Title: The Bramble Bush

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The Bramble Bush

**Usually, if a man's gotten into bad trouble
by getting into something,
he's a fool to go back. But there are times ...**

by Randall Garrett

Illustrated by Schelling

There was a man in our town,
And he was wond'rous wise;
He jumped into a bramble bush,
And scratch'd out both his eyes!
—Old Nursery Rhyme

Peter de Hooch was dreaming that the moon had blown up when he awakened. The room was dark except for the glowing night-light near the door, and he sat up trying to separate the dream from reality. He focused his eyes on the glow-plate. What had wakened him? Something had, he was sure, but there didn't seem to be anything out of the ordinary now.

The explosion in his dream had seemed extraordinarily realistic. He could still remember vividly the vibration and the *cr-r-r-ump!* of the noise. But there was no sign of what might have caused the dream sequence.

Maybe something fell, he thought. He swung his legs off his bed and padded barefoot over to the light switch. He was so used to walking under the light lunar gravity that he was no longer conscious of it. He pressed the switch, and the room was suddenly flooded with light. He looked around.

Everything was in place, apparently. There was nothing on the floor that shouldn't be there. The books were all in their places in the bookshelf. The stuff on his desk seemed undisturbed.

The only thing that wasn't as it should be was the picture on the wall. It was a reproduction of a painting by Pieter de Hooch, which he had always liked, aside from the fact that he had been named after the seventeenth-century Dutch artist. The picture was slightly askew on the wall.

He was sleepily trying to figure out the significance of that when the phone sounded. He walked over and picked it up.

"Yeah?"

"Guz? Guz? Get over here quick!" Sam Willows' voice came excitedly from the instrument.

"Whatsamatter, Puss?" he asked blearily.

"Number Two just blew! We need help, Guz! Fast!"

"I'm on my way!" de Hooch said.

"Take C corridor," Willows warned. "A and B caved in, and the bulkheads have dropped. Make it snappy!"

"I'm gone already," de Hooch said, dropping the phone back into place.

He grabbed his vacuum suit from its hanger and got into it as though his own room had already sprung an air leak.

Number Two has blown! he thought. That would be the one that Ferguson and Metty were working on. What had they been cooking? He couldn't remember right off the bat. Something touchy, he thought; something pretty hot.

But that wouldn't cause an atomic reactor to blow. It obviously hadn't been a nuclear blow-up of any proportions, or he wouldn't be here now, zipping up the front of his vac suit. Still, it had been powerful enough to shake the lunar crust a little or he wouldn't have been wakened by the blast.

These new reactors could get out a lot more power, and they could do a lot more than the old ones could, but they weren't as safe as the old heavy-metal reactors, by a long shot. None had blown up yet—quite—but there was still the chance. That's why they were built on Luna instead of on Earth. Considering what they could do, de Hooch often felt that it would be safer if they were built out on some nice, safe asteroid—preferably one in the Jovian Trojan sector.

He clamped his fishbowl on tight, opened the door, and sprinted toward Corridor C.

The trouble with the Ditmars-Horst reactor was that it lacked any automatic negative-feedback system. If a D-H decided to go wild, it went wild. Fortunately, that rarely happened. The safe limits for reactions were quite wide—wider, usually, than the reaction limits themselves, so that there was always a margin of safety. And within the limits, a nicety of control existed that made nucleonics almost an esoteric branch of chemistry. Cookbook chemistry, practically.

Want deuterium? Recipe: To 1.00813 gms. purest Hydrogen-1 add, slowly and with care, 1.00896 gms. fine-grade neutrons. Cook until well done in a Ditmars-Horst reactor. Yield: 2.01471 gms. rare old deuterium plus some two million million million ergs of raw energy. Now you are cooking with gas!

All you had to do was keep the reaction going at a slow enough rate so that the energy could be bled off, and there was nothing to worry about. Usually. But control of the feebleizer fields still wasn't perfect, because the fields that enfeebled the reactions and made them easy to control weren't yet too well understood.

Peter de Hooch turned into Corridor C and kept on running. There was plenty of air still in this corridor, and there was apparently little likelihood of his needing his vac suit. But on the moon nobody responds to an emergency call without a vac suit.

He was troubled about Corridors A and B. The explosion must have been pretty violent to have sealed off two of the four corridors leading from the living quarters to the reaction labs. Two corridors went directly to one of the reactors, two went directly to the second. Two more connected the reactor labs themselves, putting the labs and the living quarters at the corners of an equilateral triangle. (Peter had never been able to figure out why A and B corridors led to Reactor Two, while C and D led to Reactor One. Logically, he thought, it should have been the other way around. Oh, well.)

Going down C meant that he'd have to get to Reactor Two the long way around.

What had the damage been? he asked himself. Had anyone been hurt? Or killed? He pushed the questions out of his mind. There was no point in speculating. He'd have the information soon enough.

He took the cutoff to the left, at a sixty-degree angle to Corridor C, which led him directly to Corridor E, by-passing Reactor One. He noticed as he went by that the operations lamp was out. Nobody was working with Reactor One.

As he pounded on down the empty corridor, he suddenly realized that he hadn't seen anyone else running with him. There were five other men in the reactor station, and—so far—he had seen no one. He knew where Willows was, but where were Ferguson, Metty, Laynard, and Quillan? He pushed those questions out of his mind, too, for the time being.

A head popped out of the door at the far end of the corridor.

"Guz! *Hurry*, Guz!"

De Hooch didn't bother to answer Willows. He was short of breath as it was. He knew, besides, that no answer was expected. He had known Willows for years, and knew how he thought. It was Willows who had first tagged de Hooch with that silly nickname, "Guzzle". Not because Peter was such a heavy drinker—although he could hold it like a

gentleman—but because he had thought "Guzzle" de Hooch was so uproariously funny. "Nobody likes a guzzle as well as de Hooch," he'd say, with an idiot grin. As a result, everybody called Peter "Guz" now.

The head had vanished back into the control room of Reactor Two. De Hooch kept on running, his breath rasping loudly in the confines of the fishbowl helmet. Running four hundred yards isn't the easiest thing in the world, even if a man is in good physical condition. There was less weight to contend with, but the mass that had to be pushed along remained the same. The notion that running on Luna was an effortless breeze was one that only Earthhuggers clung to.

He ran into the control room and stopped, panting heavily. "What ... happened?"

Sam Willows' normally handsome face looked drawn. "Something went wrong. I don't know what. I was finishing up with Reactor One when I heard the explosion. They are both"—he gestured toward the reactor—"both in there."

"Still alive?"

"I think so. One of 'em, anyway. Take a look."

De Hooch went over to the periscope and put his eyes to the binoculars. He could see two figures in heavy, dull-gray radiation-proof suits. They were lying flat on the floor, and neither was moving. De Hooch said as much.

"The one on the left was moving his arm—just a little," Willows said. "I'll swear he was."

Something in the man's voice made de Hooch turn his head away from the periscope's eyepieces. Willows' face was gray, and a thin film of greasy perspiration reflected the light from the overhead plates. The man was on the verge of panic.

"Calm down, Puss," de Hooch said gently. "Where's Quillan and Laynard?"

"They're in their rooms," Willows said in a tight voice. "Trapped. The bulkheads have closed 'em off in A. No air in the corridor. We'll have to dig 'em out. I called 'em both on the phone. They're all right, but they're trapped."

"Did you call Base?"

"Yes. They haven't got a ship. They sent three moon-cats, though. They ought to be here by morning."

De Hooch looked up at the chronometer on the wall. Oh one twelve, Greenwich time. "Morning" meant any time between eight and noon; the position of the sun up on the surface had nothing to do with Lunar time. As a matter of fact, there was a full Earth shining at the moment, which meant that it wouldn't be dawn on the surface for a week yet.

"If the cats from Base get here by noon, we'll be O.K., won't we?" de Hooch asked.

"Look at the instruments," Willows said.

De Hooch ran a practiced eye over the console and swallowed. "What were they running?"

"Mercury 203," Willows said. "Half-life forty-six point five days. Beta and gamma emitter. Converts to Thallium 203, stable."

"What did they want with a kilogram of the stuff?"

"Special order. Shipment to Earth for some reason."

"Have you checked the end-point? She's building up fast."

"No. No. I haven't." He wet his lips with the tip of his tongue.

"Check it," said de Hooch. "Do any of the controls work?"

"I don't know. I didn't want to fiddle with them."

"You start giving them a rundown. I'm going to get into a suit and go pull those two out of there—if they're still alive." He opened the locker and took his radiation-proof suit out. He checked it over carefully and began shucking his vac suit.

A few minutes delay in getting to the men in the reactor's anteroom didn't matter much. If they hadn't been killed outright, and were still alive, they would probably live a good deal longer. The shells of the radiation suits didn't look damaged, and the instruments indicated very little radiation in the room. Whatever it was that had exploded had done most of its damage at the other end of the reactor. Evidently, a fissure had been opened to the surface, forty feet above—a fissure big enough to let all the air out of A and B corridors, and activate the automatic bulkheads to seal off the airless section.

What troubled him was Willows. If he hadn't known the man so well, de Hooch would have verbally blasted him where he stood.

His reaction to trouble had been typical. De Hooch had already seen Willows in trouble three times, and each time, the reaction had been the same: near panic. Every time, his first thought had been to scream for help rather than to do anything himself. Almost anyone else would have made one call and then climbed into a radiation suit to get Ferguson and Metty out of the anteroom. There was certainly no apparent immediate danger. But all that Willows had done was yell for someone to come and do his thinking and acting for him. He had called Base; he had called de Hooch; he had called Quillan and Laynard. But he hadn't done anything else.

Now he had to be handled with kid gloves. If de Hooch didn't act calm, if he didn't go about things just right, Willows might very likely go over the line into total panic. As long as he had someone to depend on, he'd be all right, and de Hooch didn't want to lose the only help he had right now.

"Fermium 256," said Willows in a tight, flat voice.

"What?" de Hooch asked calmly.

"Fermium 256," Willows repeated. "That's what the stuff is going to start building towards. Spontaneous fission. Half-life of three hours." He took a deep breath. "The reactor won't be able to contain it. We haven't got that kind of bleed-off control."

"No," de Hooch agreed. "I suggest we stop it."

"The freezer control isn't functioning," Willows said. "I guess that's what they went in there to correct."

"I doubt it," de Hooch said carefully. "They wouldn't have needed suits for that. They must have had something else bothering them. I'd be willing to bet they went in to pull a sample and something went wrong."

"Why? What makes you think so?"

"If there'd been trouble, they'd have called for someone to stay here at the console. Both of them wouldn't have gone in if there was any trouble."

"Yeah. Yeah, I guess you're right." He looked visibly relieved. "What do you suppose went wrong?"

"Look at your meters. Four of 'em aren't registering."

Willows looked. "I hadn't noticed. I thought they were just registering low. You're right, though. Yeah. You're right. The surface bleed-off. Hydrogen loss. Blew a valve, is all. Yeah." He grinned a little. "Must've been quite a volcano for a second or two."

De Hooch grinned back at him. "Yeah. Must've. Give me a hand with these clamps."

Willows began fastening the clamps on the heavy suit. "D'you think Ferguson and Metty are O.K., Guz?" he asked.

De Hooch noticed it was the first time he had used the names of the two men. Now that there was a chance that they were alive, at least in his own mind, he was willing to admit that they were men he knew. Willows didn't want to think that anyone he knew had done such a terrible thing as die. It hit too close to home.

The man wasn't thinking. He was willing to grasp at anything that offered him a chance—dream straws. The idea was to keep him busy, keep his mind on trivia, keep him from thinking about what was going on inside that reactor.

He should have known automatically that it was building toward Fermium 256. It was the most logical, easiest, and simplest way for a D-H reactor to go off the deep end.

A Ditmars-Horst reactor took advantage of the fact that any number can be expressed as the sum of powers of two—and the number of nucleons in an atomic nucleus was no exception to that mathematical rule.

Building atoms by adding nucleons wasn't as simple as putting marbles in a bag because of the energy differential, but the energy derived from the fusion of the elements lighter than Iron 56 could be compensated for by using it to pack the nuclei heavier than that. The trick was to find a chain of reactions that gave the least necessary energy transfer. The method by which the reactions were carried out might have driven a mid-Twentieth Century physicist a trifle ga-ga, but most of the reactions themselves would have been recognizable.

There were several possible reactions which Ferguson and Metty could have used to produce Hg-203, but de Hooch was fairly sure he knew which one it was. The five-branch, double-alpha-addition scheme was the one that was easiest to use—and it was the only one that started the damnable doubling chain reaction, where the nuclear weights went up exponentially under the influence of the peculiar conditions within the reactor. 2-4-8-16-32-64-128-256 ... Hydrogen 2 and Helium 4 were stable. So were Oxygen 16 and Sulfur 32. The reaction encountered a sticky spot at Beryllium 8, which is highly unstable, with a half life of ten to the minus sixteenth seconds, spontaneously fissioning back into two Helium 4 nuclei. Past Sulfur 32, there was a lot of positron emission as the nuclei fought to increase the number of neutrons to maintain a stable balance. Germanium 64 is not at all stable, and neither is Neodymium 128, but the instability can be corrected by positive beta emission. When two nuclei of the resulting Xenon 128 are forced together, the positron emission begins long before the coalescence is complete, resulting in Fermium 256.

But not even a Ditmars-Horst reactor can stand the next step, because matter itself won't stand it—not even in a D-H reactor. The trouble is that a D-H reactor *tries*. Mathematically, it was assumed that the resulting nucleus did exist—for an infinitesimal instant of time. Literally, mathematically, infinitesimal—so close to zero that it would be utterly impossible to measure it. Someone had dubbed the hypothetical stuff Instantanium 512.

Whether Instantanium 512 had any real existence is an argument for philosophers only. The results, in any case, were catastrophic. The whole conglomeration came apart in a grand splatter of neutrons, protons, negatrons, positrons, electrons, neutrinos—a whole slew of Greek-lettered mesons of various charges and masses, and a fine collection of strange and ultrastrange particles. Energy? Just oodles and gobs.

Peter de Hooch had heard about the results. He had no desire to experience them first hand. Fortunately, the reaction that led up to them took time. It could be stopped at any time up to the Fm-256 stage. According to the instruments, that wouldn't be for another six hours yet, so there was nothing at all to worry about. Even after that it could be stopped, provided one had a way to get rid of the violently fissioning fermium.

"Connections O.K.?" Willows asked. His voice came over the earphones inside the ponderous helmet of the radiation suit.

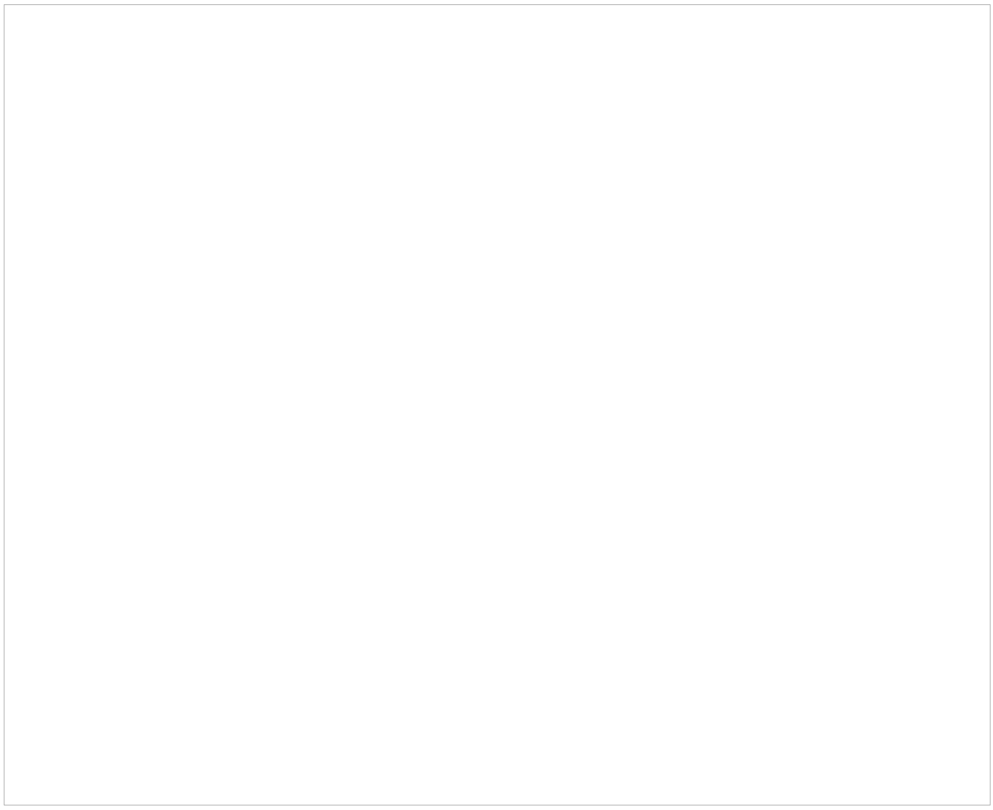
"Fine," said de Hooch. He adjusted the double periscope so that his vision was clear. "Perfect."

He tested the controls, moving his arms and legs to see if the suit responded. The suit was so heavy that, without powered joints, controlled by servomechanisms, he would have been unable to move, even under Lunar gravity. With the power on, though, it was no harder than walking underwater in a diving suit. "All's well, Puss," he said.

"I'll keep an eye on you," said Willows.

"Fine. Well, here goes Colossus de Hooch." He began walking toward the door that led into the corridor which connected the reactor anteroom to the control room.

It took time to drag the two inert figures out of the anteroom. All de Hooch could do was grab them under the armpits, apply power, and drag them out. He went out the same way he had come in, traversing the separate chambers in reverse order. First came the decontamination chamber, where the radioactive dust that might have settled on the suits was sluiced off by the detergent sprays. When the radiation detectors registered low enough, de Hooch dragged Ferguson into the outer chamber, then went back and got Metty and put him through the same process. Then he dragged them on into the control room so that Willows could get them out of the heavy suits.



"Can you help me, Guz?" Willows asked. It was obvious that he didn't want to open the suits. He didn't want to see what might be inside. De Hooch helped him.

They were both alive, but unconscious. Bones had been broken, and Metty appeared to be suffering from concussion. They were badly damaged, but they'd live.

De Hooch and Willows made two trips down E and C corridors, carrying the men on a stretcher, to get them in bed. De Hooch splinted the broken bones as best he could and gave each of them a shot of narcodyne. He had to do the medical work because Quillan, the medic, was trapped in Corridor A. He called Quillan on the phone to tell him what had happened. He described the signs and symptoms of the victims as best he could, and then did what Quillan told him to do.

"They ought to be all right," Quillan said. "With that dope in them, they'll be out cold for the next twelve hours, and by that time, the boys from Base will be here. Just leave 'em alone and don't move 'em any more."

"Right. I'll call you back later. Right now, Puss and I are going to see what's wrong with the control linkages on Number Two."

"Right. By-o."

De Hooch and Willows walked back to the control room of Number Two Reactor in silence.

Once inside the control room, de Hooch said: "How are those control circuits?" Willows was supposed to have been checking them while he had been dragging Ferguson and Metty out of the antechamber.

"Well, I ... I'm not sure. I'll show you what I've found so far, Guz. You ought to take a look at them. I ... I'd like you to take a look-see. I think"—he gestured toward the console—"I think they're all right except for the freezer vernier and the pressure release control."

He doesn't trust his own work, de Hooch thought. *Well, that's all right. Neither do I.*

Painstakingly, the two of them went over the checking circuits. Willows was right. The freezer and pressure controls were inoperable.

"Damn," said de Hooch. "Double damn."

"They're probably both stuck at the firewall," Willows said.

"Sure. Where else? I'll have to go in there and unstick 'em. Help me get back into that two-legged tank again." He wished he knew more about what Ferguson and Metty had been doing. He wished he knew why the two men had gone into the anteroom in the first place. He wished a lot of things, but wishing was a useless pastime at this stage of the game.

If only one of the two men had been in a condition to talk!

He got back into his radiation-proof suit again, took one last look at the instruments on the console, and headed for the reactor.

Through the first radiation trap—left turn, right turn, right turn, left turn—through the "cold" room, through the second radiation trap, through the decontamination chamber, and through the third radiation trap into the anteroom. Now that Ferguson and Metty were safely out of the way, he could give his attention to the damage that had been done.

Had Ferguson and Metty actually come in to tap off a sample, as he had suggested to Willows? He looked around at the wreckage in the antechamber. Quite obviously, the heavy door of the sample chamber was wide open, and it certainly appeared that the wreckage was scattered from that point. Cautiously, he went over to look at the open sample chamber. It looked all right, except that the bottom was covered with a bright, metallic dust. He rubbed his finger over it and looked at the fingertip. A very fine dust. And yet it hadn't been scattered very much by the explosion. Heavy. Very likely osmium. Osmium 187 was stable, but it wasn't a normally used step toward Mercury 203. Four successive alpha captures would give Polonium 203, not mercury. Ditto for an oxygen fusion. It could be iridium or platinum, of course. Whatever it was, the instruments in his helmet told him it wasn't hot.

He had a hunch that Ferguson and Metty had been building Mercury 203 from Hafnium 179 by the process of successive fusions with Hydrogen 3 and that something had gone wrong with the H-3 production. It appeared that the explosion had been a simple chemical blast caused by the air oxidation of H-2. But the bleeder vent at the other end of the reactor had apparently kicked at the same time. An enormous amount of unused energy had been released, blowing the entire emergency bleeder system out.

Something didn't seem right. Something stuck in his craw, and he couldn't figure out what it was.

He opened up the conduit boxes that led through the antechamber from the control console to the reactor beyond the firewall. Everything looked fine. That meant that whatever it was that had fouled up the controls was on the other side of the firewall.

"How does it look?" Willows' voice came worriedly over the earphones.

"Have I already said 'damn'?" de Hooch asked.

"You have," Willows said with forced lightness. "You even said 'double damn'."

"*Factorial* damn, then!" said de Hooch.

"What's the matter?"

"Apparently the foul-up is on the *other* side of the firewall."

"Are you going in?"

"I'll have to."

"All right. Watch yourself."

"I will." He went over to the periscope that surveyed the part of the reactor beyond the firewall. Everything looked normal enough. He carefully checked the pressure gauge. Normal.

"Check the spectro for me, will you?" he asked. "Make sure that's just the normal helium atmosphere in there."

"Sure." A pause. "Nothing but helium, Guz. What were you expecting?"

"I don't think I'd care to walk into a hydrogen atmosphere at three hundred Centigrade."

"Neither would I, but how could there be hydrogen in there?"

"There shouldn't be. But there's something screwy going on here, and I can't put my finger on it."

"Well, whatever it is, it isn't hydrogen in the reactor room."

"O.K. Stand by. I'm going in."

He walked over to the firewall door. On the other side of it was a small chamber where the oxygen and nitrogen of normal air would be swept out before he opened the inner door to go into the inner chamber itself. There was no need for an air lock, since small amounts of impurities in the He-4 didn't bother anything.

It was just as he turned the lever that undogged the firewall door that he realized his mistake.

But it was too late.

The door jerked outward, and a hot wind picked him up and slammed him against the far wall.

There was a moment of pain.

Then—nothing.

There was something familiar about the man who was turning the wheel, but de Hooch couldn't place it. The man was wearing a black hood, as befitted a torturer and executioner.

"Idiot," said the hooded man, giving the wheel of the rack a little more pressure, "explain the following: If a half plus a half is equal to a whole, why is halfnium plus halfnium not equal to wholmium?"

Stretched as he was on the rack, de Hooch could not think straight because of the excruciating pain.

"Because a half is eight point two eight per cent heavier than a hole," said de Hooch.

"You are an idiot, none the less," said the torturer. He gave the wheel another twist. De Hooch wanted to scream, but he couldn't.

"Try again," said the torturer. "What is a half plus four plus four plus four plus four plus—"

"Stop!" *screamed de Hooch.* "Stop! *Stop at the osmium!*"

"Ah! But it didn't *stop at the osmium," said the hooded man. "It went on and on and on. Plus four plus four plus four plus four plus four—until there were so many plus fours in there that the place looked like an old-fashioned golf course."*

"My legs hurt," said de Hooch. The man was no longer wearing a hood, but de Hooch couldn't tell if it was Willows or himself.

"We will all go together when we go," said the man.

De Hooch turned his head away and looked at the ceiling.

And he realized that it was the ceiling of the antechamber.

"My legs hurt," he repeated. And he could hear the hoarse whisper inside the helmet. He realized that he was lying flat on his back. He had been jarred around quite a bit in the suit.

He wondered if he could sit up. He managed to get both arms behind him and push himself into a sitting position. He

wiggled his feet. The servos responded. He hurt all over, but a little experiment told him that he was only bruised. Nothing was broken. He hadn't been hit as hard as Ferguson and Metty had been.

"Willows?" he said. "Willows?"

There was no answer from the earphones.

He looked at the chronometer dial inside his helmet. Oh two forty-nine. He had been unconscious less than ten minutes.

The same glance brought his eyes to two other dials. The internal radiation of the suit was a little high, but nothing to worry about. But the dial registering the external radiation was plenty high. Without the protection of the suit, he wouldn't have lived through those ten minutes.

Where was Willows?

And then he knew, and he pushed any thought of further help from that quarter out of his mind. What had to be done would have to be done by Peter de Hooch alone. He climbed to his feet.

His head hurt, and he swayed with nausea and pain. Only the massive weight of the suit's shoes kept him upright. Then it passed, and he blinked his eyes and shook his head to clear it. He found he was holding his breath, and he let it out.

The trouble had been so simple, and yet he hadn't seen it. Oh, yes, he had! He*must* have, subconsciously. Otherwise, how would he have guessed that the stuff in the sampling chamber was Osmium 187? Ferguson and Metty*had* been trying to make Mercury 203 by adding eight successive tritium nuclei to Hafnium 179, progressing through Tantalum 182, Tungsten 185, Rhenium 188, Osmium 191, Iridium 194, Platinum 197, and Gold 200, all of which were unstable.

But the Hydrogen 3 reaction had gone wrong. The doubling had set in, producing Helium 4. Successive additions of the alpha particles to Hafnium 179 had produced, first, Tungsten 183, and then Osmium 187, both of which were stable.

Ferguson and Metty, seeing that something was wrong, drew off a sample and then reset the reaction to produce the Hg-203 they wanted. Then they had come down to pick up the sample.

They hadn't realized that the helium production had gone wild. Much more helium than necessary was being produced, and the bleeder valve had failed. When they opened the sample chamber, they got a blast of high-pressure helium right in the face. The shock of that sudden release had jarred the whole atmosphere inside the reaction chamber, and the bleeder valve had let go. But the violence of the pressure release had caused a fault to the surface to open up and had closed the valve again—jammed it, probably. There had been enough pressure left in there to blow de Hooch up against the nearest wall when he opened the door. Since the pressure indicator system was connected to the release system, when one had failed, the other had failed. That's why the pressure gauge had indicated normal.

And, of course, it had been the pressure differential that had caused the controls to stick. Well, they ought to be all right now, then. He decided he'd better take a look.

The firewall door was still open. He walked over to it and stepped into the small chamber that led to the inner reactor room. The inside door, much weaker than the outer firewall door, had been blown off its hinges. He stepped past it and went on in.

What he saw made him jerk his glance away from the periscope in his helmet and check his radiation detectors again. Not much change. Relief swept over him as he looked back at the reactor itself. The normally dead black walls were glowing a dull red. It was pure thermal heat, but it shouldn't be doing that.

Moving quickly, he went over to the place where the control cables came in through the firewall. It took him several minutes to assure himself that they would function from the control room now. There was nothing more to do but get out of here and get that reaction damped.

He went out again, closing the firewall door behind him and dogging it tight. There would be no more helium production now.

He went through the radiation trap to the decontamination chamber to wash off whatever it was he had picked up.

The decontamination room was a mess.

De Hooch stared at the twisted pipes and the stream of water that gushed out of a cracked valve. The blast had jarred everything loose. Well, he could still scrub himself off.

Except that the scrubbers weren't working.

He swore under his breath and twisted the valve that was supposed to dispense detergent. It did, thank Heaven. He doused himself good with it and then got under the flowing water.

The radiation level remained exactly where it was.

He walked over and pulled one of the brushes off the defunct scrubber and sudsed it up. It wasn't until he started to use

it that he got a good look at his arms. He hadn't paid any attention before.

He walked over to the mirror to get a good look.

"You look magnificent," he told his reflection acidly.

The radiation-proof armor looked as though it had been chrome plated.

But de Hooch knew better than that. He knew exactly what had happened. He was nicely plated all over with a film of mercury, which had amalgamated itself with the metallic surface of the suit. He was thoroughly wet with the stuff and no amount of water and detergent would take it off.

There was something wrong with Number Two Reactor, all right. It had leaked out some of the Mercury 203 that Ferguson and Metty had been making.

He thought a minute. It hadn't been leaking out just before he opened the door in the firewall, because Willows would certainly have noticed the bright mercury line when he checked with the spectroscope. The stuff must have been released when the pressure dropped.

He walked back to the anteroom and looked at the sampling chamber. There were a few droplets of mercury around the inlet.

Thus far, the three pressure explosions had wrecked about everything that was wreckable, he thought. No, not quite. There was still the chance that the whole station would go if he didn't get back into the control room and stop that "powers of two" chain. The detonation of Instantanium 512 would finish the job by doing what high-pressure helium could never do.

He glanced at the thermometer. The temperature behind the firewall had risen to two-forty Centigrade. It wasn't supposed to be above two hundred. It wasn't too serious, really, because a little heat like that wouldn't bother a Ditmars-Horst reactor, but it indicated that things back there weren't working properly.

He turned away and walked back to the decontamination chamber. There must be some way he could get the mercury off the suit—because he couldn't take the suit off until the mercury was gone.

First, he tried scrubbing. That was what showed him how upset he really was. He had actually scrubbed the armor on his left arm free of mercury when he realized what he was doing and threw the brush down in disgust.

"Use your head, de Hooch!" he told himself. What good would it do to scrub the stuff off of the few places he could reach? In the bulky armor, he was worse than muscle-bound. He couldn't touch any part of his back; he couldn't bend far enough to touch his legs. His shoulders were inaccessible, even. Scrubbing was worse than useless—it was time-wasting.

He picked up the brush again and began scrubbing at the other arm. It gave him something to do while he thought. While he was thinking, he wasn't wasting time.

What would dissolve mercury? Nitric acid. Good old HNO_3. Fine. Except that the hot lab was at the other end of the reactor, where the fissure had let all the air out. The bulkheads had dropped, and he couldn't get in. And, naturally, the nitric acid would be in the lab.

For the first time, he found himself hating Willows' guts. If he were around, he could get some acid from the cold lab, or even from the other hot lab at Number One. If Willows—

He stood up and dropped the brush. "Dolt! Boob! Moron! Idiot!" Not Willows. Himself. There was no reason on earth—or Luna—why he couldn't walk over to Number One hot lab and get the stuff himself. The habit of never leaving the lab without thorough decontamination was so thoroughly ingrained in him that he had simply never thought about it until that moment. But what did a little contamination with radioactive mercury mean at a time like this? He could take F corridor to Number One, use the decontamination chamber and the acid from the lab, shuck off his armor there, and come back through E corridor. F could be cleaned up later.

So simple.

He went through the light trap to the next chamber and turned the handle on the sliding door. The door wouldn't budge. It had been warped by the force of the helium blast, and it was stuck in its grooves.

Well, there were tools. The thing could be unstuck.

Peter de Hooch was a determined man, a strong man, and a smart man. But the door was more determined and stronger than he was, and his intelligence didn't give him much of an edge right then. After an hour's hard work, he managed to get the door open about eighteen inches. Then it froze fast and refused to move again. All the power and leverage he could bring to bear was useless. The door had opened all it was going to open. Beyond it, he could see the next radiation trap—and freedom.

Eighteen inches would have been plenty of space for him to get through if he had not been wearing the radiation-proof suit. But he didn't dare take that suit off. By the time he got out of the suit, the intensely radioactive mercury on its surface would have made his death only a matter of time. And not much time at that.

He told himself that if it were simply a matter of running to the control room to shut off the D-H reactor, he'd do it. That could have been done before he lost consciousness. But it wasn't that easy. Damping the reaction took time and control. The stuff had to be eased back slowly. Shutting off the Ditmars-Horst would simply blow a hole in the crust of Luna and kill everyone if he did it now. There were four or five men out there who would die if he pulled anything foolish like that. The explosion wouldn't be as powerful as the Instantanium 512 reaction would be, but it would be none the less deadly for all that.

There had to be either a way to scrape the mercury off the suit or a way to open the door another six inches.

Or, he added suddenly, a way to get safely out of the suit.

At the end of another twenty minutes, he had still thought of nothing. He wandered around the decontamination room, looking at everything, hoping he might see something that would give him a clue. He didn't.

He went into the antechamber of the reactor and glared at the door in the firewall. The instruments said that things were getting pretty fierce on the other side of that wall. Temperature: Two ninety-five and still rising. Pressure? He carefully cracked the inlet of the sampling chamber and got a soft hiss. The helium was expanding from the heat, that was all. Part of the trouble with the reactor, he thought, was the high percentage of oxygen and nitrogen that had mixed in during the ten minutes or so that the door was open. All hell was fixing to bust loose in there, and he, Peter de Hooch, was right next to it.

He walked back into the decontamination chamber.

What would dissolve mercury?

Mercury would dissolve gold. Would gold dissolve mercury?

Very funny.

He was like a turtle, de Hooch thought. Perfectly safe as long as he was in his shell, but take him out of it and he would die.

Hell of a way to spend the night, he thought. *A night in shining armor.*

That struck him as funny. He began to laugh. And laugh.

He almost laughed himself sick before he realized that it was fear and despair that were driving him into hysteria, not a sense of humor. He forced himself to calmness.

He must be calm.

He must think.

Yes.

How do you go about getting rid of a radioactive metal that is in effect welded to the outside of your suit?

The trouble was, he was a nucleonics engineer, not a chemist. He remembered quite a bit of his chemistry, of course, but not as much as he would have liked.

Could the stuff be neutralized?

Sure, he told himself. Very simple. All he had to do was go climb into the reactor, and let the reactor do the job. Mercury 203 plus an alpha particle gives nice, stable Lead 207. Just go climb right into the Ditmars-Horst and let the Helium 4 do the job.

But the thought stuck in his mind.

He kept telling himself not to panic as Willows had done.

And several minutes later, chuckling to himself in a half demented fashion, he opened the firewall door and went in to let the helium do the job.

It was nearly eight in the morning, Greenwich time, when the three surface vehicles, with their wide Caterpillar treads lumbered to a halt near the kiosk that marked the entrance to the underground site of the laboratories.

"O.K.," said one of the men in the first machine, holding a microphone to his lips, "let's go in. If what Willows said is true, the whole place may blow any minute now, but I'm not asking for volunteers. Nobody will be any safer up here than they will down there, and we have to do a job. Besides, Willows wasn't completely rational. Nobody would put on

a vac suit and run away like that if he was in his right mind. So we can discount a lot of what he said when we picked him up on the road.

"The five of us in this car are going straight to Number One Reactor to see what can be done to stop whatever is going on. The rest of you start trying to see if you can get those trapped men out of A and B corridors. All right, let's move in."

Less than five minutes later, five men went into the control room of Number One Reactor. They found Peter de Hooch sound asleep in the control chair, and the instruments showed that the Ditmars-Horst reactor was inactive.

One of the men shook de Hooch gently, awakening him in the middle of a snore.

"What?" he said groggily.

"We're here, Guz. Everything's O.K."

"Sure everything's O.K. Nothing to it. All I did was wait until the temperature got above three fifty-seven Centigrade—above the boiling point of mercury. Then I went in and let the hot helium *boil* the stuff off me. Nothing to it. Near boiled myself alive, but it did the trick."

"What," asked the man in a puzzled voice, "are you talking about?"

"I am a knight in dull armor," said Peter de Hooch, dozing off again.

Then he roused himself a little, and said, without opening his eyes: "Hi yo, Quicksilver, away." And he was sound asleep again.

And when he saw what he had done,
With all his might and main,
He jumped back in that bramble bush
And scratch'd them in again!...

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