

On Deception Watch

(A World Federation Novel)

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Preface

This is a work of fiction. The science described here is accurate and either already demonstrated or considered by experts to be plausible. The characters are mostly fictional. However, the character Arthur J. Cranshaw is modeled after the late Keeve M. Siegel, a professor of physics at the University of Michigan in Ann Arbor and successful entrepreneur. He was the founder of KMS Fusion, the first and only private sector company to achieve controlled thermonuclear fusion using laser implosion technology. On May 1, May 3, and again, on May 9, 1974, KMS Fusion achieved—to the embarrassment of federal government laboratories—the world's only successful laser-induced nuclear fusion ignition. The fictitious company, AJC Fusion, is modeled after KMS Fusion.

Professor Siegel died on March 14, 1975, under mysterious circumstances while testifying before the Joint Congressional Committee on Atomic Energy. He was testifying about government obstruction of his company's (successful) research efforts. With his death the property rights of KMS Fusion were essentially looted by the federal government, and its race to achieving controlled nuclear fusion was fatally crippled. No laboratory has yet achieved what KMS Fusion achieved in 1975.

The rest of the story is the plausible prediction of how the World Federation might come to be.

On Deception Watch

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The two boys, one seventeen and the other nineteen, left their car parked on the grass, under a tree off East Absecon Boulevard, and walked with their buckets and rakes to the water's edge. No one would bother their car as this was a well-known clamming area and was a more or less understood sanctuary from crime. The police would leave their car alone as well. Especially on Saturdays. It was an informal neighborhood understanding. The day was starting out warm and sunny, and the boys quickly kicked off their sandals and with their clamming gear waded into the shallow water.

They quickly adjusted to the slight chill of the shallow Absecon Bay water and moved out until they were about waist-deep. They separated, working with about twenty yards between them, moving their feet into the sandy bottom, feeling for clams with their toes that had grown experienced and discriminating. When they felt the hard lump of a quahog shell, they took their rake and scooped it up, the sand and muck falling away between the tines. Cherrystones were what they were getting, the main ingredient in their mother's New England clam chowder.

The older brother filled his bucket first and walked back to the shore to place his haul in the cooler they had left in the car. As he was putting his sandals back on to walk to the car, he noticed something shining in the cordgrass, about ten feet from where he was standing. Looking closer,

he found it was only a pair glasses. Bending down to pick them up, he saw about ten more feet into the cordgrass what looked like a shoe. Walking over to it, he was startled to see that it was a shoe, but connected to a foot and to the rest of the body as well. It was the body of a well-dressed middle-aged man lying face up among the floppy, broad green blades. The young man went to his car to retrieve his cell phone and called 911. He called to his brother to come out of the water. He wanted to show him something, he said. Then they waited for the police.

The newspapers the next day reported that the body of Brian Sorenson, an optical design engineer working for AJC Fusion, a New Jersey-based high-tech company, washed ashore Saturday morning along the edge of Absecon Bay, just north of Atlantic City. The sheriff's spokesperson said the body showed signs of a struggle. There were several broken bones. The police speculated that it was probably a homicide related to sizable winnings by the victim at the Tropicana where he had been playing until the early hours of the morning of the day his body was discovered. No money was found with the body, according to a police spokesperson.

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James Marshall was disappointed as he pulled into the visitors' parking area of AJC Fusion. He had hoped for something more impressive. The office building was located in an undistinguished, backwater New Jersey industrial park. Poorly tended turf surrounded the vinyl-clad building. Brush and weeds spread thickly beyond the tired-looking lawn surrounding the building with its unfulfilled promise. Several dumpsters and a border of tall chain-link fencing clarified any possible misconception of the type of tenant using this building—an unimpressive, industrial operation like scores of others in the park.

A modest false stone facade at the entrance provided an unimaginative decorative touch to the otherwise drab appearance of this surprisingly small one-story AJC Fusion building. Marshall counted only twenty parking spaces in the lot adjacent to the building. He was told that about

eighty employees worked here. He couldn't understand where they all were or where their cars could be. In fact, he couldn't understand why Dick Scully would even want him to interview this man, Cranshaw. Marshall assumed Arthur Cranshaw was no more than the crackpot chairman of a half-baked company with delusions of grandeur, and he said exactly that to his editor. Scully must have been running short of ideas for the Sunday science supplement.

Marshall parked his car, grabbed his briefcase from the backseat, and walked quickly through the brisk New Jersey air to the entrance of the building. An assignment is an assignment, he thought, and you do what you're told. You never know what might become interesting in this business.

A pleasant-enough male receptionist greeted him with a warm and welcoming smile, though Marshall couldn't imagine he had many opportunities to use it.

"Good morning. My name is James Marshall. With the *Washington Courier*?" he said, introducing himself. "I'm here to see Mr. Cranshaw."

"Good morning, sir. May I ask if Dr. Cranshaw is expecting you?" Friendly, but firm, in control, Marshall thought. No emphasis on the "doctor." Just matter of fact.

"Yes, he is."

"Thank you, sir. Would you mind signing in and having a seat for a moment?" After confirming Marshall's visit, the receptionist informed him that an escort would be coming to get him in a few moments.

Marshall studied the reception area. It was perfectly nondescript. Canvas wallpaper, gray carpeting, watercolor still-lifes, coffee table with sporting, business, and news magazines, a couple of potted plants, and the company name on the wall in large brass letters. Nothing that indicated what AJC Fusion actually did for a living.

This was very surprising for a so-called high-tech company. In James Marshall's experience small companies like to tout their successes with photos, plaques, magazine articles, even their pipe dreams framed on the walls. But nothing showed here.

Meanwhile the receptionist had busied himself preparing an identifying security label for Marshall. As he was handing it to him, the door to the interior of the building opened, and a trim, attractive black woman entered the reception area.

Smiling, she offered her hand to Marshall as she introduced herself. "How good that you were able to come on such short notice, Mr. Marshall. My name is Sylvia Carlyle, Dr. Cranshaw's executive administrator. Dr. Cranshaw is delighted to be able to meet you. He's read many of your articles. I know he has an interesting interview planned for you."

Her handshake was firm and businesslike. She was about twenty-five years old and dressed in black slacks and white blouse with a tight, high collar that emphasized her long and slender neck. Her hair was pulled lightly back, with the few errant strands adding a touch of abandon, complementing her smooth face and broad, sensual mouth. She wore no jewelry except for a cameo pin on her blouse.

She had a way of looking directly at his eyes that made Marshall wonder what she was really thinking while her face was smiling.

Turning to the receptionist she asked, "Are we all set?" Receiving a nod of confirmation, she turned again to Marshall, helping him attach his security badge. "Shall we go? I hope your trip from Washington was uneventful."

Passing through the door, they entered a long carpeted hallway that seemed to go the length of the building. The hallway was lit with muted, low-intensity lighting.

Once they were well into the hallway, Marshall stopped for a moment. "Ms Carlyle—it is Ms, isn't it?—I'd like to ask you something before we see your boss."

"Yes, it's 'Ms' and fire away."

"A moment ago you said you were glad I could come on such short notice. Who is interviewing whom here? Did we call you or did you call us?" Marshall asked, trying to read her face.

"An interesting question. I would like to suggest that you save it until you've met Dr.

Cranshaw. I'm not trying to be evasive, Mr. Marshall, but it really would be best."

They continued down the hall. "If you say so. Let me try again from another direction. My reputation as a reporter is at stake now, you know. I'm supposed to get answers to questions," Marshall said, smiling. "How about you? How did you come to work for AJC Fusion?"

"Oh, that was very simple. I was a graduate student at Columbia University. Dr. Cranshaw was one of my professors. You know black women doing graduate work in physics are not so common, so I stood out from the crowd, I guess you'd say. Dr. Cranshaw offered me a part-time position with AJC Fusion, and it blossomed, happily. That was three years ago."

"You said that your boss has read my articles. Like what, for instance, or was that just polite talk?"

She smiled at Marshall. "Like your master's thesis, your three technical publications in the *Physics Review Letters*, your two publications in the *Physical Review*, authored jointly with your advisor, Professor Tilden, and all your feature articles with the *Courier* for the last nine months. He even read your book on physics games for children. You have quite a wide readership, Mr. Marshall."

Marshall was stunned. He couldn't think of another question to ask for the moment. He couldn't decide if he was more impressed by her for knowing all this or Cranshaw for allegedly reading it all. But why would she say he read it if he didn't? Just be professional, he told himself. Stop prejudging. These people are serious.

They walked on silently. Arriving at Cranshaw's office, Sylvia Carlyle knocked on the door, awaited the response to enter, and ushered Marshall in. She quickly made the introductions and left the office.

It was an elegant office, richly paneled in dark mahogany. The carpet was deep and thick. The desk was massive, but uncluttered. Ceiling-to-floor bookshelves lined one wall. The visitor furniture was ornate and overstuffed. The wing chair Marshall was ushered to by Sylvia Carlyle when he had entered was accompanied by an ebony end table.

The office did not give the appearance of a working office. It had more of the feel of a retreat. There was no phone, no computer terminal, and no file cabinet. These deficiencies were luxuries only a chairman could allow himself—or be allowed.

Yet nothing in the room or in his preliminary conversation with Ms. Carlyle had prepared him for the physical reality of Arthur Cranshaw. He was the closest thing Marshall had ever seen to a human sphere. Cranshaw sat at his desk, leaning back in his chair, hands folded together and resting on his belly or rather just above the equator of his girth. He was dressed in a perfectly cut, dark blue, pinstripe suit, white shirt, and tie. French cuffs with Chinese gold panda-coin cufflinks showed from the jacket sleeves. His hands were small and bloated. His fingers also were corpulent but pink and immaculately manicured. He had no neck. His face was round and smooth and surprisingly youngish-looking and seemed to be attached directly to the trunk of his body.

Cranshaw presented a strange combination of personal excess and fastidious attention to superficial appearances. Marshall was not happy with his own initial revulsion at Cranshaw's appearance. After a few moments of pleasantries, he wished to get the interview over with, and so bantering became more focused.

"So, Dr. Cranshaw, then it was you who called Dick Scully. You must have told him something very interesting for him to pay to send me here. This is a little far from my usual beat," Marshall said as he opened his briefcase and retrieved his steno pad.

"Oh, Dick knows a good story when he hears it. I think you will too. Shall we begin?" He leaned a notch further back in his chair, looking directly at Marshall.

"Fine. To begin with, what exactly are you making here?"

Cranshaw thought for a moment. "History, Mr. Marshall. History." He closed his eyes, and his head rolled back slightly, giving the impression he was slipping into a meditative state. This was an obsessed man, Marshall thought. Obsessed people made Marshall nervous. He waited.

Cranshaw continued slowly, "Mr. Marshall, do you know what will be the most important quest for mankind in this century? It will not be the search for alien life or the grand unification

theory of quantum mechanics and relativity nor will it be the endless search for the cure for cancer. No, Mr. Marshall, it will be for energy. Such a small word—energy. It is totally inadequate to its importance.

“Without dependable energy civilization as we know it would cease. As with our own deaths, Mr. Marshall, we cannot fully contemplate the consequences of a worldwide energy deficit. Yet that is what we are rapidly approaching. We consume energy in huge amounts in our modern world. And each emerging nation adds significantly to the energy drain.

“It cannot go on indefinitely, Mr. Marshall, since fossil fuels are our primary source of energy and they are rapidly being depleted. Nuclear fission reactors provide only partial relief and uranium is a far from unlimited and inexpensive fuel.

“Energy depletion is only a matter of time. And we can calculate that time now and it is nearer than we admit publicly, Mr. Marshall.” He stopped, closed his eyes again, and this time began to speak while apparently in communion with a higher presence than James Marshall.

“It is a problem of historic proportions. And we are making history here. Now.” He leaned forward in his chair, hands now on the desktop, looking at Marshall.

“You asked me what we make here. We make solutions. We have solved the problem of unlimited energy, Mr. Marshall.”

Marshall was not impressed with the histrionic presentation or with the claim.

“Excuse me, Dr. Cranshaw, but this claim has been made before. But perpetual motion machines have gone out of style this century.”

“No, not a perpetual motion machine. That is for the application of energy. I am talking about the creation of unlimited energy, the answer to this century’s dream of power from water, of controlled nuclear fusion. That is what we make here, Mr. Marshall, to answer your question directly. We make fusion happen and we get neutrons and with neutrons we make methane from the air and from the methane we strip off the hydrogen atoms to use as fuel in a fuel cell, and the fuel cell makes electricity, and the electricity is energy.

“Think of it, Mr. Marshall, we use the abundant neutrons produced by the fusion reaction and the carbon dioxide free to us in the air and we make methane. Yes but synthetic methane. We actually will be reducing the amount of carbon dioxide in the air as we make methane. But even synthetic methane is still methane—a kind of ‘nonfossil’ fossil fuel. But only if you burn it. We don’t burn the methane. We use it as a source of hydrogen atoms. We use genetically engineered cyanobacteria and our proprietary cocktail of enzymes to strip the hydrogen, which we collect from the methane, leaving a carbon- and nitrogen-rich slurry that can be used as a fertilizer. A fertilizer. Do you see? Reduced carbon dioxide, low-cost, low-energy hydrogen production, high-efficiency fuel-cell-generated electricity, and a fertilizer by-product, not poisonous chemical waste. Is it not amazing! We don’t contribute to greenhouse gases and we get more energy more safely with an energy economy based on hydrogen. And as you know, the only product from a hydrogen fuel cell is water. We know how to do it and we have done it.”

Marshall remained silent, inhibited by Cranshaw’s vehemence. He was not sure if he was physically safe or whether Cranshaw was mad but harmless.

“You don’t believe me, do you?” Cranshaw said, reading his skepticism on Marshall’s face. Grateful for the opening, Marshall asked, “Well, as a reporter, I’m sure you can appreciate that there is a big difference between claiming and doing. But let me ask you one question before we get too far. Why you? If you don’t mind my saying so, a lot smarter people with a lot of government money have been working on fusion all over the world and haven’t even come close. It’s a little hard to accept what you are claiming.”

“We shall see. I anticipated this question, of course. Do you know why these other researchers have not succeeded while I have? They have the wrong goal. Their goal is to pursue truth to uncover the mysteries of nature. Mine is more mundane. It is to make money. My goal was to find a process that will work. Not the best or most elegant process, but one that will suffice. And if I succeed I do not lose my reason for being, I begin selling my product. It is not the end for me and my life-work, as it would be for the national labs working this same problem.

It is the beginning.

“And you are wrong about a very important point, Mr. Marshall. There are no smarter people working on this project than those working here for me. You find this hard to believe so I will explain. The vast institutional fusion effort supported by major governmental funding—and I mean hundreds of millions of dollars—is directed toward magnetic confinement. We are using laser implosion. Magnetic confinement means nothing to us. We do not compete for these brains. Our problems were optics, laser physics, stable implosion models, nuclear chemistry. Completely different fields, Mr. Marshall, from those of the establishment. We don’t compete for the same people.”

“But both our government and the Russians are funding laser fusion research,” Marshall said.

“Yes, but they are fallback positions not taken seriously, used to fund graduate students or out-of-fashion eccentrics at the Lawrence Livermore Labs, with no serious project planning. Frankly, these projects cannot compete with what I pay for the best talent in the world. Nor are they as well planned. I have three Nobel Prize laureates working here, Mr. Marshall. All on two-year sabbaticals from their universities or laboratories. They could not turn down my offers. The science and the money were too compelling. And of course, their universities granted them their sabbaticals as they would grant them anything they asked. Such is the power of academic stardom.

“Also, as you may know, this is not my only company. AJC Fusion is a wholly owned subsidiary of Nova Industries. I own that company as well. Do you know what Nova Industries specializes in? We make the finest aspherical lenses in the world. These are essential in the laser optical path techniques that we have developed. Let me repeat, since you ask, ‘Why me?’ Because we make the best aspherical lenses in the world. Other laboratories, even with their inferior efforts, struggle with multiple lasers. We break our single laser pulse into carefully controlled multiple segments that meet simultaneously, that recombine all at the same time on the

implosion target. Do you see? We only use one laser. We have no synchronization handicap. We don't have to get multiple lasers to act as one. We use only *one* laser. We can do this and no one else, *no one else can!*"

"Let me get this straight. What exactly do you claim to have done and can you show me anything to verify your claims?" Marshall asked.

"Now you are beginning to see. And ask the right questions. What we have done is achieve ignition of a deuterium-tritium target pellet. Our target team completed development of the pellet seven months ago. Using a high energy laser burst, split by our optical path design, using our lenses to impinge the laser energy on the target capsule equally from all sides, we have succeeded in fusing the target. Nuclear fusion ignition, Mr. Marshall, not in a magnet, but in a little glass bead. We have verified this by examining the neutron radiation emitted from the target. The product of nuclear fusion is telltale neutrons, you see. The neutrons are our proof. This is well-known physics, as I am sure you are aware. And we can achieve this fusion ignition routinely, as it were. Repeatability, Mr. Marshall, is what brings credibility. This alone is an historic achievement. We are now rising up the economic curve, approaching breakeven. You know what I mean by breakeven, of course?"

"When you get as much energy out as you put in?" Marshall ventured.

"Close, but not quite. We are a business and think in business terms. For us, breakeven is when the cost to us of the energy used equals the price we can charge for the energy produced. The greater the compression of our targets, the more neutrons we produce, and the more energy we can make. Simply put, we are looking for the biggest bang for the buck. We are laser-limited at the moment, but that problem is being addressed as we speak."

"You ask what exactly have we done. Mr. Marshall, laser fusion is only one aspect of our revolution. You realize that all large power stations, even nuclear stations, are just glorified water boilers that make steam that drive turbines that drive electric generators. We use nineteenth-century technology to make electricity using steam, Mr. Marshall. Nuclear energy to boil water to

make steam. Steam, Mr. Marshall. It is barbaric!

“The efficiency of conversion of a steam-driven turbine system is anywhere from 5 to 50 percent. Fuel cells operate at virtually 100 percent efficiency because they generate no heat. But fuel cells need a source of cheap fuel. Remember, we are after the biggest bang for the buck, Mr. Marshall. We do not use our neutrons to generate heat to make steam. We use them to alter the nuclear structure of atoms. We do nuclear chemistry with them, Mr. Marshall. We make economical synthetic methane from our neutrons, using hydrogen from water and carbon from air. And from this methane, we get hydrogen with which we make electricity, using fuel cells. Creating methane from neutrons and carbon dioxide, Mr. Marshall. It has never been done before. Never even thought of.

“We are founding not just a company here, Mr. Marshall. We are founding a revolution, a new era. Life will never be the same. Energy, boundless, endless energy. Compared to what we have done, the industrial revolution will look like child’s play. This is the destiny of humanity. Unlimited energy that does not destroy the planet.

“We will stop the wasteful and ignorant burning of fossil chemicals and substitute a new era based on a commercially practical hydrogen economy. That is what we have done, what we have actually done.”

Cranshaw sank back in his chair, slowly folding his hands across his belly, smiling, and watching Marshall struggle to absorb all he had just been told.

Finally, Marshall put down his pad and looked intently at Cranshaw, trying to read behind his intense, round face. “But why have there been no announcements? If what you are saying is true, the whole world would be at your feet.”

“But Mr. Marshall, that is why you are here.”

“I don’t understand. You don’t make an announcement like this through a feature writer for the Sunday edition of the *Washington Courier*, even a good one—a great one—like me. This is front-page New York Times stuff, if it’s true.”

At that moment, there was a knock on the door. Following Cranshaw's "Come in," Sylvia Carlyle entered. Cranshaw's secretary followed just behind her with a tray of coffee, tea, and cups and saucers for three. "Time for a break, gentlemen," she said indicating to the secretary to place the tray on the coffee table by the couch. Cranshaw left his desk and sat on the couch. Marshall turned his chair to face Cranshaw. Sylvia Carlyle sat in a chair near Cranshaw.

Marshall looked quizzically at Cranshaw when he realized that she was not leaving.

"Ms. Carlyle is my executive administrator. As such, she knows everything, Mr. Marshall. Ms. Carlyle is involved with everything of consequence here. You are a matter of consequence for us."

Marshall tipped his head in acknowledgment of Cranshaw's compliment and then turned to Sylvia Carlyle.

"Well, your boss has been telling me quite a story. But I'm still not sure why I'm here. Why me?" he asked, looking at her over his coffee cup.

"That's simple, James. You don't mind if I call you James? Good. Please call me Sylvia. It will be your job to see to it that we aren't murdered. All of us."

Her bland presentation of his assignment, a smile still lingering on her face, raised the hairs on the back of Marshall's neck. He suddenly realized that he wasn't doing an interview. He was being recruited—recruited into something that Dick Scully knew about and approved.

"That's not my line of work, Ms. Carlyle—Sylvia. I'm just a reporter. I don't do security. I'm not beefy enough," he added smiling.

Sylvia Carlyle smiled back and said, "We'll see."

Cranshaw added, "Perhaps you will think we are being melodramatic, Mr. Marshall. I assure you, we are not. But you will judge that for yourself before the day is out."

"Notwithstanding, if you agree, you will be an essential element of our announcements. We have experienced an internal problem that necessitates our 'breaking the story,' as you journalists say, sooner than we planned. We want it presented with credibility. A journalist of your technical

stature will protect us from the strategy of ridicule by those who will certainly become our enemies. Once a subject of ridicule we would easily be destroyed behind the scenes, out of the public view, with no one questioning our disappearance.”

Holding a pastry in midflight to his mouth, Cranshaw continued, “We are being a bit unfair to you, hitting you with everything at once. But you see, time has become of the essence and we must get our act in gear, as it were. Sylvia, perhaps this is a good time to show Mr. Marshall our facilities. He is probably tired of listening to me by now.”

“Certainly, Dr. Cranshaw.” Then turning to Marshall, she said, “Shall we begin now?”

Marshall welcomed the chance to think about what he had been told so far. It just didn’t ring true. Technical achievements like these just didn’t happen in the dark without some word leaking out.

Leaving Cranshaw’s office, Sylvia led Marshall down the hall to the elevator bank. Entering the car, Marshall noted that it indicated two levels, the one they were on and another marked “D.” It still did not compute.

“I’m told there are about eighty people working here, but I don’t see how. They can’t all fit in these two floors,” he said, as the elevator made its slow descent.

“Of course, you are correct. And you’re wrong. There are about seventy-eight people all together working here, but there are not two floors. There are five, including an underground garage. Intentionally this is not easy to determine from the outside. For security reasons, for each floor—except the first, which is the lowest security level, and the last, which is the highest—there are two elevators. Each elevator goes only one floor, either up and down one or down and up one. There is a security check at each level. It is impossible to go directly from the fifth level to the surface level in one elevator. We are, after all, dealing with atomic research for profit. Our own precautions against industrial espionage impose far greater precautions than what the federal government requires for safety purposes.”

As the doors opened, they entered a waiting area with a communications microphone and

speaker connecting to the guard beyond the plate glass window. The window contained a sliding tray similar to those at drive-up bank deposit windows.

As the drawer slid out Sylvia said, "You put your hand on the plate and it does a fingerprint check. I'm sorry, but we take the fingerprints of all visitors, although they don't usually know it. When you signed in, it was taken from the page on the sign-in sheet. Special paper. If you hadn't touched the paper, the guard would have spoken to you."

"Also, there is a complete visual check through the window by the guard. They have a freeze-frame monitor that connects them with the waiting room to detect a potential switch after you leave the reception area."

Carlyle stepped closer to the window. There was a small black pattern, a circle with a cross, like a telescopic sight, etched in the glass. She looked closely at it for several seconds.

"For employees there's also a retinal pattern check for positive identification. You would not be allowed below the ground level without a positively identified employee with the appropriate security clearance."

Their identifications validated and completed, the guard opened the door and they entered another long corridor.

"On this level, we do mathematical modeling studies and telemetry development. On the 'C' level we do fuel cell and target pellet development. On the 'B' level we do nuclear chemistry development. On the bottom or 'A' level we do laser optics development and we have the complete operational system. We'll visit that area last."

"Look, Sylvia, I can understand all the industrial espionage measures, but you were over dramatizing the murder stuff a bit, weren't you?"

"James, you have to think about the vested interests that this work threatens with obsolescence. Do you realize that the big five petroleum companies in the United States have annual sales far larger than the gross national product of most countries in the world? They're not going to be happy with our announcement of a viable laser fusion process supporting a hydrogen-

energy economy. Nor will the thousands of companies supporting the oil companies. The Organization of Petroleum Exporting Companies will not be too happy either. Neither will the coal suppliers, the fission-reactor people, the magnetic-confinement people with by now their hundreds of millions of dollars of wasted effort. We're talking about business interests worth billions—actually, hundreds of billions of dollars. People have been killed for a lot less than that. Our own government will not be too happy either."

Marshall interrupted her. "Why the government? Aren't they trying to find the same answers?"

"Yes, of course. And that's just the point. If a government-sponsored program finds the solution, the solution belongs in the public domain. We're a completely privately funded company. Even the government-mandated security for nuclear experimentation is paid for by us. We have patented everything. Our company intends to profit from everything through license fees. Billions of dollars of tax money have been spent in anticipation of an ultimate public windfall. This won't be the case now. I think the phrase is 'heads will roll.'"

"I see. Still, murder seems a little obvious. No one could believe that they would get away with that sort of thing. Have there been any threats made against any of you?"

"Not exactly. One of our engineers was found dead near Atlantic City recently. A terrible tragedy and possibly a warning of things to come. Also, Our director of operations, Philip Layland, is missing. But actually, we believe he may have gone over to the enemy camp, so to speak. The oil companies. Philip has been a problem for several months now. Assume for the moment that what you have heard about the achievements of AJC Fusion is true. You can imagine the importance of our patents and the potential future value of our company. Well, Philip understood this as much as any person living. He petitioned Dr. Cranshaw quite vigorously for an equity interest in the company. Dr. Cranshaw had to become quite firm with him in denying Philip's ultimatum. There's no other word, I suppose, considering Philip's vehemence over the issue. Threats were made during that conversation. Perhaps he was carried away in the heat of the

discussion. But now he is missing.”

“How critical to the operation is he?” Marshall asked.

“To our operations, quite critical. We are struggling to work around his absence at the moment. In addition, he was instrumental in analyzing our profitability projections, our marketing strategies, and overtures to potential foreign markets. An invaluable marketing network has been built up that he is intimately familiar with.”

“If he’s so important, why wouldn’t your Dr. Cranshaw give him a piece of the action? That’s not so uncommon, is it, in new-venture, high-tech companies?” Marshall asked.

“This is true, James. Important staff members are often compensated partially with stock. But the reason is to allow the company to pay these key employees less, since they *are* start-up and usually are not well-financed. Also, the stock options ensure their sense of having a stake in the successful completion of their work. In the case of AJC Fusion, Dr. Cranshaw is a successful entrepreneur with considerable financial resources through his other companies. He pays very well. And he is very firm about not diluting his controlling interest in the company. Dr. Cranshaw’s recruiting strategy has been very simple. Find the best, and as I said, he pays his executives very well. As for the technical staff, they are motivated by a calling other than money.

“Philip is . . . was very important to this company. But as Dr. Cranshaw has said on the few occasions dealing with this issue, AJC Fusion is not a whaling ship, and he doesn’t pay with shares in the cargo in the hold.”

“One more question, Sylvia. I get that you are using fusion in a unique way, not for heat but for neutrons. I get the whole chain of accomplishments including the fuel cells and why. But I don’t get the DC—the direct current—that you will get. Thomas Edison lost that battle a long time ago when he fought it out with George Westinghouse who, of course, favored AC—alternating current—and for good reason. Overland transmission of electricity is more efficient as AC than as DC. How do you plan to get around that problem?”

Sylvia Carlyle smiled. “Good question. Naturally we anticipated this problem. The entire electrical infrastructure is designed for alternating current and the electrical energy generated at the main production plants will be converted from DC to AC with only a minimal loss in efficiency due to that exchange. Locally, homes and businesses can simply continue to use alternating current. You know of course that all higher uses of electricity, that is, uses for more than simply creating heat, use direct current. Every single electronic device from audio systems to computers to . . . well, you name it—they all use direct current internally. They all have an internal circuit to turn the AC to DC so logical circuits can be used that cannot be used with alternating current. At the device level, it’s always direct current being used. Eventually, at the neighborhood level, it may be direct current that enters the home. It’s not a problem.”

Stopping at an office door, before entering, she explained, “This is Dr. Allen Lewis’s office. Dr. Lewis will explain how we study the surface instabilities of the imploding spherical target. As you know, he won the Nobel Prize in physics for his work on modeling hypersonic shock waves in the solar atmosphere.”

Allen Lewis was about fifty years old, slightly on the heavy side, and completely bald. He wore silver wire-frame glasses that he took off and put on frequently when in thought, slowly opening and closing them unconsciously.

After the initial introductions, Marshall asked, “Dr. Lewis, I appreciate your taking time to talk with me. May I ask you a practical question first before we discuss your work? How can a man of your public visibility be working here and no one seems to know anything about it?”

“Well,” he began in a soft Southern accent, “you’d be surprised about the paucity of public visibility between awards. You know, in science, particularly in leading-edge work, priority is the key. Coming in second just doesn’t count for much. You learn to keep your mouth shut about your work, except, of course, if you need help. In the science business you keep a low profile on your progress until you’re ready to report your success. I can do what I’m doing because of the low profile of this company. The big laboratories, the university or government labs who know

what we're about here have never been much interested in talking about us. They just don't want to be creating a mantle of legitimacy for us that their recognition would imply. So they share data with us because we're good and we give them just enough to keep them interested and to keep an historic trail, you know, in case a priority war breaks out among us boys over who did what first. But they don't really want to talk publicly about us. Pure science isn't as pure as we like to think, Mr. Marshall.”

When Lewis finished, Sylvia added, “As for the company's potential markets, they don't talk a lot about us because to them we're a high flier. They like what they hear, but they don't really believe it. Some don't even understand it. It's something in their speculative portfolio of future options. They just don't have any good reason to discuss this project in detail. Their expectations are low and their interest is purely long-term.”

Smiling, she added, “So we have been able to advance in relative obscurity. This has been our wish. Dr. Cranshaw is, after all, the crackpot chairman of a half-baked company, right James?”

Marshall squirmed visibly in his seat as he realized that Cranshaw was a lot tighter with Dick Scully than he thought. He would keep his private opinions more to himself from now on.

“Don't be embarrassed, James. That is exactly the image Dr. Cranshaw worked very hard to project, except to those people we choose to show the truth. Why don't we go into the lab and see what Dr. Lewis has been accomplishing.”