is made or unmade by a few score words spoken in a minute or two. What was the girl driving at.

"People are always accusing engineers of not thinking about social problems," he said carefully. "In my case, I'm afraid they're right. I've been a busy man for a long time. But I wonder—are you by any chance flirting with fascism or Communism?"

"No," she said scornfully, and fell silent.

It was some minutes before she spoke again. "You were in A.E.C. Did you ever read anything by Daniel Holland? He's a friend of father's. And mine."

There was something he could talk about. "I didn't know he wrote, but your friend runs a hell of a silly organization. You know what my field is. Believe me or not, but I swear I was transferred out of it and into a highly specialized branch of mathematical physics. I was absolutely helpless, I was absolutely unable to get back to my own work. Finally I—I had to resign."

She said patiently: "That's exactly the sort of thing Holland fights. In his books he analyzed the warped growth of modern public administration under the influence of the Jeffersonian and Jacksonian mistrust of professionals. He calls it the 'cincinnatus complex.'"

He recognized the allusion and felt pleased about it. Cincinnatus was the Roman citizen who left his plowing to lead the army to victory and then returned to his plow, turning down glory and rewards. "Interesting concept," he said. "What does he suggest?"

The girl frowned. "If you'd thought about it, you'd know that's damn-all he could suggest. His books were only analytical and exploratory, and he nearly got booted out of public service for daring to raise the problem—challenging the whole structure of bureaucracy. He thought he could do more good in than out, so he stopped publishing. But he'd stepped on

some toes. In *Red Tape Empires* he cited a case from the Nevada civil service. The Senator from Nevada on the joint A.E.C. Committee badgered him from then on. Wonderful irony. He was a master of all the parliamentary tricks that were originally supposed to carry out the majority will without infringing on minority rights."

He was worried about Lilly and getting shot and future long, precarious talks with MacIlheny. "I suppose," he said absently, "you're bound to have a rotten apple in every barrel."

Amy Stuart said flatly but emphatically, with her eyes on the road: "You scientists deserve exactly what you got." And she said nothing more until she dropped him off at his hotel and proceeded to her shopping. Novak had a queasy, unreal feeling that he'd just failed his doctor's oral.

XI.

The high-temperature lab was built, and its equipment installed by the able construction firm that had done the field layout. During this time Novak worked on the manhole problem, and licked it. Studebaker *had* ungreased its titanic boring mill and for a price had cheerfully put a super finish on the manhole and its seating. In an agony of nervousness for the two priceless chunks of metal, Novak had clocked their slow progress by freight car across the country from South Bend to Barstow.

It was one of those moments when Lilly Clifton or Amy Stuart was helpfully by his side, and this time it happened to be Amy. They stood outside the machine-shop prefab, squinting into the glare of the *Prototype's* steel skin, and at an intenser, bluer glare that was being juggled by a hooded welder on the gantry-crane platform, twenty feet up. The manhole cover and seating assembly were being beadlessly welded into the gap in the ninth tier of plates. It was a moment of emotional importance. *Proto* externally was an unbroken whole.

Novak's pulse pounded at the thought, while the matter-of-fact welder up there drew his hell-hot point of flame like an artist's brush along the gleaming metal. The engineer couldn't be matter-of-fact about it any more. He had plunged into the top-boss job at the Barstow field determined to give a realistic imitation of a space hound, and had become one.

There was no reason not to. In theory, he told himself, he was waiting for a break but one never came. There were no further irregularities beyond the four on which he had committed himself: money, secrecy, the "J. MacI." drawings, and the death of Clifton.

MacIlheny never offered any surprises. He was an insurance man and a space-flight crank. He had cloudy industrial contributors in his pocket and he used them as a club to run the Society his way. His way was to get *Proto* built as a symbol and rallying point for those who demanded a frontal smash by the Government into the space-flight problem instead of the rudimentary, unco-ordinated, and unimaginative efforts that were all the United States could show, for whatever reason.

Friml continued to be—Friml. Bloodless, righteous, dollar-honest, hired-hand, party-of-the-second-partish Friml. A reader of the fine print, a dweller in the Y.M.C.A., a martyr to constipation, a wearer of small-figured neckties which he tied in small, hard knots.

The engineer members of the A.S.F.S.F. continued to be hobbyists, hard to tell one from the other, showing up on weekends, often with the wife and kid, for an hour or so of good shop-talk and connoisseurs' appreciation of *Proto* as the big, handsome jigsaw puzzle that she was—to them.

The A.S.F.S.F. youngsters continued to be hagridden kids escaping from humdrum jobs, unhappy families, or simply the private hell of adolescence by actually helping to pay for and work on and dream over *Proto*. Some day it would carry them on wings of flame to adventurous stars where they'd be all broad-shouldered males six feet tall or slim but luscious girls with naturally curly hair. They worked like dogs for the new engineer in charge and didn't even ask for a dog's pat on the head; all they wanted was to be near enough to *Proto* to dream. They fought ferociously with words on occasion over this detail or that, and Novak eventually realized that their quarrels symbolized a fiercer squabble they hoped was coming over the passenger list of man's first moon ship.

Novak stood comfortably midway between the engineers and the kids—he hoped. *Proto* was big medicine. The dream of flight which has filled the night lives of countless neurotics since, probably, the Eolithic era, had been no dream since

the balloons of Montgolfier. This new wish fulfillment of space flight had been for fifty years standard equipment on your brilliant but dreamy youngster. It soaked into you from earliest childhood that some day—not quite in your time, but some day—man would reach the planets and then the stars. Being around *Proto*, putting your hands on her, tinkering with her equipment, smelling her hot metal in the desert sun, hearing her plates sing as they contracted in the desert-night chill, did something to you, and to the "some day" reservation about space flight. Novak had become a true believer, and with each passing week wondered more feverishly what in hell's name he was doing: building a moon ship for China? Running up dummy? Or just honest engineering? Each week he told himself more feverishly: one week more; just get the manhole licked, or the silicone gaskets, or the boron carbides.

The blue, hard twinkle of the welding torch twenty feet up snapped off; the welder shoved back his hood and waved genially. The platform of the gantry crane descended.

"That does it," Novak said hazily to Amy. He lit a cigarette. "You want to push the button?"

"If it doesn't work, don't blame me," she said. There was a six-volt line run from the machine shop into *Proto's* sewerpipe stern and up through the king post to feed the electric systems. She snapped the control for the manhole motor to open, and they stared up again. The dark disk against the shiny steel plate developed a mirror-bright streak of microfinish bearing surface along one edge. Noiselessly and very slowly the wire-fine streak grew to a new moon; the manhole slowly stood out in profile and halted, a grotesque ear protruding from the ship.

"Okay, Amy. Close it." She snapped the switch to *Shut*, and very slowly the disk swung back and made *Proto* an unbroken whole again. The welder stepped from the gantry platform and asked: "She all right, Mr. Novak?"

"Fine, Sam. Fine. Was there any trouble fitting the lug into the receptacle?"

"Nope. Only one way to do it, so I did it. It surely is a fine piece of machinery. I used to work at the Bullard Works in Hartford and they didn't make their custom-built machine tools any prettier than your—thing. Confidentially, Mr. Novak, is——"

He held up his hand protestingly. "It's a full-scale mock-up for structural study and publicity purposes. Does that answer the question, Sam?"

The welder grinned. "You people are really going to try it, aren't you? Just don't count on me for a passenger is all I ask. It's pretty, but it won't work."

As they walked to Novak's refractory lab, Amy said: "I worry about everything Cliff installed, like the manhole motor, until it's tested. I know that verdict, 'while of unsound mind' and so on is just legal mumbo jumbo, but ... why should the manhole have opened that slowly? It was like a movie, milking it for suspense."

He glanced at her. "Perfectly good reasons. It runs on a worm gear—low speed, power to spare. The motor has to open it against the molecular cohesion of the biggest gauge-block seal ever machined. In space or on the Moon the motor would get an assist from atmospheric pressure in the storeroom, pushing against zero pressure outside."

She laughed. "Of course. I suppose I was being jittery. And there's sometimes melodramatic suspense in real life, too, I suppose."

He cleared his throat. "I've got Lilly in there aging a new boron-carbide series. Want to watch? You can learn enough in a few hours to take some routine off my neck. The volunteer kids are fine and dandy, but they mostly have jobs and school hours. What I need is a few more people like you and Lilly that don't have to watch the clock."

"It must be very handy," she agreed abstractedly. "But you'll have to excuse me. I'm due back in town."

Novak stared after her, wondering what was biting the girl. And he went on into his lab.

It was the dream layout he had sketched not too long ago, turned real by the funds of the A.S.F.S.F. Lilly was in the cooling department clocking temperature drops on six crucibles that contained boron carbides in various proportions. She was looking flushed and happy as she sidled down the bench on which the crucibles were ranged, jotting down the time from the lab clock and temperatures from the thermocouple pyrometers plugged into each sample. Her blonde hair was loose on her creamy neck and shoulders; she wore shorts and a blouse that were appropriate to the heat of the

refractories lab but intensely distracting. She turned and smiled, and Novak was distracted to the point of wondering whether she was wearing a brassière. He rather doubted it.

"What are the temperatures now?" he asked.

She read off efficiently: "Seventy-two, seventy-four, seventy-eight, seventy eight point five, seventy eight point five, seventy-nine."

The leveling was unexpected good news. "Interesting. Are you afraid to handle hot stuff?"

"Naw!" she said with a grin. "Yust not vit' my bare hands."

"Okay; we'll let you use tongs. I want you to take the lid off each crucible as I indicate. I'll slap the ingot in the hydraulic press, crush it, and give you the dial reading. Then I'll put it in the furnace. After all the ingots are crushed and in the furnace I'll turn on the heat and watch through the peephole. When they melt I'll call out the number to you, and you note the temperature from the furnace thermocouple. Got it?"

"I t'ink so, Mike."

It went smoothly. The ingots were transferred safely, they crushed under satisfactorily high pressure, and the furnace flashed red and then white in less than five minutes. Staring through the blue glass peephole at the six piles of glowing dust, waiting for them to shimmer, coalesce, and run into liquid, was hypnotically soothing—except that he could sense Lilly at his side, with her eyes on the thermocouple pyrometer and her full hips near him, giving him thoughts that he found alarming.

He stared at the cones of glowing dust and thought bitterly: *I don't want to get any more mixed up in this than I am now*. One of the glowing piles shimmered and looked mirrorlike. Abruptly it shrank from a heap of dust into a cluster of little globes like an ornamental pile of Civil War cannon balls and an instant later slumped into a puddle.

"Number five!" he snapped.

"Got it, Mike," she said, and her thigh touched him.

This thing's been coming on for a couple of weeks. I'll be damned if I don't think she's giving me the business. She ought to be ashamed. But what a shape on her. Amy wouldn't pull a stunt like this. He felt a little regretful and hastily clamped down on that train of thought. "Number three!"

"Got it."

Minutes later he was at his desk with the figures, and she was an interested spectator. He explained laboriously: "The trick is to reduce your unknowns to a manageable number. We have mixing point of the original solution, rate of cooling, final temperature, and melting point. You call them T_1 , dT/dt —that's derivative of temperature with respect to time— T_2 and T_3 . Do you follow it so far?"

She leaned over his shoulder and began: "I don' see——"

"The hell with it," he said, and kissed her. She responded electrically, and in her candid way indicated that she meant business. The faint voice of Novak's conscience became inaudible at that point, and the business might have been transacted then and there if the lab door hadn't opened.

Hastily she pulled away from him. "You go see what is, Mike," she ordered breathlessly.

"Fine thing," he growled, and slapped her almost viciously on the rump.

"I know how you feel, boy," she grinned.

"Oh—no—you—don't." He cleared his throat and stalked out from the small private office into the lab. One of the machine-shop kids was waiting. The boy wanted to know whether he should use hot-roll or cold-roll steel for the threaded studs of the acceleration couches; the drawings just said "mild steel." Novak said restrainedly that he didn't think it made any difference, and stood waiting for him to leave.

When he got back to the private office Lilly was putting her face on. She said hastily: "No, Mike. Keep the hands off me for a minute while I tell you. This is no place. You wanna come to my house tonight, we do this t'ing right."

"I'll be there," he said a little thoughtfully. Conscience was making a very slight comeback. He hadn't been to the Clifton house since the day of the murder. But the lady was willing, the husband was six feet under, and it concerned nobody else.

"Good boy. You go back to work now."

He watched her drive from the field in the big maroon Rolls and tried to buckle down. He got nothing done for the rest of the afternoon. He tried first to set up matrix equations to relate the characteristics of the six boron carbides and committed howler after howler. He decided he'd better lay off the math until he was feeling more placid. In the machine shop he took over from an uncertain volunteer who was having trouble threading the acceleration-couch studs. Novak, with a single twitch of the lathe's cross-feed wheel, made scrap out of the job.

It wasn't his day. Among the condolences of the machine-shop gang he declared work over and bummed a ride back to Los Angeles in one of the kids' jalopies.

He bolted a meal in the hotel dining room and went upstairs to shower and shave. Not until he was dressed and down in the lobby did he realize that he didn't remember the Clifton address—if he had ever heard it. Cahunga, Cahuenga Canyon, something like that, and he could probably find the house from a taxi window. He went to the phone book to look up Clifton, and found nothing under August. There were three A. Cliftons with middle initials, but none of them lived on anything that sounded like Cahunga, Cahuenga, or whatever it was. He tried Information and got the standard Los Angeles answer—unlisted number. A girl waiting outside the half-opened door of the phone booth turned red and walked away after overhearing part of his comments on that.

Now what the devil did you do? He recalled suddenly that Friml was good on addresses, just the way you'd expect his card-file type to be. He looked up the Downtown Y.M.C.A. and was connected with Friml's room.

"This is Novak, Friml. I hate to bother you after hours, but I wonder if you can give me Clifton's address. I, um, need it for some reports and he isn't in the phone book."

The secretary-treasurer's precise voice said: "Just one moment, Mr. Novak. I have it in a memorandum book. Please hold the line."

Novak held on for some time and then Friml gave him the address and—unsolicited—the phone number. He jotted them down and said: "Thanks. Sorry to be such a nuisance."

Friml said with a martyred air: "Not at all. I'm not good at remembering numbers myself." There was a plain implication of: "So why the hell don't you keep a memorandum book like good little me?"

Mildly surprised at the admission, Novak thanked him again and hung up. Now for a taxi. Walking up the street to a stand where he could climb in without having to tip a doorman, he wondered how he'd got the notion that Friml kept his address book in his head. Probably just the type of guy he was made you think so. Probably he did nothing to discourage you from thinking so. Probably there was a lot of bluff behind any of these ice-water types ...

And then he stopped still in the street, realizing what had made him think Friml was a walking address book. He'd asked once for the Wilson Stuart address, and the secretary-treasurer had rolled it out absently as if it were no great feat to recall offhand where a rank-and-filer of the Society lived. He started walking again, slower and slower.

There was something very wrong. Friml had memorized the Wilson Stuart address, presumably of negligible importance to him. All he could possibly have to do with the Wilson Stuart address was to send a bill for annual dues, meeting notices, the club bulletin—no not even that. All those items were addressographed. Friml had not memorized the August Clifton address or phone number, although presumably he'd be constantly dropping notes and making calls to him for engineering data. If he didn't know the Clifton number and address offhand he was decidedly no good at numbers, as he admitted.

Novak walked slowly past the cab rank and crossed the street. Stepping up to the curb, his right heel caught in the unfamiliar sag of his trouser cuff, and he thought: damn that belt.

It was, clearly, the first break in the Clifton killing. Friml wasn't what he seemed to be. Clearly there was a link of some sort between the secretary-treasurer and Amelia Earhart Stuart—or her father. Now how did you exploit a thing like this? Raid Friml's Y.M.C.A. room looking for the Papers? Tell that fathead Anheier about it and have him laugh in your face? Confront Wilson Stuart with it and have him conk out with a heart attack—or throw you in jail for trespassing? Try to bluff the facts out of Amy?

Friml has even visited the Clifton bungalow—*feller who broke the big mirror and my Swedish glass pitcher and your cat'ode-ray tube. That was Friml, Mike. He gets pretty bad.* It had been a gag—maybe. Nothing strange about a Friml swilling his liquor like a pig and breaking things now and then. And talking ...

He raised his arm for a passing taxi.

"Downtown Y.M.C.A.," he told the driver.

XII.

He called up from the lobby. "Friml? Novak again. I'm downstairs. I'm at a loose end and I wonder whether you'd care to join me for a drink or two some place. Maybe we can have a general bull session about the Society. I've been working like a dog and I need some unstringing."

The voice said grudgingly: "Well ... come on up, Dr. Novak. I had some work for this evening, but ..."

Friml had a two-room suite, medium-sized and antiseptically clean. He seemed proud of his place. He showed Novak his desk: "Some people tell you it's a sign of inefficiency to take your work home with you. I don't believe that for a minute. You, for instance—I can tell that you don't leave your job behind when you leave the field."

"I don't think any really conscientious person would," Novak agreed with gravity, and Friml glowed dimly at the implied compliment.

"You're right about—unstringing," said the secretary-treasurer. "I'm not a *drinker*, of course. I'll be with you in a minute." He went into the bathroom and Novak heard the lock turn.

He stood undecided over the desk and then, feeling that it was a childish thing to do, tried its drawers. They opened. In the shallow centre drawer where pencils, rulers, paper clips, and blotters are kept, Friml kept pencils, rulers, paper clips, and blotters. In the top left drawer were letterheads, carbon paper, second sheets, and onionskin in a rack. In the second left-hand drawer were card-file boxes and a corduroy-bound ledger with red leather corners and spine. In the bottom drawer were books with brown wrapping-paper covers on them, the kind school children use on text books.

Friml appeared, looking almost cheerful. "There's a quiet little place on Figueroa Street," he said. "The pianist does request numbers. He's pretty good."

"Fine," said the engineer, depressed.

The place on Figueroa Street wasn't a fairy joint, as Novak had half expected it would be. They sat at a table and had a couple of drinks apiece while the pianist played blues. Novak knew vaguely that it was a big blues-revival year. The engineer made conversation about his membership report for the next meeting. "I don't know just what the members expect, because Clifton spoke off the cuff and there aren't any transcripts."

Friml said relaxedly: "Just give 'em the high spots. About fifteen minutes. And don't go by what Clifton did. Some times he used to just get up and joke. Other times he used to be 'way over their heads with math and electronics."

"That sounds like him. I was wondering about visual aids. Do you think I ought to have some easel cards made up? I think the whole trouble is, I don't know whether the membership report is just a formality or whether they really pay attention. If it's just a noise I'm supposed to make so everybody will feel he's getting his money's worth from the Ph.D., then I won't bother with the cards. If they really listen and learn, I ought to have them."

"You ought to just suit yourself, Novak," Friml said rather expansively. "They like you and that's the main thing. How'd you like *my* job, with everybody calling you a son of a bitch?" He took a deep swallow from his drink. He was having blended rye and ginger ale, the drink of a man who doesn't like to taste his liquor.

Novak excused himself and went to the phone booth. He called Lilly Clifton.

"Mike?" she asked. "Ain't you gonna come 'round tonight like you said?"

"Later, I think," he told her. "Listen, Lilly. I think I've found out something about the death of—of your husband." It was an awkward thing to say.

"So? Tell me." Her voice was unexpectedly grim.

It didn't sound like much in the telling, but she was impressed.

"You got somet'ing," she said. "See if you can bring him around here later. I t'ink he goes for me."

He told her about Friml's memory. She said dryly: "I see. I guess maybe he was a liddle bit queer for Cliff. It drived him nuts the time he was out here, the way Cliff played around vit' me affectionate. Every time Cliff gimme a kiss or somet'ing, Friml took a bigger drink. I guess I was flatt'ring myself. You bring him anyway if you can."

He said he'd try, and went back to the table. Friml was a drink ahead of him by then, and said: "No more for me, Mike," when Novak tried to order. He sounded as though he could be talked into it. The pianist, a little black man at a little black piano on a platform behind the bar, was playing a slow, rippling vamp between numbers. "Coffee Blues!" Friml yelled unexpectedly at him, and Novak started.

The vamp rippled into a dragging blues, and Friml listened bleakly with his chin propped in his hand. He signaled their waiter after a few bars and drank his shot of blended rye without mixing or chasing it. "Great number," he said. "*I like my coffee—sweet, black, and hot ... I like my coffee—sweet, black and hot ... won't let no body fool ... with my coffee pot ...* I always liked that number, Mike. You like it?"

"Sure. Great number."

Friml beamed. "*Some folks like—their coffee tan and strong ...* You ever know any coloured girls, Mike?"

"There were a few from Chicago in my classes at Urbana."

"Good-looking?" Friml wouldn't meet his eye; he was turning over in his hands the pack of matches from the table ash tray.

"Some of them yes, some of them no."

Friml gulped his drink. "Could I borrow a cigarette?" he asked. Novak tapped one out of his pack and held the match for the accountant. Friml got his cigarette wet, but didn't cough. From behind a cloud of smoke he asked: "Did any of the white fellows at the university go around with the coloured girls?"

"Maybe some in Liberal Arts College. None that I remember in Engineering."

"I bet," Friml said broodingly, "I bet a fellow could really let himself go with a colored girl. But if a fellow's trying to build up a good solid record and get some place it wouldn't look good if it got out, would it?"

Novak let him have it. "It wouldn't make much difference if a fellow was just fooling away his time on one bush-league job after another."

Friml quivered and stubbed out his cigarette, bursting the paper. "I really ought to be getting out of here," he said. "One more and then let's beat it, okay?"

"Okay." He signaled and told the waiter: "Double shots." And inquiringly to Friml: "All right, isn't it?"

The secretary-treasurer nodded glumly. "Guess so, 'scuse me." He got to his feet and headed for the men's room. He was weaving. Novak thoughtfully poured his own double shot into Friml's ginger ale.

A sad little man, he thought, who didn't have any fun. Maybe a sad little man who had slunk out of the auditorium of Slovak Sokol Hall during the movie and put a bullet through Clifton's head for an obscure reason that had to do with the Stuarts.

Friml came drifting back across the floor and plopped into his chair. "Don't do this often," he said clearly and gulped his double shot, chasing it with the ginger ale. He put a half dollar on the table with a click and said: "Let's go. Been a very pleasant evening. I like that piano man."

The cool night air did it. He sagged foolishly against Novak and a cruising taxi instantly drew up. The engineer loaded him into it. "You can't go to the Y in this shape," he said. "How about some coffee some place? I have an invitation to Mrs. Clifton's. You can get some coffee there and take a nap."

Friml nodded vaguely and then his head slumped on his chest. Novak gave the cabby the Clifton address and rolled down the windows to let a breeze through.

Friml muttered during the ride, but nothing intelligible.

Novak and the cabby got Friml to the small front porch of the Clifton bungalow, and Novak and Lilly got him inside and onto a couch. The engineer noticed uncomfortably that she was wearing the strapless, almost topless, black dinner dress she'd had on the night Cliff died. He wondered, with a faint and surprising touch of anger, if she thought it would excite him because of that. The bungalow inside had been cleared of its crazy welter of junk, and proved to be ordinary without it. One lingering touch: on spread newspapers stood a sketch box and an easel with a half-finished oil portrait of Lilly, full face and somber with green.

She caught his glance. "I make that. Someth'ing to do." She looked down at Friml and asked cheerfully: "How you feeling, boy? You want a drink?"

Incredibly, he sat up and blinked. "Yeah," he said. "Hell with the job."

"The job will keep," she said, and poured him two fingers from a tall bottle of cognac that stood on a coffee table. He tossed it down in one gulp.

"Don't do this often," he said sardonically. "Not good for the c'reer. The ol' man wouldn't like it."

Wilson Stuart. It had to be. Fighting a tremor in his voice, Novak said: "It's a shame to see a trained man like you tied up with a crackpot outfit like the Society."

"That so?" asked Friml belligerently, "'m doing a better job than anybody thinks. And they all call me a son of a bitch for it. So do you. But *I'm* the guy that sees he gets dollar for dollar. I mean dollar's value for a dollar spent." Friml looked cunning. "I got a c'reer, all right. You may not think so, but I'm gonna be com'troller of a certain big aircraft company one of these days. Not at liberty to tell you which. How's *that* for a c'reer? I'm only twenny-six, but I'm *steady*, 'at's what counts." He fell back on the couch, his eyes still open and glassy, with a little smile on his lips. "Where's 'at drink?" he muttered.

Lilly poured another and put it by his hand. "Here y'are, feller," she said. He didn't move or change expression. She jerked her head at Novak and he followed her to the bedroom.

"What you t'ink?" she asked in a whisper.

"Wilson Stuart and Western Air," he said flatly. "They are the famous 'industrial backers.' Friml is Stuart's man in the A.S.F.S.F. to watch Stuart's money. Stuart gives orders to MacIlheny and Friml's right there to see that they get carried out."

She raised her eyebrows. "Old Stuart don't hire such punks, Mike. Cliff told me."

"He seems to have been hired right out of his graduating class for the sake of secrecy," Novak said. "And he must look like a fireball on paper. Straight A's, no doubt. He's a screwed-up kid, but the pressure has to be right before you realize it." He told her about "Coffee Blues." "Maybe he should be factored by a biomat'ematicist," he said, straight-faced.

She flicked him on the jaw with her fingertips. "Don' tease me," she said crossly. "I'm t'rough vit' them. All they want is you' money. You so smart, tell me what old Stuart wants vit' a moon ship and where he got atomic fuel for it."

"There's no answer," he said. "It's got to be a government working through him. What countries does he sell big orders to? What small countries with atomic energy programmes and dense populations? I guess that narrows the field down a

little. And it makes the thing harder than ever to swallow. Wilson Stuart of Western Air a foreign agent." He thought of what Anheier would say to that, and almost laughed. The thing was now completely beyond the realm of credibility. And it was in their laps.

They went silently back into the living room. The brandy glass was empty again and Friml's eyes were closed at last. He was completely out.

"Mike," she said, "I guess you better leave him here."

"But what about——"

"You a sveet boy, but some other time. This yerk depresses me."

She gave him a cool good-night kiss, and he hiked down the road to a shopping street and taxi stand.

Novak saw, with a pang, that Lilly was not on the field. He asked casually around whether she had phoned or left word with anybody. She hadn't. After last night's fiasco with the drunken secretary-treasurer, he supposed, she felt shy ...

Amy Stuart was there, reporting for assignment, and he savored the mild irony of the situation. Her father, board chairman of Western Air, was funneling money into the A.S.F.S.F. and dictating its policies. And his daughter was reporting for assignment to a hired hand of the Stuart funds. He toyed for a moment with the notion of assigning her to make the lunch sandwiches and dismissed it as silly. She had training and keen intelligence that he needed for *Proto*, whatever *Proto's* destiny was to be.

"Help me in the refractories lab?" he asked.

She said a little woodenly: "I thought that was Lilly's job."

"She didn't show up today. You're not afraid of hot stuff, are you?"

"Hot-radioactive or hot-centigrade?"

He laughed with an effort. She was very boldly playing dumb. "Hot-centigrade. Two thousand degrees of it and up. Tongs, gauntlets, masks, and aprons are furnished. But some people get trembly anyway and drop things."

"I won't," she said. "Not if Lilly didn't."

He taught her routine for an hour and then set her to compounding six more boron carbides by rote. "Call me if there's any doubt at all about a procedure," he said. "And I hope you have a conscience. If you make a mistake, start all over again. A cover-up of a mistake at this stage would introduce a hidden variable in my paper work and wreck everything I'm doing from now on."

"You don't have to impress me with a wild exaggeration like that, Mike. I know my way around a chemistry lab."

The arrogance of the amateur was suddenly too much for him. "*Get out*," he said. "Right now. I'll get by somehow without you."

She stared at him, open-mouthed, and her face became very red. And she left without a word.

Novak strode to the compounding area. His hands deftly did their work with the great precision balance while his mind raged at her insolent assurance. He was letting the beam of the balance down onto the agate knife-edge fulcrum for the sixteenth time when she spoke behind him: "Mike."

His hand, slowly turning a knurled bronze knob, did not twitch. "Minute," he growled, and continued to turn the knob until he felt the contact and the long pointer began to oscillate on the scale. He turned and asked her: "What is it?"

"What the devil do you think it is?" she flared. "I'm sorry I got you sore and in the future I'll keep my mouth shut. Is that satisfactory?"

He studied her indignant face. "Do you still think I was trying to impress you with a wild exaggeration?"

She set her mouth grimly and was silent for a long moment. Then she stubbornly said: "Yes."

Novak sighed. "Come with me," he said, and took her into the small private office. He pulled out yesterday's work sheets and asked: "Know any maths?"

"Up to differential calculus," she said cautiously.

That was a little better than he expected. If she could follow him all the way it would be better for her work—far better than her taking him on faith.

In a concentrated one-hour session he told her about the method of least squares and how it would predictably cut his research time in half, about matrix equations and how they would pin down the properties of the boron carbides, about n-dimensional geometry and how it would help him build a theory of boron carbides, about the virtues of convergent series and the vices of divergent series, and about the way sloppy work at this stage would riddle the theory end of it with divergent series.

"Also," he concluded, "you made me mad as hell."

Laughter broke suddenly through her solemn absorption. "I'm convinced," she said. "Will you trust me to carry on?"

"With all my heart," he grinned. "Call me when the batches are ready for solution."

Cheerfully he tackled yesterday's data and speedily set up the equations that had defied him yesterday.

Amy Stuart called him and he guided her through the rest of the programme on the six new carbides. She was a neat, fast worker who inked her notes in engineer's lettering. She wasn't jittery about handling "hot-centigrade" material. A spy? A handy one to have around. Lilly didn't have her cool sureness of touch.

They worked through the morning, finishing the batch, had sandwiches, and ran another batch in the afternoon. She left at five with the machine-shop gang and Novak put a third batch through himself. He wrote his weekly cumulative report during the four hours it sat aging. The report included a request for Friml to reserve sufficient time with I.B.M.'s EBIC in New York to integrate 132 partial differential equations, sample enclosed, and to post bond on their estimate at \$100 per hour, the commercial rate. With this out of the way he ran tests on the third batch and phoned Barstow for a cab. The gate guard's farewell was awed. Night hitches were unusual.

Novak had dinner in the desert town while waiting for the Los Angeles bus. He asked at his hotel's desk whether there had been any calls. There had been no calls. Phone her? No, by God! He wanted to be alone tonight and think through his math.

In ten days of dawn-to-dusk labour, he had his 132 partial differential equations. The acceleration couches got finished and installed. He ordered the enigmatic "fuel tanks" and left the fabrication to the vendor, a big Buena Vista machine shop. He was no aero-engineer; all he felt competent to do was give them the drawings and specify that the tanks must arrive sufficiently disassembled to pass through *Proto's* open end for final assembly in place.

Amy Stuart continued to be his right bower; Lilly did not reappear at the field. She phoned him once and he phoned her. Astonishingly, they were on a we-must-get-together-some-time-basis. He asked about Friml and Lilly said vaguely: "He's not such a bad kid, Mike. I t'ink you don't do him justice." Novak wondered fleetingly whether Friml was wearing a belt or suspenders these days, and realized that he didn't care a great deal. Amy Stuart asked after Lilly regularly, and he never had anything to tell her.

On a Friday afternoon he zipped a leather brief case around twenty-two ledger sheets on which were lettered in Amy's best engineer style the 132 equations that EBIC would chew into.

"Drive me to town?" he said to her. "I'd like to get to the office before they close up."

"With—the Papers," she said melodramatically, and they laughed. It came to him with a faint shock that it should be no laughing matter, but for the moment he couldn't persuade himself that there was anything sinister about this pretty girl with the sure, cool hands. The shared research, a common drain on them in progress and a mutual triumph at its end, was

too big a thing to be spoiled by suspicion—for the moment. But depression stole over him on the desert road to Los Angeles, as he rode by Amy's side in the little English sportster.

She dropped him in front of the run-down building at 4.30.

He hadn't seen Friml since the secretary-treasurer's brannigan had broken up his plans for an evening. Without a blush, Friml laced into him. He seemed to be trying out a new manner for size: bullying instead of nagging; Friml the Perfect Master instead of Friml the Perfect Servant. "I'm *very* glad to see you again, Dr. Novak. I've tried several times to advise you that you should report regularly, at least once a week, in person, or by telephone if unavoidable."

Nuts. Let him have his fun. "Been pretty busy." He tossed the brief case on Friml's desk. "This is the stuff to send I.B.M. When's our reservation?"

"That's just what I wanted to see you about. Your request—it was fantastic. Who—*who*—is this Mr. Ebic whom you wish to call in as a consultant at *one hundred dollars an hour*?" His voice was a sort of low, horrified shriek.

Novak stared at him in amazement. "Didn't you check to see what it was if you had doubts?"

"Certainly not. It's insane on the face of it. Just what do you think you're up to?"

Conclusion

FOREWORD

Michael Novak, ceramic engineer, working in the Nuclear Energy for the Propulsion of Aircraft (NEPA), Division of the U.S. Atomic Energy Commission, is inexplicably transferred to the Argonne National Laboratory in Chicago where his particular talents are entirely wasted in the field of pure nuclear theory. Attempting in vain to get a suitable transfer he forcibly resigns and attempts to get a job elsewhere. The fact that he had struck the Research Director when handing in his resignation goes against him wherever he applies, and he is getting more than despondent when he receives a curious letter from a Los Angeles office offering him full-time work in refractories research and development with high-altitude jet aircraft.

With Prototype completed the American Society for Space Flight only requires the fuel to make the ship ready for takeoff. But time has just about run out for Novak and his assistants as power politics and pressure groups close in for the kill.

Intrigued by the apparent mystery he travels to Los Angeles and is appalled to find that the office belongs to an obscure amateur organisation known as the American Society for Space Flight. He meets Mr. Friml, the Secretary, and Mr. MacIlheny the President, who assure him that the Society has a progressive programme of development, plus laboratories and a proving ground and unlimited capital, but refuse to disclose where their funds are obtained. Sceptical but still intrigued, Novak goes with Friml to the Society's launching ground and is amazed to find a full scale steel mock-up of a space ship standing on the field.

He is introduced to Clifton the engineer in charge of construction and Friml explains that the one thing lacking is a suitable fuel. He has already been to see Daniel Holland, chief of the U.S. Atomic Energy Commission, in Washington, but the Government were not interested in producing a fuel for the Society. Their plan, states Friml, is to complete the ship and then the Government would be forced to do something about the propulsion unit before any other World power became too interested in the project.

Novak accepts the position, is assigned a workshop and laboratory, and commences work on the firing chambers and throat linings for the Prototype, as the rocket had been named. He soon finds out that most of the 'technicians' working on the project are part-time enthusiasts, and meets Amelia Stuart, daughter of the chief of Western Aircraft, who, apart from being attractive, also holds numerous scientific degrees.

Studying the plans for the fuel chambers, Novak gets the idea that the Society is being financed by foreign backers and tells his suspicions to Clifton. The two of them make a report to Anheier of the A.E.C. Security Office in the local Federal Building, who seems to know more about everyone concerned in the space project than could be expected. He infers that they mind their own business.

Later that same day Clifton is murdered while attending a meeting of the Rocket Society, his assailant escaping during the showing of a science fiction film. Overcome by the shock of his death his wife Lilly is taken to the Beverly Hills home of Amelia Stuart where Novak visits them and informs the two girls that he has accepted the position left vacant by Clifton's death. While there he meets Wilson Stuart, Amelia's father, and sharp words are passed between them—Stuart apparently thinking that Novak's project was typical of cranks.

Meanwhile, in Washington, Daniel Holland of AEC is apparently being singled out by political opponents for public attack—treason is hinted at.

Proto nears completion, both Amy and Lilly assisting Novak in his final work. One afternoon, following a series of unsuccessful tests, Novak goes into Town for relaxation and calls up Friml. The two have a few drinks and Novak becomes suspicious of the little Secretary. He feels sure that he knows something about Clifton's death. He arranges with Lilly to use her feminine wiles upon Friml and leaves him at her home and returns to the field.

Soon after this, work is completed on Proto and Novak leaves for Los Angeles with the final equations for computing. He is confronted by a changed Friml—pugnacious and bullying.

XIII.

"Somebody's been feeding you raw meat, Friml. And I think I know who." Friml looked smug for a moment. "EBIC is I.B.M.'s Electronic—Binary—Integrating—Calculator. Get it? It's the only major electronic calculator available to the private citizen or firm, thanks to I.B.M.'s generosity and sense of public relations."

The secretary-treasurer said petulantly: "You might have made your request clear, Novak."

"Doctor Novak to you," said the engineer, suddenly very sick of the new Friml. It was such a stinking, messy thing to run into after such a beautiful spell of research work. "Now just get me lined up for a crack at EBIC. It's I.B.M., New York. One hundred and thirty-two partial differential equations. Just get it done and stay out of my hair until then."

He walked out of the office, boiling, and picked up a pint of bourbon at a drugstore before he went to his hotel. Swear to God, he thought, this deal's as lousy as A.E.C. and you don't get a pension either.

There were several slips in his pigeonhole at the hotel mail desk. They all said to call Miss Wynekoop at such and such a number as soon as he could, please. He had never heard of Miss Wynekoop, and the phone number didn't ring any bells. He took off his shoes when he got to his room, had a drink of the bourbon, and called the number.

A woman's brightly noncommittal voice said: "Hello?"

"This is Michael Novak, Miss Wynekoop?"

"Oh, Dr. Novak. I wonder if I might see you this evening about employment?"

"I'm not hiring."

She laughed. "I meant employment for you. I represent a firm which is adding to its technical and executive staff."

"I have a job. And a one-year contract with options."

"The contract would be our legal department's worry," she said cheerfully. "And if you meet our firm's standards, I think you'd hesitate to turn down our offer. The pay is very, very good." Then she was crisp and businesslike. "Are you free this evening? I can be at your hotel in fifteen minutes."

"All right," he said. "Why not? I suppose from the way you're putting all this that you're not going to tell me the name of your firm?"

"Well, we do prefer to keep such things quiet," she apologized. "There's speculation and wasted time and broken hearts for the people who think they're going to get it and don't. I'm sure you understand. I'll see you very soon, Dr. Novak." She hung up and he stood for a moment at the phone, undecided. More funny business? Wait and see.

He put his shoes on again, grunting, and chain-smoked until Miss Wynekoop knocked on his door. She was tall, thirty-ish and engaging in a lantern-jawed way. "Dr. Novak. I could tell you were a scientist. They have a look——It was very good of you to let me see you on a moment's notice like this. But I hesitated to contact you through the A.S.F.S.F. In a way I suppose we're trying to steal you from them. Of course our legal people would buy out your contract with them so they'd suffer no financial loss in retraining a man to take your place."

"Sit down, please," he said. "What are these standards your firm wants me to meet?"

She settled herself comfortably. "Personality, for one thing. Our technical people have looked over your record and decided that you're the man for the job if you're available—and if you'll fit in. Our department head—you'd recognize the name, but of course I can't tell you yet—our department head would like me to check on some phases of your career. We're interested, for example, in the events that led up to your separation from A.E.C."

"Oh, are you?" he asked grimly. "As far as anybody is concerned, I resigned without notice after a short, hot discussion with Dr. Hurlbut, the director of the Argonne National Lab."

She giggled. "I'll say. You socked him."

"Well, what about it? If you people thought that means I'm incurably bad-tempered you wouldn't be here interviewing me now. You'd be trying the next guy on the list."

Miss Wynekoop became serious again. "You're right. Naturally we don't want a man who's going to flying off the handle over a trivial difference of opinion. But we certainly wouldn't hold it against you if you had actually been pushed to the breaking point by intolerable conditions. It could happen to anybody. If you will, I'd like you to tell me what brought the disagreement about."

The thing was sounding more legitimate by the minute—and is there anybody who doesn't like to tell his grievance? "Fair question, Miss Wynekoop," he said. "What brought it about was several months of being assigned to a hopelessly wrong job and being stymied every time I tried to get back to my proper work. That's not just my subjective opinion; it's not a gripe but a fact. I'm a ceramics engineer. But they put me into nuclear physics theory and wouldn't let me out. Hurlbut apparently didn't bother to acquaint himself with the facts. He insulted me viciously in public. He accused me of logrolling and incompetence. So I let him have it."

She nodded. "What are the details?"

"Details. What details?"

"Things like, when were you transferred and by whose authority. Your relationship with your superiors generally."

"Well, last August, about mid-month, my transfer order came through without warning or explanation. It was signed by the director of the Office of Organization and Personnel—one of the Washington big shots. And don't ask me about my relationship with him; I didn't have any. He was too high up. My orders before that had always been cut by my working directors."

She looked understanding. "I see. And the working directors: did they ride you? Keep you short of supplies? Stick you on the night-side? That kind of thing?"

Night-side. He had known reporters, and that was newspaper talk. They said without thinking: day-side, night-side, city-side, sport-side. "*Smear us, Novak,*" Anheier had grimly said, "*and we'll smear you back.*" He tried not to panic. "No," he said evenly. "There never was anything like that."

"What was your relationship with, say, Daniel Holland?"

Novak didn't have to fake a bewildered look. "Why, I had nothing at all to do with anybody on his level," he said slowly. "Maybe there's been a mistake. Do you have it clear that I was just a Grade 18? I wasn't in the chain of command. I was just hired help; why should I have anything to do with the general manager?"

She pressed: "But we understand that your transfer order was put through by the director of the Office of Organization and Personnel on the direct suggestion of Mr. Holland."

He shook his head. "Couldn't be. You've been misinformed. Holland wouldn't have known me from Adam's off ox."

Miss Wynekoop smiled briefly and said: "We were pretty sure of our facts. There's another matter. Your AEC Personnel Form Medical 11305 was altered by some means or other last September. Were you retested by the psychologists before that happened?"

"What the deuce is my Personnel Form Medical whatever-it-was?"

"'Personality card' is what they call it unofficially."

Oh. Personality cards he knew about; they were an A.E.C. joke. You took a battery of tests during employment processing and a psychologist evaluated the results and filled out the card with attention to such things as "attitudes," "anxieties," "responses," and other items supposed to give your working director an idea of how to handle you. Your personality card went everywhere with you and it was never, never altered. It was a very peculiar question and it was becoming a very peculiar interview. "Yes," Novak lied. "They ran me through the works again at N.E.P.A. It was some psychologist's brilliant idea of a controlled experiment."

That rocked Miss Wynekoop back on her heels. She smiled with an effort and said, rising: "Thanks very much for your co-operation, Dr. Novak. I'll call you early next week. Thanks *very* much."

When he saw the elevator door at the end of the corridor close on her, Novak called Information. He asked: "Do you have Directory Service in this city? What I mean is, I have a phone number and I want the name and address of the subscriber."

"Yes, sir," said Information. "Just dial the exchange of the number and then dial 4882." Same routine as Chicago.

Directory Service said Miss Wynekoop's phone was an unlisted number and that was that. He called Miss Wynekoop's number again and a man with a pleasant voice answered, saying: "Howard here."

"Let me talk to the editor, Howard," Novak said.

There was a long pause and then: "Who is this, please?"

Novak hung up. "Editor" had meant something to Howard—or maybe Howard just wasn't a quick thinker.

Novak had last seen Anheier, agent in charge for the Los Angeles Regional A.E.C. Security and Intelligence Office, at the inquest on Clifton. Novak had woodenly stood and recited his facts while Anheier's calm eyes were on him, with their threat of instant and total ruin if he voiced his suspicion that Clifton had been murdered in some shadowy atomic intrigue. The verdict had been suicide ...

The engineer hesitated a long minute and called the Security Office in the Federal Building. "Mr. Anheier, please," he said. "This is Dr. Michael Novak."

A man said: "Mr. Anheier's gone home, sir. I'll give you his home phone if it's important, or take a message."

Novak said: "It's important," and got Anheier's home phone number.

The agent in charge was as placid as ever. "Good to hear from you, Dr. Novak. What can I——"

Novak cut him off. "Shut up. I just want to tell you something. You were afraid of my ideas getting into the papers. You said you'd smear me if I did anything to publicize them. I want you to know that the newspapers are coming to me." He proceeded to tell Anheier what had been said, as close to verbatim as he could. At the end of the recital he said: "Any questions?"

"Can you describe this woman?"

He did.

Anheier said: "It sounds like somebody who hit town today. I'm going into the Federal Building office now. Will you come down and look at some pictures? Maybe we can identify this Wynekoop."

"Why should I?"

Anheier said grimly: "I want your co-operation, Dr. Novak. I want to be sure you aren't leaking your story to the papers and trying to avoid retaliation in kind. The more co-operation we get out of you, the less likely that theory will seem. I'll be waiting for you."

Novak hung up the phone and swore. He drank again from the bottle of bourbon and took a taxi to the Federal Building.

There was a long wait in the dimmed hall for the single after-hours elevator. When its door rolled open on the eighth floor, Novak saw that the Security office glass door was the only one on the floor still lit from inside. Twenty-four hours a day, he had heard, with the teletype net always up.

He gave his name to the lone teletype operator doubling at night as receptionist.

"Mr. Anheier's in his office," said the operator. "You see it there?"

Novak went in. The tall, calm man greeted him and handed him a single eight-by-ten glossy print.

"That's her," he said without hesitation. "A reporter?"

Anheier was rocking gently in his swivel chair. "An ex-reporter," he said. "She's Mary Tyrrel. Senator Bob Hoyt's secretary."

Novak blinked uncomprehendingly. "I don't see what I can do about it," he said, shrugging, and turned to leave.

"Novak," Anheier said. "I can't let you out of here."

There was a gun in his hand, pointed at the engineer.

"Don't you know who killed Clifton?" Anheier asked. "I killed Clifton."

XIV.

Night of a bureaucrat.

The bachelor apartment of Daniel Holland was four rooms in an oldish Washington apartment house. After six years in residence, Holland barely knew his way around it. The place had been restrainedly decorated in Swedish modern by the wife of a friend in the days when he'd had time for friends. There had been no changes in it since. His nightly track led from the front door to the desk, and after some hours from the desk to the dressing closet and then the bed. His track in the morning was from the bed to the bathroom to the dressing closet to the front door.

Holland was there in his second hour of paper work at the desk when his telephone rang. It meant a wrong number or—trouble. His eyes slid to the packed travelling bag he always kept beside the door; he picked up the phone and gave its number in a monotone.

"This is Anheier in L.A., chief. Let's scramble."

Holland pushed the scrambler button on the phone's base and asked: "Do you hear me all right?"

"I hear you, chief. Are you ready for bad news?"

The general manager felt a curious relief at the words; the moment had arrived and would soon be past. No more night sweats "Let me have it."

"Hoyt's got the personnel angle. Tyrrel's been grilling Novak. The questions showed that she had just about all of it on ice."

"What does Novak know?"

"Too much. I have him here." The Security man's voice became embarrassed. "I have a gun on him, chief. I've told him I shot Clifton to let him know I mean business. And we can't leave him wandering around. Hoyt would latch on to him, give him a sugar-tit, listen to all he knows and then—we're done."

"I don't doubt your judgment, Anheier," Holland said heavily. "Put him in storage somewhere. I'll fly out to the coast. I've got to talk to him myself."

"You can't fly, chief. It'd be noticed."

"Too much has been noticed. It's a question of time now. Now we must ram it through and hope we're not too late. Good-bye." He hung up before Anheier could protest, and went to get his hat and coat.

Novak listened to the Los Angeles end of the conversation, watching the gun in Anheier's big, steady hand. It never wavered.

The Security man put his odd-looking telephone back into his desk drawer. "Get up," he said. "You won't be killed if you don't make any foolish moves." He draped a light raincoat over the gun hand. If you looked only casually it would strike you as nothing more than a somewhat odd way to carry a raincoat.

"Walk," Anheier told him.

In a fog, Novak walked. It couldn't be happening, and it was. Anheier guided him through the office. "Back late tomorrow, Charles." Yell for help? Break and run? Charles was an unknown, but the big black gun under the coat was a known quantity. Before the thing could be evaluated they were in the corridor. Anheier walked him down the lonesome stairs of the office building, sadly lit by night bulbs, one to a landing. Swell place for a murder. So was the parking lot back of the building.

"I know you drive," Anheier said. "Here." He handed him car keys. "That one."

Use your head, Novak told himself. He'll make you drive to a canyon and then you'll get it without a chance in the world of witnesses. Yell here, and at least somebody will know——

But the big gun robbed him of his reason. He got in and started the car. Anheier was beside him and the gun's muzzle was in his ribs, not painfully.

The Security man gave him laconic traffic directions. "Left. Left again. Right. Straight ahead." Aside from that, he would not talk.

After an hour the city had been left behind and they were among rolling, wooded hills. With dreamlike recognition he stopped on order at the police sentry box that guarded the wealthy from intrusion by kidnapers, peddlers, and thieves. The gun drilled into his ribs as he stopped the car, painfully now. Anheier rolled down his window and passed a card to the cop in the handsomely tailored uniform.

Respectfully: "Thank you, Mr. Anheier. Whom are you calling on?" The best was none too good for the rich. They even had cops who said "whom."

"Mr. Stuart's residence. They'll know my name." Of course. The gun drilled in.

"Yes, sir," said the flunky-cop. "If you'll wait just a moment, sir." The other man in the booth murmured respectfully into his wall phone; he had his hand casually on an elegant repeating shotgun as he listened. He threw them a nod and smile.

"Let's go, Novak," Anheier said.

The gun relaxed a little when the booth was behind them. "You're all in it," Novak said at last, bitterly.

Anheier didn't answer. When they reached the Stuart place he guided Novak up the driveway and into the car port. Lights in the rangy house glowed, and somebody strode out to meet them. Grady, the Stuart chauffeur. "Get out, Novak." For the

first time, the gun was down.

"Grady," Anheier said, "keep an eye on Dr. Novak here. We don't want him to leave the grounds or use the phone or anything like that." He stowed the gun in a shoulder holster. "Well, let's get into the house, shall we?"

The old man was waiting for them in his wheel chair. "What the hell's going on, Anheier? You can't turn this place into an office."

"Sorry," said the Security man briefly. "It can't be helped. The chief's coming out to see Novak. He's found out too much. We can't leave him wandering around."

Wilson Stuart glared at Novak. "My daughter thinks you're intelligent," he said. "I told her she was crazy. Anheier, when's all this going to happen?"

"I don't know. Overnight. He said he'd fly. I tried to talk him out of it."

"Grady," the old man said, "put him in a bedroom and lock the door. I'll have Dr. Morris mix something to give him a good night's sleep."

Incongruously the chauffeur said: "This way, sir."

The bedroom was the same one Lilly had been put up in. Its solid door closed like the door of a tomb. Novak dashed to the long, low window and found it thoroughly sealed to the wall. The place was air-conditioned. Of course he could smash it with a table lamp and jump. And be brought down by a flying tackle or a bullet.

Grady was back in five minutes with a yellow capsule in a pillbox. "Dr. Morris sent this for you, Dr. Novak," he said. "Dr. Morris said it would help you rest." Grady stood by expectantly as Novak studied the capsule. After a moment he said pointedly: "There's water and a glass in the bathroom, sir."

Put on a scene? Refuse to take their nassy ole medicine? He cringed at what would certainly happen. These terrifying competent people would stick him with a hypodermic or—worse—have their muscle man hold him while the capsule was put in his mouth and washed down. He went silently to the bathroom and Grady watched him swallow.

"Good night, Dr. Novak," the chauffeur said, closing the door solidly and softly.

The stuff worked fast. In five minutes Novak was sprawled in the bed. He had meant to lie down for a minute or two, but drifted off. His sleep was dreamless, except that once he fancied somebody had told him softly that she was sorry, and touched his lips.

A man was standing beside the bed when he awoke. The man, middle-aged and a little fleshy, was neither tall nor short. His face was a strange one, a palimpsest. A scholar, Novak fuzzily thought—definitely a pure-research man. And then over it, like a film, slipped a look so different that the first judgment became inexplicable. He was a boss-man—top boss-man.

"I'm Daniel Holland," he said to Novak. "I've brought you some coffee. They told me you shouldn't be hungry after the sleeping capsule. You aren't, are you?"

"No, I'm not. Daniel Holland. A.E.C.? You're——"

The top-boss face grinned a hard grin. "I'm in this too, Novak."

What was there to do? Novak took the coffee cup from the bedside table and sipped mechanically. "Are you people going to kill me?" he asked. The coffee was helping to pull him together.

"No," said Holland. He pulled up a chair and sat. "We're going to work you pretty hard, though."

Novak laughed contemptuously. "You will not," he said. "You can make me or anybody do a lot of things, but not that. I guess just a few clouts in the jaw would make me say anything you wanted me to. Those Russian confessions. The American police third degree. If you started to really hurt me I suppose I'd implicate anybody you wanted. Friends, good friends, anybody. You can do a lot of things to a man, but you can't make him do sustained brainwork if he doesn't want to. And I don't want to. Not for Pakistan, Argentina, the Chinese, or whoever you represent."

"The United States of America?" asked Holland.

"You must think I'm a fool," Novak told him.

"I'm working for the United States," said Holland. "God help me, but it's the only way left. I was hemmed in with this and that——" There was an appeal in his voice. He was a man asking for absolution.

"I'll tell it from the beginning, Novak," he said, under control again.

"In 1951 a study was made by A.E.C. of fission products from the Hanford plutonium-producing reactors. Properties of one particular isotope were found to be remarkable. This isotope, dissolved in water and subjected to neutron flux of a certain intensity, decomposes with great release of energy. It is stable except under the proper degree of neutron bombardment. Its level of radioactivity is low. Its half-life is measured in scores of years. It is easy to isolate and is reasonably abundant. Since it is a by-product, its cost is exactly nothing."

"How much energy?" asked Novak, guardedly.

"Enough to flash the solvent water into hydrogen and oxygen by thermolysis," Holland said. "You've seen the drawings for *Prototype's* fuel tanks, as we called them ..."

Anheier came into the room and Novak barely noticed him. His engineer's mind could see the blue print unrolled before him again. The upper tank containing the isotope-water solution ... the lower tank containing a small heavy-water "fish-bowl" reactor for the neutron source ... the dead-end control systems completed, installed, one metering the fuel solution past the neutron spray of the reactor, the other controlling flux level by damper rods run in and out on servomechanisms ... the fuel solution droplets flashing into hell's own flame and roaring from the throat with exhaust velocity unobtainable by merely chemical reaction ...

Holland was talking again, slowly. "It was just numbers on paper, among thousands of other numbers on paper. It lay for years in the files until one of the high-ranking A.E.C. technical people stumbled on it, understood its implications and came to me. His exact words were: 'Holland, this is space-flight.'"

"It is," Novak breathed. His voice became hoarse. "And you sold it ..."

"*I saved it.* I saved it from the red-tape empire builders, the obscurantists, the mystagogues, the spies. If I had set it up as an A.E.C. project, the following things would have happened. First, we would have lost security. Every nation in the world would shortly have known the space-flight problem had an answer, and then what the answer was. Second, we would have been beaten to the Moon by another nation. This is because our personnel policy forbids us to hire the best men we can find merely because they're the best. Ability ranks very low in the category of criteria by which we judge A.E.C. personnel. They must be conservative. They must be politically apathetic. They must have no living close-relatives abroad. And so on. As bad as the personnel situation, interacting with and reinforcing it, is the fact of A.E.C.'s bigness and the fact of its public ownership. They mean accounting, chains of command, personnel-flow charts—the jungle in which third-raters flourish. Get in the A.E.C., build yourself a powerful clique and don't worry about the work; you don't really have to do any."

The words were fierce; his tone was dispassionate. Throughout his denunciation he wore the pure-research man's face, lecturing coolly on phenomena which he had studied, isolated, linked, analyzed endlessly. If any emotion was betrayed it was, incongruously, the residual affection of a pure-research man for his subject. When the pathologist calls it a beautiful carcinoma he is being neither ironical nor callous.

"As you know," Holland lectured quietly, "the nation that gets to the Moon first has the Moon. The lawyers will be arguing about it for the next century, but the nation that plants the first moon base need not pay any attention to their arguments. I wanted that nation to be the United States, which I've served to the best of my ability for most of my life.

"I became a conspirator.

"I determined to have a moon ship built under non-Government auspices and, quite frankly, to rob the Government to pay for it. I have a long reputation as a dollar-honest, good-government man, which I counted on to help me get away with quite outrageous plundering of the Treasury.

"A study convinced me that complete assembly of a moon ship by a large, responsible corporation could not be kept secret. I found the idea of isolated parts manufactured by small, scattered outfits and then a rush assembly was impractical. A moon ship is a precision instrument of huge size. One subassembly under par would wreck the project. I admit I was toying with the idea of setting up a movie company and building the moon ship as, ostensibly, a set for a science-fiction film, when the A.S.F.S.F. came to my attention.

"Psychologically it seems to have been perfect. You deserve great credit, Dr. Novak, for stubbornly sticking to the evidence and logic that told you *Prototype* is a moon ship and not a dummy. You are the only one who has. Many people have seen the same things you did and refused to believe it because of the sheer implausibility of the situation.

"Hoping that this would be the case, I contacted my old friend Wilson Stuart. He and his company have been the pipeline for millions of Government dollars poured into the A.S.F.S.F. I've callously diverted thousands of A.E.C. man-hours into solving A.S.F.S.F. problems. I had you transferred within the A.E.C. and had your personality card altered so that Hurlbut would goad you into resigning—since the moon ship needed a full-time man with your skills."

"You dared——" choked Novak, stung with rage.

"I dared," Holland said matter-of-factly. "This country has its faults, but of all the nations in the world I judge it as least disqualified to operate a moon base. It's the power of life and death over every nation on the face of the earth, and some one nation has got to accept that power."

Suddenly his voice blazed with passion and the words came like a torrent. "What was I to do? Go ahead and do it the wrong way? Go to the commissioners, who'd go to the congressmen, who'd go to their good friends on the newspapers? Our secrecy would have been wiped out in twelve hours! Set up a Government project staffed with simon-pure but third-rate scientists? Watch the thing grow and grow until there were twenty desk men for every man who got his hands dirty on the real work—and all the desk men fighting like wild beasts for the glory of signing memos? Was I to spare your career and let those A-bomb racks on the Moon go by default to the Argentines or Chinese? Man, what do you think I am?"

"A killer," Novak said dully. "Your man Anheier murdered my friend Clifton."

Anheier's voice was cold. "Executed," he said. "You were there when I warned him, Novak. The penalty for espionage is death. I told him so and he smiled at me to tell me that I wouldn't dare. I told him: 'The penalty is death.' And he went to his home and telephoned his contact, Mr. Boris Chodorov of Amtorg, that he'd have something for him in a day or two. God almighty, Novak be reasonable. Should I have written Clifton a letter? I told him: 'Import-export used to be a favourite, but it was too obvious.' So he smiled at me and went home to call his contact. He had something juicy, something out of the general run-of-the-mill industrial-preparedness information he collected for the Soviets.

"*He* may have thought he was just augmenting his income, that it wasn't *really* espionage, that the United States hasn't got the guts to hit back anyway——" His voice trailed off. "I killed him," he said.

"Clifton a spy," Novak said stupidly. He began to laugh. "And Lilly?"

"Just a stupid woman," Anheier said. "We monitored the Cliftons for a long time, and nothing ever emanated from her."

Novak couldn't stop laughing. "You're quite wrong," he said. A hundred little things slipped suddenly into place. "There is no doubt in my mind that Lilly was the brains of the outfit. I can see now that Lilly was leading me by the nose for weeks, getting every scrap of information I possessed. And when she got just one chance she landed Friml and is now milking him."

Anheier had gone white. "How much does Friml know?" asked Holland.

The Security man said: "Friml knows he's employed by Wilson Stuart. And he can guess at a lot of the rest. The way there's always enough material on hand when we order it from a jobber—even grey-market stuff like copper and steel. Our work. And he knows there are calls to and from Washington that have a connection. Between his brains and Mrs. Clifton's, I think we'd better assume that secrecy is gone." He looked and sounded sick.

"Novak," the general manager asked softly, "are you in this too?"

Novak knew what he meant. "Yes," he said. "It looks like the right side of the fence to me."

Holland said: "I'm glad ... how close to finished is the moon ship?" He was the boss-man again.

"Is the fuel solution ready and waiting?"

"It is. Waiting for word from me. I've also oiled the ways for the diversion of a fish-bowl reactor for your neutron source. It's going to go astray on its way to Cal Tech from Los Alamos."

"EBIC's got to work out my math and I've got to fabricate the liner and vane. At the same time, the ship could be stocked with water, food, and the pressure dome. At the same time the dead-end circuits can be completed. Do you have the food and water and airtanks and lockers?"

"Yes. Give me a figure!" Holland snapped.

Novak choked on it, terrifyingly aware that no man ever before had borne such tidings as he spoke in the bedroom of a rich man's house in Beverly Hills. "It could take off in two weeks," he said. Here we are at last, Novak thought. Time to close the old ledger on man. Add it up, credit and debit, and carry your balance forward to the first page of the next ledger ...

"And now," said Holland grimly, "we ought to go and see some people. They'd both be at her house?"

Novak knew what he meant, and nodded. "I suppose so. It's Saturday."

He led the way to the garage. Amy Stuart's little sports car was at home.

"Mr. Holland," Novak said, "there's going to be a hell of a smash when this comes out, isn't there?"

"We hope not," the general manager said shortly. "We have some plans of our own if they try to jail me for fraud and Anheier for murder and the rest of the crew for whatever they can think of."

"Why should Amy be mixed up in this?"

"We need her," Holland snapped. His manner ruled out further questions. They got into Anheier's car and the Security man drove them to the house in Cahuenga Canyon.

XV.

Lilly met them at the door in a housecoat. "Hallo, Mike," she said. "Who're these people? Oh, you' Anheier, ain't you?"

"My name is Daniel Holland, Mrs. Clifton," the general manager said. She didn't move a muscle. "Do you mind if I come in?"

"I t'ink I do," she said slowly. "Mike, what is all this?"

Novak looked at Holland, who nodded. "Espionage," he said.

She laughed tremulously and told him: "You cra-a-azy!"

"Lilly, you once asked me to find out who killed Cliff. I found out. It was Anheier. Cliff was a spy."

Her expression didn't change as she said: "Cliff was a damned bad spy. Come on in. I got somet'ing to tell you too."

They filed into the living room. "Where's Friml?" Novak asked. She jerked her thumb carelessly toward the bedroom door.

"He's a lot smarter than any of you t'ought," she said, making a business out of lighting a cigarette. "He telled me what he saw and figgered out, and I did some figgering too. You' a very smart man, Mr. Holland. But what I got to tell you is I got this stuff to a friend of mine already. If he don't hear from me by a certain time, he sends it on to the newspapers. How you like that, killer?" She blew a plume of smoke at Anheier.

The large, calm man said: "That means you've got it to your employers by now."

"Does it?" she asked, grinning. "It doesn't matter. All I got to do is sic the papers on you, and you' democra-a-atic country does the rest for us like always. I don't know you' rocket fuel yet. Prob'ly wouldn't know what to do vit' it if Friml brought me a bottleful; I don't know science. But it don't matter; I don't worry. The papers and the Congress raise hell vit' you and lead us right to the rocket fuel so our people that do know science can move in and figger it out."

Stirred by a sudden, inappropriate curiosity, Novak couldn't help asking: "Are you a Communist? Your husband reported to an Amtorg man."

She was disgusted. "Communist, hell! I'm a European."

"I don't see what that——"

"Listen, Mike," she said flatly. "Before you' friends kill me or t'row me in jail or whatever they gonna do. You fat-belly people over here don' begin to know how we t'ink you all a bunch of monkeys vit' the atom bombs and movies and at'letes and radio comics and two-ton Sunday newspapers and fake schools where the kids don' work. Well, what you guys going to do vit' me? Shoot me? Prison? Drop an atom bomb? Solve everyt'ing? Go ahead. I been raped by Yerman soldiers and sedooed vit' Hershey bars by American soldiers. I had the typhus and lost my hair. I walked seventy-five kilometers on a loaf of sawdust bread for a job that wasn't there after all. I speak t'ree languages and understand t'ree more a liddle and you people call me dumb because I got an accent. You people that don' even know how to stand quiet in line for a bus or kinema and t'ink you can run the world. I been lied at and promised to by the stupid Americans. Vote for me and end you' troubles. I been lied at and promised to by the crazy Russians. Nah, vote for me and end you' troubles."

"*Sheissdrek*. So I voted for me-myself and now go ahead and drop you' damned atom bomb on the dumb squarehead. Solve everyt'ing, hey boys? *Sheissdrek*."

She sprawled in the chair, a tight grin on her face, and deliberately hoisted the skirt of her housecoat to her thighs. "Any of you guys got a Hershey bar?" she demanded sardonically, and batted her eyes at them. "The condemned European's la-a-ast request is for a Hershey bar so she can die happy."

Friml was standing there with his thinnish hair tousled, glasses a little crooked on his face, wrapped in a maroon bathrobe. His skinny, hairy legs shook with a fine tremor.

"Hallo, sugar," she said to him with poisonous sweetness. "These yentleman and I was discussing life." She turned to them and lectured elaborately: "You know what happen in Europe when out came you' Kinsey report? This will kill you. All the dumb squareheads and the dumb dagoes and the dumb frogs and krauts said we knew it all the time. American men are half pa-a-ansy and the rest they learn out of a marriage book." She looked at Friml and laughed.

"P-p-pull your skirt down, Lilly," Friml said in a weak, hoarse voice.

"Go find you'self a *nice* girl, sugar," she said carelessly. "May be you make her happy, because you sure as hell don'——" Friml's head bobbed as though he'd been slapped. Moving like an old man, not looking at anything, he went to the bathroom and then to the bedroom and closed the door.

"Like the yoke!" giggled Lilly half-hysterically. "He'll do it too; he's a manly liddle feller!"

"I think——" said Novak starting to his feet. He went to the bedroom door with hurried strides and knocked. "Friml! I want to—to talk to you for a minute!"

The answer was a horrible, low, roaring noise.

The door was locked; Novak lunged against it with his shoulder repeatedly, not feeling the pain and not loosening the door. Anheier pulled him back and yelled at him: "Cut that out! I'll get the window from outside." He rushed from the house, scooping up a light, toy-like poker from the brass stand beside the fireplace.

Holland said at his side: "Steady. We'll be able to help him in a minute." They heard smashing glass and Novak wanted to run out and look through the window. "Steady," Holland said.

Anheier opened the door. "Get milk from the kitchen," he snapped at Novak. The engineer got a brief glimpse of dark red blood. He ran for the kitchen and brought a carton of milk.

While Holland phoned for a doctor, Novak and Anheier tried to pour the milk into Friml. It wouldn't go down. The thrashing thing on the floor, its bony frame and pallid skin pitifully exposed by the flapping, coarse robe, wasn't vomiting. They would get a mouthful of milk into it, and then the milk would dribble out again as it choked and roared. Friml had drunk almost two ounces of tincture of iodine. The sickening, roaring noises had a certain regularity. Novak thought he was trying to say he hadn't known it would hurt so much.

By the time the doctor arrived, they realised that Lilly was gone.

"God, Anheier," Novak said white-faced. "She planned it. A diversion while she made her getaway. She pushed the buttons on him and—is it possible?"

"Yes," the Security man said without emotion. "I fell down badly all around on that one."

"Damn it, be human!" Novak yelled at him.

"He's human," Holland said. "I've known him longer than you have, and I assure you he's human. Don't pester him; he feels very badly."

Novak subsided.

An ambulance with police pulled up to the house as the doctor was pumping morphine into Friml's arm. The frightful noises ebbed, and when Novak could look again Friml was spread laxly on the floor.

"I don't suppose——" Novak said, and trailed off.

"Relation?" the doctor asked. He shook his head. "He'll linger a few hours and then die. I can see you did everything you could, but there was nothing to be done. He seared his glottis almost shut."

"Joel Friml," Novak told the sergeant, and spelled it. It was good to be doing something—anything. "He lives at the Y in downtown L.A. This place is the home of Mrs. August Clifton—widow. He was spending the night here. My friends and I came to visit. Mrs. Clifton seems to have run out in a fit of nerves." He gave his name, and slowly recognition dawned on the sergeant's face.

"This is, uh, kind of funny," the cop told him. "My brother-in-law's in that rocket club so I happen to remember—it was her husband, wasn't it? And wasn't there an Anslinger——"

"Anheier," said the Security man. "I'm Anheier."

"Funnier and funnier," said the sergeant. "Doc, could I see you for a——"

The doctor had been listening, and cut him off. "Not necessary," he said. "This is suicide. The man drank it like a shot of whisky—threw it right straight down. (Was he a drinker, by the way?" "Yes." "Thought so.) There aren't any smears on the lips or face and only a slight burning in the mouth, which means he didn't try to retain it. He drank it himself, in a synchronized toss and gulp."

The sergeant looked disappointed, but brightened up to ask: "And who's this gentleman?"

Holland took out a green card from his wallet and showed it to the sergeant. Novak craned a little and saw that it was a sealed, low-number White House pass. "Uh," said the sergeant, coming to something like attention, "I can't see your name, sir. Your finger——"

"My finger stays where it is, sergeant," said Holland. "Unless, of course, you *insist*——?" He was all boss.

"No, no, no, not at all, sir. That's quite all right. Thank you." The sergeant almost backed away as from royalty and began to snarl at his detail of two patrolmen for not having the meat loaded yet.

They rushed into action and the sergeant said to nobody in particular and very casually: "Think I'd better phone this in to headquarters." Novak wasn't surprised when he heard the sergeant say into the phone, louder than he had intended: "Gimme the city desk, please." Novak moved away. The thing had to come out sooner or later, and the tipster-cop was earning a little side money honestly.

After completing his call, the sergeant came up beaming. "That wraps it up except for Mrs. Clifton," he said. "She took her car? What kind?"

"Big maroon Rolls Royce," Novak said. "I'm not sure of the year—maybe early thirties."

"Well, that don't matter. A Rolls is a Rolls; we'll be seeing her very soon, I think."

Novak didn't say what he thought about that. He didn't think any of them would be seeing Lilly again. He thought she would vanish back into the underworld from which she had appeared as a momentary, frightening reminder that much of the world is not rich, self-satisfied, supremely fortunate America.

In Anheier's car on the road back to the Wilson Stuart place, the Security man asked tentatively: "What do you think, chief?"

"I think she's going to release everything she's got to the newspapers. First, as she said, it means we'll lose secrecy. Second, it would be the most effective form of sabotage she could practice on our efforts. The Bennet papers have been digging into my dirty work of the past year for circulation-building and for Hoyt, whom they hope to put in the presidency. The campaign should open in a couple of days, when they get Lilly's stuff as the final link.

"I've got to get to Washington and contract a diplomatic illness for the first time in my life. Something that'll keep me bedridden but able to run things through my deputy by phone. Something that'll win a little sympathy and make a few people say hold your horses until he's able to answer the charges. I can stall that way for a couple of weeks—no more. Then we've got to present Mr. and Mrs. America with a *fait accompli*. Novak!"

"Yessir!" snapped Novak, surprising himself greatly.

"Set up a *real* guard system at the moon ship. If you need any action out of Mr. MacIlheny, contact Mr. Stuart, who will give him your orders. MacIlheny—up to now—doesn't know anything about the setup beyond Stuart. Your directive is: *build us that moon ship. Fast.*"

"Yes, sir."

"And another thing. You're going to be busy, but I have some chores for you nevertheless. Your haircut is all wrong. Go to a really good barber who does theatrical people. Go to your dentist and have your teeth cleaned. Have yourself a couple of good suits made, and good shoes and good shirts. Put yourself in the hands of a first-rate tailor. It's on the expense account and I'm quite serious about it. I only wish there were time for ..."

"How's that, sir?" Novak couldn't believe he had heard it right.

"Dancing lessons," snapped Holland. "You move across a room with all the grace of a steam thresher moving across a Montana wheatfield. And Novak."

"Yes?" said the engineer stiffly.

"It's going to be rough for a while and they may drag us down yet. Me in jail, you in jail, Anheier in the gas chamber, Stuart fired by his board—if I know the old boy he wouldn't last a month if they took Western away from him. You're going to be working for your own neck—and a lot of other necks. So work like hell. Hoyt and Bennet play for keeps. This is a bus stop? Let Novak out, Anheier. You go on downtown and let's see production."

Novak stood on the corner, lonely, unhappy, and shaken, and waited for his downtown bus.

His appetite, numbed by last night's sedative, came on with a rush during the ride. After getting off, he briskly headed for a business-district cafeteria, and by reflex picked up a newspaper. He didn't go into the cafeteria. He stood in the street, reading.

DEATH STRIKES AT 2nd ROCKET-CLUB CHIEF:

POISONED ON VISIT TO 1st VICTIM'S WIDOW

Post *Special Correspondent*

Violent death struck late today at a leader of the American Society for Space Flight, nationwide rocket club, for the second time in less than a month. The first victim was club engineer August Clifton, who committed suicide by shooting in a room next door to a meeting of the club going full blast. Today club secretary-treasurer Joel Friml, 26, was found writhing in pain on the floor of a Cahuenga Canyon bungalow owned by Clifton's attractive blonde widow Lilly, 35. Both bodies were discovered by club engineer Michael Novak. A further bizarre note lies in the fact that on both occasions A.E.C. Security agent J. W. Anheier was on the scene within seconds of the discovery.

Police Sergeant Herman Alper said Novak and Anheier paid a morning visit to Mrs. Clifton's home and chatted with her and Friml, who had arrived earlier. Friml disappeared into the bedroom, alarming the other guests. They broke into the bedroom by smashing a window and found Friml in convulsions, clutching a two-ounce bottle of a medicine meant for external use. They called a doctor and tried to give milk as an antidote, but according to the physician the victim's throat had been so damaged that it was a hopeless try.

Friml was taken by ambulance under sedation to Our Lady of Sonora hospital, where no hope was given for his recovery. In the confusion Mrs. Clifton fled the house, apparently in a state of shock, and had not returned by the time the ambulance left.

Friends could hazard no guess as to the reason for the tragedy. Friml himself, ironically, had just completed auditing the rocket club's books in a vain search for discrepancies that might have explained the Clifton suicide.

It was bad. Worse was coming.

XVI.

Novak moved out to the field, bag and baggage, that night and worked himself into a pleasant state of exhaustion. He woke on his camp cot at nine to the put-put of an arriving jalopy. It was a kid named Nearing. He made a beeline for Novak, washing up in a lab sink.

"Hi, Dr. Novak." He was uncomfortable.

"Morning. Ready for business?"

"I guess so. There's something I wanted to ask you about. It's a lot of nonsense, of course. My brother's in the C.B.S. newsroom in L.A., and he was kidding me this morning. He just got in from the night shift and he said there was a rumour about *Proto*. It came in on some warm-up chatter on their teletype."

Already? "What did he have to say?"

"Well, the A.S.F.S.F. was—'linked' is the word, I guess—with some big-time Washington scandal that's going to break. Here." He poked a wad of paper at Novak. "I thought he was making it up. He doesn't believe in space flight and he's a real joker, but he showed me this. He tore it off their teletype."

Novak unfolded the wad into a long sheet of cheap paper, torn off at the top and bottom.

BLUE NOSE AND A PURPLE GOATEE.

HA HA THATS A GOOD ONE. U KNOW ABT BISHOP OF BIRMINGHAM???

SURE WHO DONT. OGOE THREE AM AND THREE HOURS TO GO.

LOOK WHOS BITCHING. HERE ITS SIX AM AND SIX HOURS TO GO. WISH ID LEARNED A TRADE OR STAYED IN THE NAVY.

WHAT U DO IN NAVY???

TELETYPE OPR. CANT GET AWAY FROM DAM PTRS SEEMS AS IF.

MIN FONE

WHO WAS IT???

ELEANOR ROOSEVELT ASKING FOR A DATE U NOSY BASTRD

HA HA OGD WOTTA SLO NITE. ANY NUZ UR SIDE???

NOT YET. FIRST CAST HALF HOUR. NUZMAN CAME IN WITH RUMOR ABT SOME UR LOCAL SCREWBALLS TO WIT LOS ANGELES SPACE FLITE CLUB.

HEY HEY. NUZRITER HERE GOT KID BROTHER IN CLUB. WOT HE SAY???

SAID STRICTLY PHONY OUTFIT WITH WA TIEUP TOP ADMININXXX

ADMINISTRATION GOT IT FINALLY FIGURES.

GOVT MONEY GOES TO CLUB AND CLUB KIX BACK TO GOVT OFFICIALS. SWEET RACKET HUH.

MORE???

NO MORE. MIN I ASK. SAYS GOT IT FM BENNET NUZ SVC MAN.

NO MORE.

TNX. COFFE NOW.

WELCM. DONT SPILL IT.

HA HA U R A WIT OR MAYBE I AM ONLY HALF RITE.

Nearing said as Novak looked up from the paper: "Of course Charlie may have punched it out himself on a dead printer just to worry me." He laughed uncomfortably. "Oh, hell. It's just a rumour about a rumour. But I don't like them tossing *Proto's* name around. She's a good girl." His eye sought the moon ship, gleaming in the morning sun.

"Yes," Novak said. "Look, Nearing. I'm tightening up the guard schedule and I'm going to be very busy. I'd like to turn the job of handling the guard detail over to you. I'll put you on salary, say fifty a week, if you'll do it."

"Fifty? Why sure, Dr. Novak. That's about what I'm getting at the shoe store, but the hell with it. When do I start and what do I do?"

"Start now. I want two guards on duty at all times. Not under twenty-one, either. At night I want one guard at the gate and one patrolling the fence. I want strict identification of all strangers at the gate. I want newspapermen kept out. I want you to find out what kind of no-trespassing signs we're legally required to post and how many—and then post twice as many. I want you to get the huskiest youngsters you can for guards and give them night sticks." He hesitated. "And buy us two shotguns and some shells."

The boy looked at Novak and then at the *Prototype* and then at Novak again. "If you think it's necessary," he said quietly. "What kind of shells—bird shot?"

"Buckshot, Nearing. They're after her."

"Buckshot it is, Dr. Novak," the shoe clerk said grimly.

He worked all morning in the machine shop, turning wooden core patterns for the throat liner on the big lathe. Laminated together and rasped smooth, they would be the first step in the actual fabrication of the throat liner. Half a dozen youngsters showed up, and he put them to work routing out the jacket patterns. Some of the engineer-members showed up around noon on their Sunday visits and tried to shop-talk with him. He wouldn't shop-talk.

At three in the afternoon Amy Stuart was saying to him firmly: "Turn that machine off and have something to eat. Nearing told me you didn't even have breakfast. I've got coffee, bologna on white, cheese on rye—"

"Why thanks," he said, surprised. He turned off the power and began to eat at a work-bench.

"Sorry they pulled rough stuff on you," she said.

"Rough?" he snorted. "That wasn't rough. Rough is what's coming up." Between bites of sandwich he told her about the teletype chatter.

"It's starting," she said.



The next day the dam broke.

Reporters were storming the gate by mid-morning. In due course a television relay truck arrived and from outside the fence peered at them with telephoto lenses.

"Find out what it's all about, Nearing," Novak said, looking up from his pattern making.

Nearing came back with a sheaf of papers. "They talked me into saying I'd bring you written questions."

"Throw 'em away. Fill me in in twenty seconds or less so I can get back to work."

"Well, Senator Hoyt's going to make a speech in the Senate today and he's wired advance copies all over hell. And it's been distributed by the news agencies, of course. It's like the rumour. He's going to denounce Daniel Holland, the A.E.C. general manager. He says Holland is robbing the Treasury blind by payments to the A.S.F.S.F. and Western Air, and getting kickbacks. He says Holland's incompetence has left the U.S. in the rear of the atomic weapons parade. Is my time up?"

"Yes. Thanks. Try to get rid of them. If you can't, just make sure none of them get in here."



There were days when he had to go into town. Sometimes people pointed him out. Sometimes people jostled him and he gave them a weary stare and they either laughed nervously or scowled at him, enemy of his country that he was. He was too tired to care deeply. He was working simultaneously on the math, the controls, installation of the tanks, and the setup for forming the liner and vane.

One day he fainted while walking from the machine shop to the refractories lab. He came to in his cot and found Amy Stuart and her father's Dr. Morris in attendance.

"Where did you come from?" he asked dimly.

Dr. Morris growled: "Never mind where I came from. You ought to be ashamed of yourself, Novak. Playing the fool at your age! I'm telling you here and now that you are going to stay in bed for forty-eight hours and you are not going to use the time to catch up on your paper work either. You are going to sleep, eat, read magazines—not including the *Journal of Metallurgical Chemistry* and things on that order—and nothing else."

"Make it twenty-four hours, will you?" said Novak.

"All right," Dr. Morris agreed promptly and Novak saw Amy Stuart grin.

Novak went to sleep for twelve hours. He woke up at eleven p.m., and Amy Stuart brought him some soup.

"Thanks," he said. "I was thinking—would you get me just the top sheet from my desk? It won't be *work*. Just a little calculation on heat of forming. Really, I'd find it relaxing."

"No," she said.

"All right," he said testily. "Did the doctor say you had to keep a twenty-four hour guard on me?"

"He did not," she told him, offended. "Please excuse me. There are some magazines and newspapers on the table." She swept out and he wanted to call after her, but ...

He got out of the cot and prowled nervously around the room. One of the papers on the table was the Los Angeles paper of the Bennet chain.

HOYT DARES "ILL" HOLLAND TO SHOW M.D. PROOF!

shrieked its banner headline. Novak swore a little and climbed back into the cot to read the paper.

The front-page first-column story was all about Hoyt daring "ill" Holland to show M.D. proof. Phrases like "since Teapot Dome" and "under fire" were liberally used. Also on the front page a prominent officer of a veterans' organisation was quoted as daring "ill" Holland to show M.D. proof. So were a strident and aging blonde movie actress, a raven-haired, marble-browed touring revivalist, and a lady Novak had never heard of who was identified as Washington's number-one hostess. The rest of the front page was given over to stories from the wire services about children rescuing animals from peril and animals rescuing children from peril.

Novak swore again, a little more strongly, and leafed through the paper. He encountered several pages of department store ads and finally the editorial page and feature page.

The double-column, heavily-leaded editorial said that no reasonable person could any longer ignore the cold facts of the A.E.C.-Western Air-rocket-crackpot scandal. Beyond any doubt the People's money and the People's fissionable material—irreplaceable fissionable material—was being siphoned into a phony front for the greed of one man.

For Bennet patrons who wanted just the gist of the news, or who didn't read very well, there was the cartoon. It showed a bloated, menacing figure, labelled "Dan Holland," grinning rapturously and ladling coins and bills from a shoe-box Treasury Building into his pockets. There was one ladle in each hand, one tagged "Western Aircraft" and the other "Rocket Crackpots." A tiny, rancid, wormy, wrinkled old man was scooting in a wheel chair in circles about the fat boy's ankles, picking up coins Holland carelessly let dribble from the overflowing ladles. That was Wilson Stuart, former test pilot, breaker of speed and altitude records, industrialist whose aircraft plants covered a major sector of America's industrial defence line. Other little figures were whizzing in circles astride July-fourth rockets. They also were grabbing coins. Wild-eyed and shaggy under mortar-board hats, they were the rocket crackpots.

On the opposite page there was something for everybody.

For the women there was a column that wept hot tears because all America's sons, without exception, were doomed to perish miserably on scorching desert sands, in the frozen hell of the Arctic, and in the steamy jungles of the Pacific, all because of Daniel Holland. "How long, O Lord, how long?" asked the lady who wrote the column.

For the economist there was a trenchant column headed: "This Is Not Capitalism." The business writer who conducted the column said it wasn't capitalism for Western Air's board of directors to shilly-shally and ask Wilson Stuart exactly where he stood vis-a-vis Daniel Holland and what had happened to certain million-dollar appropriations rammed through under the vague heading of "research." Capitalism, said the business writer, would be for Western Air's board to meet, consider the situation, fire Stuart, and maybe prosecute him. Said the business writer: "The day of the robber barons is past."

For the teen-ager there was a picture of a pretty girl, holding her nose at some wiggly lines emanating from a picture of the Capitol dome. Accompanying text:

"Joy-poppers and main-liners all, really glom onto what Mamaloi's dishing this 24. I don't too often get on the sermon kick because young's fun and you're a long time putrid. But things are happening in the 48 that ain't so great so listen, mate. You wolves know how to handle a geek who glooms a weenie-bake by yacking for a fat-and-40 blues when the devotees know it's tango this year. Light and polite you tell the shite, and if he doesn't dig you, then you settle it the good old American way: five-six of you jump him and send him on his meddy way with loose teeth for a soo-ven-war. That's Democracy. Joy-poppers and main-liners, there are grownups like that. We love and respect Mom and Dad even if they

are fuddy-duddy geeks; they can't help it. But what's the deal and hoddy feel about a grownup like Danny-O Holland? And Wheel-chair Wilson Stuart? And the crackpot cranks with leaky tanks that play with their rockets on dough from your pockets? Are they ripe for a swipe? Yeah-man, Elder. Are their teeth too tight? Ain't that man right! Sound off in that yeah-man corner, brethren and cistern! You ain't cackin', McCracken! So let's give a think to this stink for we, the youths of America today, are the adults of America tomorrow."

For those who vicariously live among the great there was the Washington column. "Local jewellers report a sharp, unseasonal drop in sales. Insiders attribute it to panic among the ranks of Dan (Heads-I-Win-Tails-You-Lose) Holland and his little Dutch Boys over the fearless exposé of his machinations by crusading Senator (Fighting Bob) Hoyt. Similar reports in the trade from the West Coast, where Wilson (Wheel-Chair) Stuart and the oh-so-visionary-but-where's-the-dough pseudo-scientists of the A.S.F.S.F. hang out. Meanwhile Danny Boy remains holed up in his swank ten-room penthouse apartment claiming illness. Building employees say however that not one of his many callers during the past week has carried the little black bag that is the mark of the doctor!... What man-about-Washington has bought an airline ticket and has his passport visaed to Paraguay, a country where officials are notorious for their lack of co-operation in extradition proceedings—if their palms are properly greased?"

For lovers of verse there was a quatrain by one of the country's best-loved kindly humourists. His whimsical lines ran:

*They say Dan Holland will nevermore
Go anywhere near a hardware store.
He'll make a detour by train or boat
Because he knows he should cut his throat.*

Novak smiled sourly at that one, and heard a great tooting of horns. It went on, and on, and on, and on. Incredulously he clocked it for three solid minutes and then couldn't take any more. He pulled on his pants and strode from the prefab into a glare of headlights. There were jalopies, dozens of them, outside the fence, all mooing.

Nearing ran to him. "You ought to be in bed, Dr. Novak!" he shouted. "That doctor told us not to let you——"

"Never mind that! What the hell's going on?" yelled Novak, towing Nearing to the gate. The two guards were there—husky kids, blinking in the headlights. They'd been having trouble filling the guard roster, Novak knew. Members were dropping away faster every day.

"Kids from L.A.!" Nearing shouted in his ear. "Came to razz us!"

A rhythmical chant of "*O-pen up!*" began to be heard from the cars over the horns.

Novak bawled at them: "Beat it or we'll fire on you!" He was sure some of them heard it, because they laughed. One improbably blonde boy in a jalopy took it personally and butted his car into the rocket field's strong and expensive peripheral fence. It held under one car's cautious assault, but began to give when another tanker joined the blonde.

"All right, Eddie!" Novak shouted to the elder of the gate guards. "Take your shotgun and fire over their heads." Eddie nodded dumbly and reached into the sentry box for his gun. He took it out in slow motion and then froze.

Novak could understand, even if he couldn't sympathize. The glaring headlights, the bellowing horns, the methodical butting of the two mastodons, the numbers of them, and their ferocity. "Here," he said, "gimme the goddam thing." He was too sore to be scared; he didn't have time to fool around. The shotgun boomed twice and the youth of America shrieked and wheeled their cars around and fled.

He handed back the shotgun and told Eddie: "Don't be scared, son." He went to the phone in the machine shop and found it was working tonight. People had been cutting the ground line lately.

He got the Stuart home. "Grady? This is Dr. Novak. I want to talk to Mr. Stuart right away and please don't tell me it's late and he's not a well man. I know all that. Do what you can for me, will you?"

"I'll try, Dr. Novak."

It was a long, long wait and then the old man's querulous voice said: "God almighty, Novak. You gone crazy? What do you want at this time of night?"

Novak told him what had happened. "If I'm any judge," he said, "we're going to be knee-deep in process servers, sheriff's deputies, and God-knows-what-else by tomorrow morning because I fired over their heads. I want you to dig me up a real, high-class lawyer *and fly him out here tonight.*"

After a moment the old man said: "You were quite right to call me. I'll bully somebody into it. How're you doing?"

"I can't kick. And thanks." He hung up and stood irresolutely for a moment. The night was shot by now—he'd had a good, long rest anyway——

He headed for the refractories lab and worked on the heat of composition. He cracked it at six a.m. and immediately started to compound the big batch of materials that would fuse into the actual throat-liner parts and steering vane. It was a grateful change of pace after working in grams to get going on big stuff. He had done it by ten-thirty and got some coffee.

The lawyer had arrived: a hard-boiled, lantern-jawed San Francisco Italian named DiPietro. "Don't worry," he grimly told Novak. "If necessary, I'll lure them on to the property and plug 'em with my own gun for trespassing. Leave it in my hands."

Novak did, and put in an eighteen-hour stretch on fabricating pieces of the throat liner. Sometime during the day Amy Stuart brought him some boxes and he mumbled politely and put them somewhere.

With his joints cracking, he shambled across the field, not noticing that his first automatic gesture on stepping out of the shop into the floodlight area was to measure the *Prototype* with his eye in a kind of salute.

"How'd it go?" he asked DiPietro.

"One dozen assorted," said the lawyer. "They didn't know their law and even if they did I could have bluffed them. The prize was a little piece of jail-bait with her daddy and shyster. Your shotgun caused her to miscarry; they were willing to settle out of court for twenty thousand dollars. I told them our bookkeeper will send his bill for five hundred dollars' worth of medical service as soon as he can get around to it."

"More tomorrow?"

"I'll stick around. The word's spread by now, but there may be a couple of die-hards."

Novak said: "Use your judgment. Believe I can do some work on the servos before I hit the sack."

The lawyer looked at him speculatively, but didn't say anything.

XVII.

A morning came that was like all the other mornings except that there was nothing left to do. Novak wandered disconsolately through the field, poking at this detail or that, and Amy came up to him.

"Mike, can I talk to you?"

"Sure," he said, surprised. Was he the kind of guy people asked that kind of question?

"How are the clothes?"

"Clothes?"

"Oh, you didn't even look. Those boxes. I've been shopping for you. I could see you'd never have time for it yourself. You don't mind?"

There it was again. "Look," he said, "have I been snapping people's heads off?"

"Yes," she said in a small voice. "You didn't know that, did you? Do you know you have a week-old beard on you?"

He felt it in wonder.

"I've never seen anything like it," she said. "The things you've accomplished. Maybe nobody ever saw anything like it. It's finished now, isn't it?"

"So it is," he said. "I didn't think—just installing the last liner segment and hooking on the vane. Mechanical oper—"

"*God, we've done it!*" He leaned against one of *Proto's* delta fins, shaking uncontrollably.

"Come on, Mike," she said, taking his arm. She led him to his camp cot and he plunged into sleep.

She was still there when he woke, and brought him coffee and toast. He luxuriated in the little service and then asked abashedly: "Was I pretty bad?"

"You were obsessed. You were a little more than human for ten days."

"Holland!" he said suddenly, sitting full up. "Did anybody—"

"I've notified him. Everything's going according to plan. Except—you won't be on the moon ship."

"What are you talking about, Amy?"

She smiled brightly. "The counter-campaign. The battle for the public being waged by those cynical, manipulating, wonderful old bastards, Holland and my father. Didn't you guess what my part in it was? I'm a pretty girl, Mike, and pretty girls can sell anything in America. I'm going to be the pilot—hah! pilot!—of the first moon ship. So gallant, so noble, and such a good figure. I'm going to smile nicely and male America will decide that as long as it can't go to bed with me, the least it can do is cheer me on to the Moon."

She was crying. "And then I showed I was my father's daughter. The cynical Miss Stuart said we have a fireworks display in the takeoff, we have conflict and heroism, we have glamour, what we need is some nice refined sex. Let's get that dumb engineer Novak to come along. A loving young couple making the first trip to the Moon. Irresistible. Pretty girl, handsome man—you *are* handsome without that beard, Mike." She was crying too hard to go on. He mechanically patted her shoulder.

Her sobs abated. "Go on," he said.

"Nothing to go on about. I told 'em I wouldn't let you go. I love you too much."

His arm tightened around her. "That's all right," he said. "I love you too much to let you go without me."

She turned her tear-stained face to him. "You're not going to get noble with *me*—" she began. And then: "Ouch! Mike, the beard!"

"I'll shave," he said, getting up and striding to the lab sink.

"Don't cut yourself, Mike," she called after him. "But—please hurry!"

There was one crazy, explosive week.

There was something in it for everybody. It was a public relations man's dream of heaven.

Were you a businessman? "By God, you have to give the old boy credit! Slickest thing I ever heard of—right under the damn Reds' noses, stuck right out there in the desert and they didn't realise that a rocket ship was a rocket ship! And there's a lot of sense in what Holland had to say about red tape. Makes you stop and wonder—the armed services fooling around for twenty years and not getting to first base, but here this private club smacks out a four-bagger first time at bat. Illegal? Illegal? Now mister, be sensible. Don't get me wrong; I'm not any admirer of the late F.D.R., but he did get us the atom bomb even if he did practically hand it to the Reds right after. But my point is, F.D.R. didn't go to Congress with a presidential message that we were going to try to make an atomic bomb. He just quietly diverted the money and made one. Some things you have to do by the book; others you just plain can't. For my money, Dan Holland's a *statesman*."

Were you a girl? "Oh, that dreamy man Mike! It just chills me when I think of him flying all the way to the Moon, but it's kind of wonderful, too. Did you ever notice the way he's got kind of a dimple but not quite on the left when he smiles?"

Were you a man? "Amy's got real looks and class. Brains, too, they tell me, and God knows, she's got guts. The kind of girl you'd want to *marry*, if you know what I mean. He's a lucky guy."

Were you old folks? "Such a lovely couple. I don't know why more young people aren't like that nowadays. You can see how much they're in love, the way they look at each other. And the idea of them going to the Moon! I certainly never thought I'd see it in my time, though of course I knew that some day ... Perhaps their rocket ship won't work. No, that's absurd. Of course it'll work. They look so nice when they smile at each other!"

Were you young folks? "I can't get over it. Just a pair of ordinary Americans like you and me, a couple of good-looking kids that don't give a damn and they're going to shoot off to the Moon. I saw them in the parade and they aren't any different from you and me. I can't get over it."

Were you a newspaper publisher? "Baby, this is it! The perfect cure for that tired feeling in the circulation department. I want *Star-Banner-Bugle-and-Times-News* to get Mike-and-Amy conscious and stay that way. Pictures, pictures, pictures. Biographies, interviews with roommates, day-by-day coverage, our best woman for Amy and our best man for Mike. The hell with the cost; the country's on a Mike-and-Amy binge. And why shouldn't it be? A couple of nice young kids and they're going to do the biggest thing since the discovery of fire. A landmark in the history of the human race! And confidentially, this is what a lot of the boys have been waiting for with Bennet. Naturally only a dirty Red rag would attack a fellow-publisher, but I don't see any ethical duty to keep me from sawing off a limb Bennet crawled out on all by himself. He's mouse-trapped. To keep his hard core of moron readership he's got to keep pretending that *Proto's* still a fake and Holland's still a crook and only taper off slowly. I'm almost sorry for the dirty old man, but he made his bed."

Were you a congressman? "Hmmm. Very irregular. In a *strict* sense illegal. Congress holds the purse strings. Damn uppity agencies and commissions. Career men. Mike and Amy. Wonder if I could get photographed with them for my new campaign picture. Hmmm."

On the fourth day of the crazy week they were in Washington, in Holland's office.

"How's it going?" he demanded.

"I don't know how MacArthur stood it at his age," Amy muttered.

There was a new edition to Holland's collection of memorabilia on the wall behind his desk: a matted and framed front page from the New York *Times*.

HOLLAND BREAKS SILENCE, CALLS ASFSF NO FRONT SAYS CLUB HAS MOON
SHIP READY TO MAKE TRIP WILSON STUART DAUGHTER, ENGINEER TO PILOT

The agitation of the *Times* was clearly betrayed in the awkwardly rhyming second line.

"The Air Force gentlemen are here, Mr. Holland," said the desk intercom.

"Send them in, Charlie."

Three standard-brand Air Force colonels, one general and an off-brand captain walked in. The captain looked lost among his senior officers, six-footers all. He was a shrimp.

"Ah, gentlemen. General McGovern, Colonels Ross, Goldthwaite, and Behring. And the man you've been waiting to meet, Captain Dilaccio. Gentlemen, you know Amy and Mike, of course. Please be seated."

They sat, and there was an ugly pause. The general exploded, almost with tears in his voice: "*Mister* Holland, for the last time. I will be perfectly frank with you. This is the damn'dest, most unreasonable thing I ever heard of. We have the

pilots, we have the navigators, we have the experience, and we ought to have the moon ship!"

Holland said gravely: "No, General. There's no piloting involved. The landing operation simply consists of putting the throat-vane servo on automatic control of the plumb bobs and running in the moderator rods when you hit. The navigation is child's play. True, the target is in motion, but it's big and visible. And you have no experience in moon ships."

"*Mister* Holland——" said the general.

Holland interrupted blandly. "And even if there were logic on your side, is the public deeply interested in logic? I think not. But the public is deeply interested in Amy and Mike. Why, if Amy and Mike were to complain that the Air Force had been less than fair with them——"

His tone was bantering, but McGovern broke in, horrified: "No, no, no, no, Mr. Holland! They aren't going to do anything like that, are they? Are you?"

Holland answered for them. "Of course not, General. They have no reason to do anything like that—do they?"

"Of course not," the general said glumly. "Captain Dilaccio, good luck." He and the colonels shook hands with the puny little captain and filed out.

"Welcome to the space hounds," Novak told Dilaccio, trying to be jovial.

The captain said indistinctly: "Pleasure'm sure."

On the flight back to Barstow he didn't say much else. They knew he had been chosen because he was (a) a guided-missile specialist, (b) single and with no close relations, (c) small and endowed with a singularly sluggish metabolism. He was slated for the grinding, heartbreaking, soul-chilling job of surviving in a one-man pressure dome until the next trip brought him company and equipment.

On the seventh day of the crazy week, Daniel Holland heard somebody behind him say irritably: "Illegal? Illegal? No more illegal than Roosevelt taking funds and developing the atomic bomb. Should he have gone to Congress with a presidential message about it? It was the only way to do it, that's all."

Holland smiled faintly. It had gone over. The old clichés in their mouths have been replaced by new clichés. The sun blazed into his eyes from the polished shell of the moon ship, but he didn't turn or squint. He was at least a sub-hero today.

He caught a glimpse of MacIlheny as the band struck up the sedate, eighteenth-century "President's March." MacIlheny was on the platform, as befitted the top man of the A.S.F.S.F., though rather far out on one of the wings. MacIlheny was crying helplessly. He had thought he might be the third man, but he was big-bodied and knew nothing about guided missiles. What good was an insurance man in the Moon?

The President spoke for only five minutes, limiting himself to one humorous literary allusion. ("This purloined letter—stainless steel, thirty-six-feet, plainly visible for sixty miles.") Well, *he* was safely assured of his place in history. No matter what miracles of statesmanship in war or peace he performed, as long as he was remembered he would be remembered as President during the first moon flight. The applause was polite for him, and then slowly swelled. Amy and Mike were walking arm in arm down a hollow column of M.P.s, Marines and A.F.P.s. Captain Dilaccio trailed a little behind them. The hollow column led from the shops to the gantry standing beside *Proto*.

Holland felt his old friend's hand grip his wrist. "Getting soft, Wilson?" he muttered out of the corner of his mouth.

The old man wouldn't be kidded. "I didn't know it would be like this," he said hoarsely. Amy's jacket was a bright red patch as the couple mounted the stand and shook hands with the President. Senile tears were running down Wilson Stuart's face. Great day for weeping, Holland thought sullenly. All I did was hand the U.S. the Moon on a silver platter and everybody's sobbing about it.

The old man choked: "Crazy kid. Daniel, what if she doesn't come back?"

There was nothing to say about that. But——"She's waving at you, Wilson!" Holland said sharply. "Wave back!" The old man's hand fluttered feebly. Holland could see that Amy had already turned to speak to the President. God, he thought. They're *hard*.

"Did she see me, Dan?"

"Yes. She threw you a big grin. She's a wonderful kid, Wilson." Glad I never had any. *And* sorry, too, of course. It isn't that easy, ever, is it? Isn't this show ever going to get on the road?

The M.P.s, Marines, and A.F.P.s reformed their lines and began to press back the crowd. Jeeps roared into life and began to tow the big, wheeled reviewing stand slowly from the moon ship. With heartbreaking beauty of flowing line, Amy swung herself from the platform to the hoist of the gantry crane. Mike stepped lightly across the widening gap and Captain Dilaccio—Good God, had the President even spoken to him?—jumped solidly. Mike waved at the craneman and the hoist rose with its three passengers. It stopped twenty-five feet up, and there was clearly a bit of high-spirited pantomime, Alphonse-and-Gaston stuff, at the manhole. Amy crawled through first and then she was gone. Then Dilaccio and then Novak, and they all were gone. The manhole cover began to close, theatrically slow.

"Why are we here?" Novak wondered dimly as the crescent of aperture became knifelike, razorlike, and then vanished. What road did I travel from Canarsie to here? Aloud he said: "Preflight check; positions, please." He noted that his voice sounded apologetic. They hunkered down under the gothic dome in the sickly light of a six-watt bulb. Like cave people around a magic tree stump they squatted around the king-post top that grew from the metal floor.

"Oxygen-CO₂ cycle," he said.

That was Dilaccio's. He opened the valve and said, "Check."

"Heater." He turned it on himself and muttered, "Check."

Novak took a deep breath. "Well, next comes fuel metering and damper rods—oh, I forgot. Amy, is the vane servo locked vertical?"

"Check," she said.

"Right. Now, the timers are set for thirty seconds, which is ample for us to get to the couches. But I'd feel easier if you two started now so there won't be any possibility of a tangle."

Amy and Dilaccio stood, cramped under the steep-sloping roof. The captain swung into his couch. Amy touched Mike's hand and climbed to hers. There was a flapping noise of web belting.

"Check."

"All secure," said Dilaccio.

"Very good. *One*—and *two*." The clicks and the creak of cordage as he swung into his couch seemed very loud.

Time to think at last. Canarsie, Troy, Corning, Steubenville, Urbana, N.E.P.A., Chicago, Los Angeles, Barstow—and now the Moon. He was here because his parents had died, because he had inherited some skills and acquired others, because of the leggy tough sophomore from Troy Women's Day, because Holland had dared, because he and Amy were in love, because a Hanford fission product had certain properties, because MacIlheny was MacIlheny——

Acceleration struck noiselessly; they left their sound far behind.

After a spell of pain there was a spell of discomfort. Light brighter than the six-watt bulb suddenly flooded the steeple-shaped room. The aerodynamic nose had popped off, unmasking their single port. You still couldn't pick yourself up. It was like one of those drunks when you think you're clearheaded and are surprised to find that you can't move.

She should have spent more time with her father, he thought. Maybe she was afraid it would worry him. Well, he was

back there now with the rest of them. Lilly, paying somehow, somewhere, for what she had done. Holland paying somehow for what he had done. MacIlheny paying. Wilson Stuart paying.

"Mike," said Amy's voice.

"All right, Amy. You?"

"I'm all right."

The captain said: "All right here."

A common shyness seemed to hold them all, as though each was afraid of opening the big new ledger with a false or trivial entry.

THE END

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[The end of *Takeoff* by Cyril M. Kornbluth.]