

By ROBERT WICKS

Illustrated by DICK FRANCIS

First he had to know what he was, then who he was and why he was—but who was relying on the answers?

THE

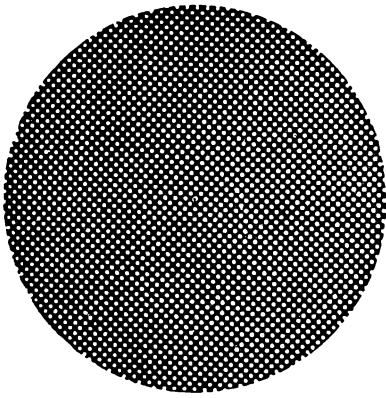
HE OPENED his eyes. He couldn't remember having ever seen humans before, but he recognized them instantly. Nor could he remember having seen anything before, yet he felt a warm familiarity with all that fell into view—the light panels set flush with the ceiling, the gleaming laboratory paraphernalia erected around the table on which he lay, electronic scanners probing his mind with invisible beams—but, most of all, the two men in white lab coats bending over him.

"Clench your fingers," ordered the shorter of the two humans.

Muscles tightened. Fingers clenched.

"Blink your eyes."

A quick reflex action.



IMPERSONATOR

The taller man leaned closer. "What is your name?"

Something tripped deep inside. "Paul Chandler."

The tall man smiled, but somehow the smile never reached his eyes. "Occupation?"

Again something tripped. "Geophysicist."

"And your specialty?"

"Glaciology."

"Your present assignment?"

"I have been appointed by the President of the World Council to head up Project Ice Thaw."

"Which is?"

"A program of weather control to combat the extensive glaciation threatening to plunge the Earth into another ice age. We meet next month in New San Francisco to get

final approval on a plan of action."

"And if the project fails?" asked the tall man.

"Catastrophe."

"Clench your fingers," said the shorter man.

Chandler could feel the energy pulse from his brain to his fingers.

"Blink your eyes."

He did so.

"Sit up."

Stiffly he obeyed.

"What manner of creature are you?" asked the tall man.

Something whirred deep in the recesses of Chandler's mind. "A man," he said at last. But he knew he was not.

The tall man depressed a series of buttons on a master control panel. There was a rushing in Chandler's ears, a blurring before his eyes.

The voice of the shorter man floated across a gray void.

"Clench your fingers," it said. "Blink your eyes."

The odd sensation passed and Paul Chandler found himself looking into the eyes of Marta Neilson. She half stood at the far end of the conference table.

"Are you sure you're all right?" she asked.

"Just a moment's dizziness," he said. "It's gone now."

Marta, partially reassured, sat down again.

AS CHANDLER poured himself a glass of water, he studied her clean features as he would a mathematical problem in topology. Add in her blue eyes and white skin, subtract her hair pulled back in a severe bun and her lack of makeup, and she approached the Swedish ideal of beauty.

Her natural magnetism and physical attractions had always stirred an emotion in Chandler, but, strangely enough, not now. She smiled and, automatically, he returned the smile.

"Mr. Chairman." The delegate from Canada frowned at Chandler. "We've debated the problem of causes for nearly two hours and seem to have reached an impasse."

A lean Britisher pushed his chair back. "If you were to

solicit my opinion, I'd say we'd reached an impasse before we entered this room."

A stocky Russian with weathered features shot a glance at the Englishman. "Was that remark directed at me?"

"I was under the impression," returned the Englishman, "that we were here to determine an immediate course of action. My government instructed me to work to that end. I do not know what your instructions were."

"My dear Dr. White—" the Russian began, but Chandler's gavel rapped firmly on the table.

"Surely," he said, "Professor Kotenko is willing to concede that a cold climate is not enough in itself to cause glaciation."

"I did not mean to imply that it was."

"There must be snowfall, and snowfall demands a source," Chandler continued.

"And that source is the Arctic Ocean," the Britisher threw in.

The Russian stood up. "Gentlemen," he said, "would you undo a century and a half of Soviet weather control? Would you destroy the Bering Strait Dam and the North Atlantic pumping stations?"

Dr. White stood up to face Kotenko. "If it would stop that infernal ice sheet, yes, by God!"

"It is easy for you to talk,"

the Russian fired back. "It is not British science that is being impugned."

"And it's not Soviet territory that's being threatened."

"A tribute to Soviet science," the Russian replied, smiling.

The Englishman's neck reddened.

CHANDLER rapped his gavel again. All eyes turned his way.

"We want Soviet and British science working hand-in-hand with the rest of us on this project. Anything less might spell disaster."

A murmur of approval greeted his words and the Englishman sat down. Professor Kotenko remained standing.

"You have the Soviet plan before you," he directed at Chandler.

"I've read it," said Chandler, glancing down at the document neatly bound in manuscript covers. "An interesting idea—increasing the greenhouse effect by adding carbon dioxide to the upper atmosphere. But the amount that could be added would only raise the temperature by a few degrees. Since snowfall increases considerably at the warmer temperatures close to the freezing point, we would only be compounding our problem."

Kotenko's features stiffened. "The plan also includes

changing the albedo of the ice by coating it with coal dust. Not only would this raise the mean temperature, it would melt the—"

"What happens when it snows over your precious coal dust?" the Britisher cut in.

"We are suggesting a continuous dusting program." The Russian took his seat.

"The plan is not without merit," Chandler said. "However, we've received almost as many plans as there are members on this commission."

"Why not try all of them?" asked the Indonesian delegate.

"Or, at least, a program involving several," Marta Neilson modified. "Atomic heat and possibly infra-red radiation."

"We can't spread our efforts that thin," Chandler explained to the young woman. "Any one of these plans demands a concentration of money and effort such as the world has never known."

"And one thing strikes me," Dr. White put in. "None of these plans hits at the basic cause. They all treat symptoms, save for the Canadian proposal, which is quite out of the question."

"Are you getting back to freezing the Arctic Ocean again?" Kotenko challenged.

"One X-bomb on the Bering Strait Dam," the Englishman said.

"My dear Dr. White," returned the Russian, "the

X-factor is best left under international ban."

THE Englishman turned to the Canadian delegate. "Is it? Perhaps this is the time to screen your stop-motion studies of the destruction of Ottawa."

"What purpose could that possibly serve?" Kotenko protested. "We've all seen the glacier first-hand."

"It might well underscore the need for more action and less talk."

"Then," said the Indian delegate, "by all means, let's see them." Again there was a murmur of approval.

As the delegates rearranged their chairs to face the view-wall at the far end of the conference room, the Canadian pushed a button on a control console in front of him. The room lights dimmed.

"This study was recorded at the rate of one frame a day by the Canadian Glacial Control Commission. Tonight it will be released over the World Video Network. While everyone has seen pictures of what is happening in Ottawa, nothing quite so dramatic as this has been shown." He pushed another button.

The wall disappeared and Chandler felt he was actually looking across the rooftops of Ottawa, once the capital of Canada. At the edge of the business district loomed a massive wall of gray ice. It

was pushing a ridge of boulders and dirt before it as it bore down on the city.

The scene dissolved to a closer view of the glacier. As Chandler watched, fascinated, the glacier ground the city under like a huge bulldozer. And still it came on and, for a moment, looked as if it might flow right into the conference room.

The lights came up and the wall became whole again. A few delegates swiveled their chairs back to the table; others continued gazing at the wall.

"Now," said the Canadian, "you can see why our plan calls for a dramatic approach."

"Tilting the Earth on its axis is quite out of the question," Dr. White said. "But freezing the Arctic and removing the source of the snow is practical."

"And time-consuming," the Canadian added.

But Chandler wasn't listening. A sudden dizziness swept over him. He felt strangely detached.

"I don't think we're capable of reversing the warm currents flowing into the Arctic," he found himself saying. "The Bering Strait Dam is one thing, but a dam across the North Atlantic . . ."

"Then what have you in mind?" asked the Russian.

"How would you react to a little suggestion of my own?"

Again all eyes were on him. "Suppose we were to tap the heat right from the Earth's core?"

The reaction was dead silence. Finally the Englishman spoke.

"Mr. Chairman, in one breath you suggest the impracticability of damming off the waters of the Atlantic, and in the next you suggest drilling into the depths of the Earth!"

"Surely you are jesting," the Russian added. "Why not tilt the Earth, as the Canadians suggest, if we must lean to the sensational?"

"If I were not acquainted with your reputation, Dr. Chandler," the man from India said, "I would not for a moment entertain such a thought."

"Possibly," said the Englishman, "you mean pockets of magma near the surface."

"I mean the core itself," Chandler insisted.

"Gentlemen," Marta Neilson said. "As you know, I have been working rather closely with Dr. Chandler on the plans that have been suggested. However, tapping the core comes as a surprise even to me. But because I am acquainted not only with his reputation"—she acknowledged the Hindu with a nod—"but with his ability as well, I move that we allow Dr. Chandler to pick a committee to consider the feasibility and

the consequences of such a plan."

"And what sort of magical drill is going to accomplish this?" the Russian demanded.

"The edge of the core is 1,800 miles down—" the Englishman started to say.

Chandler rapped his gavel once. "I believe there is a motion before us," he said.

UNLIKE the days before the threat of avalanches, the tubeway over the Sierra Nevada range was not heavily traveled. Twice in the past year avalanches had dislodged the tube, once resulting in a number of deaths—something that hadn't happened on American highways for nearly fifty years. But it was the most direct route to the Detroit Glacier Control Center.

"I'm not sure you made a wise choice in Kotenko," Marta said. She sat next to Chandler on the rear observation deck, occupying Professor Kotenko's seat while he chose to mingle with the passengers in the main lounge.

"Why?" asked Chandler.

"Well, I'm not much of a politician." She glanced around before continuing. "It'll be another century before Europe forgets World War III. Maybe you thought Kotenko's selection would appease the Eastern Union or maybe you were simply trying to get him out of the role of principal opponent, but—"

"I picked him because I needed him."

Marta frowned slightly. "Now it's my turn to ask why."

"Kotenko isn't just another glaciologist or meteorologist," Chandler said. "His forte is pure science—creative science."

"But he's impractical." Marta sat back in her chair. "You were the first to point out the weaknesses of his greenhouse plan. In fact, you were rather vehement about it before the conference. What happened to change your mind?"

Chandler didn't answer. Instead, he stared disinterestedly at the snowy moonlit peaks distorted by the curvature of the transparent tubeway walls. Marta touched his arm.

"I don't mean to get personal," she said. "But you seem to have changed a great deal quite suddenly. You're colder, as if you had lost your sense of humor somehow."

Chandler met Marta's gaze. "In a way, I suppose I did."

"Paul," she started to say, but Professor Kotenko strode down the aisle and plopped into the seat on the other side of Chandler.

"I'm afraid these were the best cigars they had in the lounge," he said, holding one out for Chandler.

"They'll do," Chandler said.

The two men lit up. Kotenko, through a haze of blue

smoke, started picking at Chandler's brain like a surgeon undertaking an exploratory operation.

"Now then, my dear Dr. Chandler, what will this magic drill be?"

"I was thinking of superdense metals from Pluto and, maybe later, from the depths of the Earth itself."

"You are thinking in terms of conventional drilling?"

"I have been, yes."

Kotenko settled back in his chair, his bull neck against the padded head rest. "I don't wish to insult your intelligence by asking if you have any idea of the pressures at those depths."

Chandler rolled his cigar in his fingers but said nothing.

"The drill cores we've removed from the crust under the Pacific bear out our mathematics on pressures," Kotenko continued. "But heat is something else again. There will be hot pockets, semi-molten strata, finally molten material of great density. We can only guess at the temperatures. Your drill casing must not only stand up against fantastic pressures but also temperatures that will make the toughest alloys run like quicksilver."

"There have been lab experiments removing heat-conductivity entirely from metals," Marta offered.

"What is to keep the pressure from blowing the casing

right out of the molten rock?"
Kotenko asked.

"Pressure traps built into the solid strata wherever we find it," Chandler said.

Kotenko digested this thought for a moment. "Then your drilling must be fully automated and not physically directed from the surface."

"It can be done," countered Chandler.

"And I suppose you will use some sort of thermocouple or heat transfer pump to direct the heat against the ice."

CHANDLER nodded. "And pump it into the air to raise the mean temperature in the glacial areas."

"That will cause some unusual weather aberrations," mused Kotenko.

"Nothing that the weather control boys can't handle."

"Are you sure," said Kotenko, drawing on his cigar, "that the core of the Earth is made of molten metal?"

"I've been working on that assumption."

"There are those who feel it might consist of compacted hydrogen atoms."

"Would it make much difference as long as we can use the heat?" Marta asked.

"If we are not careful in tapping such a core—" Kotenko paused for a moment, considering the consequences—"we could turn the Solar System into a binary system."

"I doubt that," Chandler

said. "Besides, I don't plan to set off an X-bomb in the core."

"The immediate problem," said Kotenko, "is to drill such a hole."

"It will take some real engineering," Chandler admitted.

"It will take more than engineering." Kotenko looked directly into Chandler's eyes. "Will you listen to a suggestion of mine?"

"That's why I singled you out for the committee."

"Forget a drill of superdense metal." He leaned forward. "Use a device that will melt anything it comes into contact with, fuse the material into a casing and remove the heat conductivity from it so that it will remain solid. This device would sink toward the center of the Earth on a gravity drive principle. Your pressure traps would be force fields—controlled to allow surplus debris to spew out the top like an oil gusher." Kotenko settled back against the head rest.

"Where would we get the energy to drive this device?" Chandler asked.

"Thermo-nuclear power developing heat and thermo-electricity."

"Then I would be taking a fusion bomb into the core of the Earth."

"Yes, you would. You would have to maintain careful control from the surface."

"And suppose the core is made of compacted hydrogen atoms?" Marta asked.

Kotenko blew a long ribbon of smoke. "I doubt if there would be any danger unless we add the X-factor to the device."

Marta started to speak, but an insistent electronic chiming interrupted.

"Emergency deceleration," Chandler said calmly.

Even before the "Fasten Your Seatbelts" sign flashed on, Chandler, Kotenko and Marta had the buckles clamped tight and were braced against the head rests of their chairs. Light beam generators whirred. The tubecar shuddered and lurched to a stop. The lights went out and a woman screamed somewhere.

"There is no danger," the reassuring voice of the driver said over the speaker system. "There seems to be some trouble ahead." The lights flickered on dimly.

"We are on our own power," Kotenko said. "The tube must be out up ahead."

"Another avalanche?" asked Marta.

A private car pulled up behind them and cushioned to a stop on their force field bumper. Chandler swiveled his chair around and looked through the front viewdome at the scene ahead. The tubeway was illuminated with faint emergency light panels for about two hundred feet. A

Greyhound Tubecar and several private cars were stalled at that point. Beyond was blackness.

Marta unbuckled her seat belt and stood up to see better. Chandler gazed up the slope of a towering peak alongside them. Deep snow glistened in the soft reflected light of the tube.

"We have just received word of an avalanche," the voice of the driver reported. "There is no immediate danger. However, we may be forced to turn back to—" A sound as of rolling thunder drowned him out.

"What—" Kotenko started to say, and then a gigantic mass of snow shuddered down the side of the mountain and broke against the tube like a foaming tidal wave engulfing the shore. Marta screamed and fell into Chandler's arms as the tubeway lifted, twisted, then slid with the snow into the valley below.

IT WAS like the dissolve on the video screen. Marta's terror-filled eyes were replaced by the penetrating eyes of the short man in the gleaming laboratory.

"Clench your fingers."

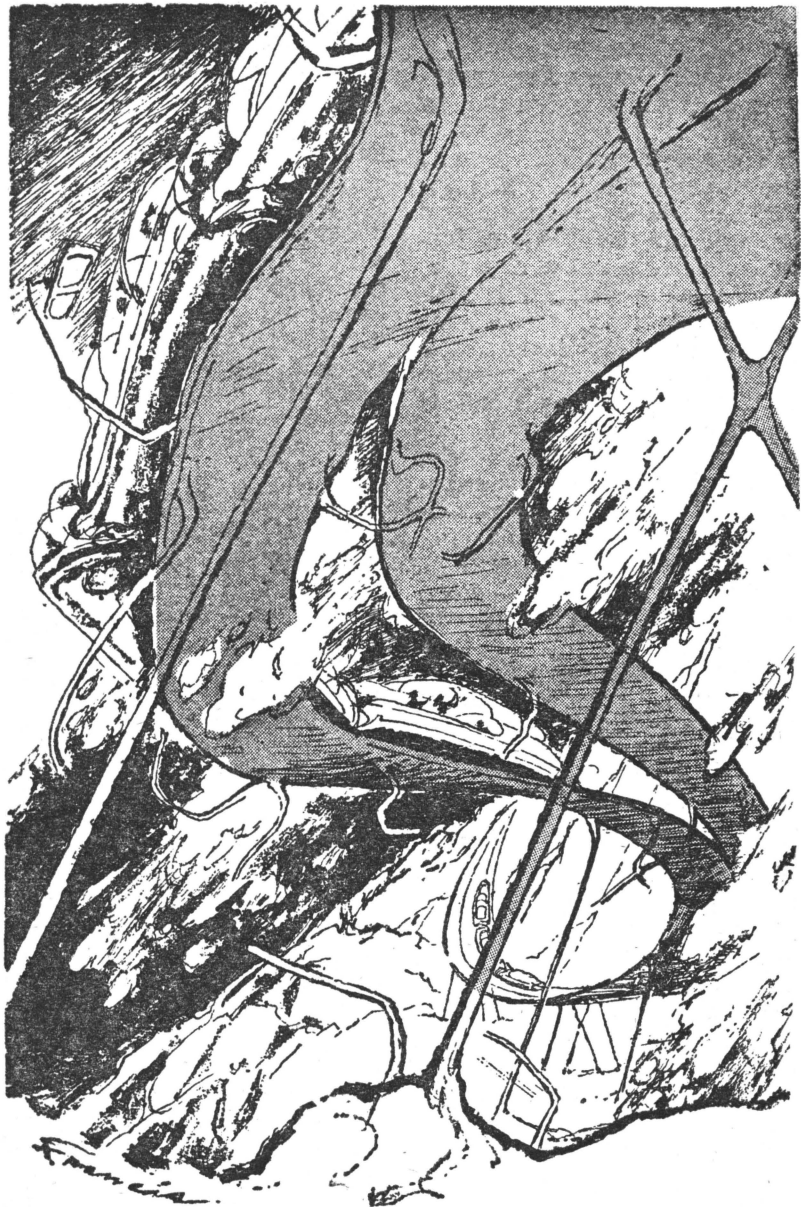
Paul did.

"Blink your eyes."

Paul did that, too.

The tall man turned from the control panel and looked down at Chandler.

"That was close," he said.



"Everything could have been lost in that one moment."

"Marta," Chandler murmured. "What happened to Marta?"

The short man looked up at the taller one. "Let's skip-time him three or four hours to avoid the possibility of losing him in the avalanche."

"If that doesn't work," the tall man returned, "we'll have to go all the way back to the conference and start again."

"I don't know what this is all about," Chandler said.

"How could you?" said the tall man. "Under your present programming, all memories have been canceled out."

"What is my purpose?"

"You know that." The tall man fingered a series of switches.

"Think we'll have to clear him?" Chandler heard the short man ask.

"No, I think we're just under the critical level."

The short man leaned over Chandler and watched closely. There was another dissolve. The man's eyes were replaced by Professor Kotenko's, sparkling with alertness.

"You fainted," Kotenko said. "Like a woman, you closed your eyes and fainted."

"What about Marta?" Chandler asked.

Kotenko smiled. "She didn't faint."

"Then she's all right?"

"Everyone in the last three cars lived—a few broken

bones, that's all. The tube separated and the front cars and some of the other vehicles were carried down into the valley. This would not be permitted in the Soviet Union."

Chandler sat up. He was on the floor of a gymnasium. A brightly painted poster on the wall extolled the virtues of the Reno Union High School basketball team. Perhaps thirty others were on the floor covered with blankets and tended by doctors and nurses.

"We were brought in by verti-plane," Kotenko explained.

"How long has it been?" Chandler asked.

"Three or four hours. A long time to be unconscious. They want to X-ray that skull of yours."

CHANDLER frowned. "No need of that."

Again Kotenko smiled. "That's what I told them, but medical men sometimes get carried away with their importance in these emergencies."

Chandler tossed the blanket from his legs and stood up. "I feel fine," he said.

He led Kotenko down a makeshift aisle between the rows of injured. At the front entrance, he was intercepted by Marta.

"Where do you think you're going?" she demanded.

"To the center."

"But—"

"No arguments. We've got a lot of work to do."

"You make it sound as though there's no time," she said.

"There's much less than most people think."

"What do you mean by that?" asked Kotenko.

Chandler hesitated. There was something filed away in the back of his mind, but he knew he'd have difficulty explaining how he knew what he knew.

"You saw the video tapes of Ottawa," he said. "Montreal will be next, then Toronto, Chicago, Buffalo, Detroit, Toledo and, at the same time, Norway, Sweden, Ireland and eventually all of northeastern Europe."

"Ah," the Russian grinned. "Excellent strategy. Set a deadline. Let everyone know you are working against time and you'll have much less opposition and much stronger backing."

"What sort of a deadline?" Marta asked Chandler.

"A month to test the feasibility, then one year to develop the drill."

"I can hardly wait to see the faces of the committee when we tell them that," said Kotenko.

BUT Kotenko showed little interest in the surprised faces of the committee when Chandler announced his deadline one month later in De-

troit. Chandler knew that it was another aspect of his report that deeply concerned the Russian.

Marta supported Chandler's contention that the job could be done—and in a year. She produced carefully detailed studies of non-conductive metals that she had painstakingly prepared.

Finally it was Kotenko's turn.

"Yes, Dr. Chandler, with his rather remarkable mental resources, has clearly shown that the drill can be produced by modern technology. And I believe that Dr. Neilson—he smiled at Marta—"can lead the way to a system of non-conductive conduits to pump the heat anywhere it is needed. Only the one hole with its inexhaustible supply of heat will be necessary. On only one point do I disagree with Dr. Chandler."

Paul Chandler was doodling unconcernedly on the edge of his notepad.

"And that," continued Kotenko, "is on the need for the X-factor."

Dr. White demanded the floor and Chandler acknowledged him without looking up from his notepad.

"For years," the Englishman said, "the Russian government has steadfastly refused to agree to the use of the X-factor. I can appreciate their feeling, since it was the X-factor that tipped the

scales in favor of the West during World War III."

"Tipped the scales?" Kottenko said. "I was a very young boy, but the sight of the vaporized cities of Russia is burned into my memory."

"I believe I have the floor." Dr. White looked from one face to another as he addressed his remarks to each delegate seated at the conference table. "If we had been free to use the X-factor, we could now have reached the stars with no need to concern ourselves with the time barrier. Instead we are virtually confined to the barren planets of the Solar System. Right here on our own planet, the X-factor could have rebuilt the world almost overnight following the war."

"There is an ancient saying," Kottenko interrupted. "Those who play with fire—"

"The time has come," Dr. White pushed on, "to reappraise our position with regard to the X-factor capsules lying unused in the Swiss stockpile."

"We are hardly in a position to act on that matter," said the delegate from Greater Germany. "This is a matter for the Council itself."

Chandler tossed his pencil aside and stood up. "Nor is there any need to get a decision at this moment. The drill—with or without the capsule—will be basically the same. I'd like to see a motion for

work to proceed on the drill. The matter of the X-factor can be decided later."

"I make such a motion," said the Canadian.

The motion was passed.

It was Marta who selected the site. She chose a grassy meadow in northern Michigan that stood directly in the path of the advancing glacier. But long before the first fingers of the glacier could search out the site, searing billows of heat would spread like a spider web across the mountain heights and northern reaches of North America, the north Atlantic and northwestern Europe.

Only Marta's stubborn insistence that this was the most central location had worn down a number of European delegates who had wanted operations to begin on their side of the Atlantic.

Kottenko, with a green light from Chandler, ordered three long-abandoned automotive plants into action in Michigan. Scientists and technicians from many nations of the World Council were brought together in the old General Motors Technical Center in Detroit. Plans were drawn, models constructed and a test vehicle sent to the center of Saturn's moon, Mimas.

CHANDLER carefully studied Kottenko's report of the Mimas probe, then met

with the Russian in the latter's office.

"I know why you're here," said Kotenko, offering Chandler a black Russian cigar. "You must take into consideration that this was only a scale model."

"But it had full power," Chandler argued.

"The initial descent was held to fifty miles an hour." Kotenko lit Chandler's cigar. "A fast start and we would have done it with power to spare. And remember that we haven't licked the heat problem. The test drill was softened by friction heat."

"You still couldn't have made it to the center of Rhea, let alone to the core of the Earth," Chandler said.

"It can be done," Kotenko insisted, "and without resorting to your X-factor."

"I've requested a special meeting of the World Council together with the committee to clear the way for using the X-factor."

"I'll oppose it. Since I am in full charge of constructing the drill, my words will bear some weight."

"I doubt if you will object," Chandler said. "I've just received a report from the State Department. They have good reason to believe that your government will back the release of one capsule."

Kotenko stared at Chandler. Finally he rotated his cigar in his fingers and stud-

ied the burning end. "Then I'll resign."

"No, you won't. Your government wouldn't permit it." He smiled at the Russian. "And neither would I. You're too valuable a man."

Kotenko was still studying his cigar as Chandler left.

THE X-factor capsule arrived under an international guard with the blessings of slightly over half of the member nations. Kotenko didn't resign, but his friendliness vanished.

That same day, Marta broke in on Chandler and, to the consternation of his secretary, hugged him.

"We've done it!" she cried.

"Here, here, take it easy." He held her at arm's length. "All right, what have we done?"

"Remember the things you said to me about slowing down the molecular activity of metals?"

Chandler nodded.

"Well," she continued, "we've just had a major breakthrough in the metallurgical lab, once you showed us the way. We can practically remove all of the heat conductivity. In less than a month we can start manufacture of the conduits."

Chandler smiled. The last obstacle was over.

"And more than that," Marta said, "we can build a test drill that will go down

into one of the big moons—one with a molten core.”

“The next drill,” said Chandler, “will be the *real* thing to tap the core of the Earth.”

Marta kissed him.

The drill took less than the projected year to build. On the grassy Michigan meadow, as several hundred dignitaries, reporters and curious spectators in wind-whipped overcoats were held in check by armed troops, the giant device was lowered toward a concrete basin. Sizzling arc lights mounted on the control ring, a circular concrete building surrounding the basin, illuminated the scene against the growing darkness of night.

The Soviet press was lauding the drill as a Russian achievement. Most Western papers gave the credit to Dr. Paul Chandler. But Chandler knew it was Kotenko's idea, made possible by his own mental resources, surprising even to himself.

Chandler felt a deep pride as he gazed at the drill, complete with the controversial capsule.

“**E**XCUSE me, Dr. Chandler.” A reporter with dry, unkempt hair stepped up. “I still don't see how that thing will work.”

“In simple words, the rock is drawn into the bottom something like air into a jet engine,” said Chandler. “The

rock is vaporized and expelled out the top where the vapor together with the device itself presses the molten material into the walls of the shaft. Because the rock has had its heat conductivity removed, it hardens and remains permanently solid. A tubular force field keeps the shaft from collapsing.”

“I understand that much.” The reporter took out a folded square of paper and a pencil. “But what makes the thing go?”

“It has a gravity drive, giving it many times its normal weight.” Marta Neilson had moved up to Chandler's elbow. “It simply sinks toward the center of the Earth like a pebble sinking in a pond of water.”

“What is your reaction to Senator Caldwell's remark that the administration is at last returning all of the nation's gold into a hole in the ground?”

Chandler laughed. “Don't get me mixed up in politics.”

“Are you disturbed by the Interplanetary Council of Churches' charge that any attempt to stop the glacier is defying the will of God?”

“Nor religion, either, please.”

“Then maybe you'll discuss your own field,” the reporter said. “Are you aware of the petition signed by thousands of African and Middle Eastern scientists?”

"I've read about it," Chandler admitted.

"Do you feel that taking an X-bomb into the center of the Earth is completely safe?"

"Nothing is completely safe." Chandler pointed to the reporter's feet. "The ground may give way under your feet right now, but I'd bet my life that it won't."

The reporter studied the ground under his feet, then scribbled a few words on his paper. A moment later, he spotted Kotenko and excused himself.

Marta gave Paul's hand a firm squeeze and he squeezed back. Dr. White stepped up and offered his congratulations, adding the suggestion that perhaps now they should turn their attention to destroying the Bering Strait Dam. Chandler parried the question and the Englishman left to exchange pleasantries with the Indian delegate, who was engaged in an animated conversation with several committee members.

"Well," said Marta, smiling up at Chandler, "tomorrow's the big day."

"Worries me," Chandler said.

"You mean the composition of the core?"

Chandler nodded at the drill. "Basically, that thing is an X-bomb. If fusion were to occur in the core and that core *were* made up of compacted hydrogen atoms, I

think the Earth might crack apart along the fault lines surrounding the Pacific Ocean basin."

"What could cause fusion?" Marta asked.

"Losing control from the surface."

"How do you mean?"

"Well, it'll tax the abilities of the controllers every minute," Chandler explained, "to compensate for variations in density and gravity. If that thing got away from them, even for a few moments, its velocity could build to a point where it would hit the center of the Earth's gravity at the speed of a meteor."

Marta's eyes opened wide. "And, of course, it would stop almost instantaneously."

"Most of the energy of its forward motion would be converted to heat, which would develop a temperature far more than enough to trigger the thing," Chandler said.

"But it's made of non-conductive alloys," Marta said.

"Which would only make it happen quicker by reflecting the heat back in on itself."

THE press photographers' strobe lights began to flicker as the drill was lowered into the center of the control ring. Someone was making a speech, thin sounds wavering across the meadow, as Chandler and Marta started walking toward the VIP geodesic dome, where most of

the top scientists were quartered.

Marta stared at Chandler for a moment. "Why didn't you say something about this to me, Paul? Now I know why Kotenko favored hydrogen fusion without the X-factor."

"It wouldn't have done the job," Chandler said. "Just not enough controllable power."

"Kotenko thought so."

"He was wrong."

"Then why did you insist upon the drill? Surely some of the other methods were workable. What about India's suggestion to set off a number of H-bombs underground to produce pockets of magma? That would have produced plenty of tappable heat."

"I don't know," was Chandler's honest answer. "Call it a hunch or a premonition, but I think it's the drill or nothing. Once the core is tapped, the danger is over; we won't have to drill any more holes. We'll have an unending source of heat, and non-conductive conduits to pump it anywhere on Earth."

"Paul," Marta said, "I've always gone along with you on just about everything. Maybe the fact that I'm a woman has been outweighing the fact that I'm also a scientist. But let's talk now about the moral obligation of a scientist."

"I'm interested in one thing—the best method to

save civilization from certain destruction."

"But have you the right to gamble like this? Which is worse, the destruction of civilization or the destruction of the Earth?"

"Marta," he said, "man at last stands at the brink of fulfilling his destiny. He is already establishing colonies on two planets and within a hundred years will have a firm foothold in the Solar System. In the millennia that follow, the Galaxy will be his."

Marta stopped in horror. "That sounds like Colonial talk!"

Chandler smiled reassuringly. "In this case, what's best for the Colonies is also best for the Mother Planet."

"But surely there's time to halt operations long enough to try some of the other methods first."

"If we were to falter now," said Chandler as they began walking again, "politicians would have most of us replaced inside of twenty-four hours. Would you like to see that drill start its plunge to the core without someone on hand who knows how to handle it?"

"No, I wouldn't," Marta said. "I'm not sure I want to see it start at all." She touched his arm. "Paul, this is a side of you I've tried hard not to see. You're—you're almost obsessed with the belief that the drill is the only answer.

And you're battling ruthlessly against counter-ideas and time. After all, even the most radical estimates give us at least two more centuries. Granted there'll be a southern migration, but—"

"Don't ask me how I know," Chandler said, "but we don't have two or even one century. *We don't have ten years!* When the ice cap at the South Pole was at its peak, it exerted tremendous pressures on the continental land masses."

"The old shifting crust theory?"

"Yes. A theory tossed into discard when the big thaw came at the South Pole. Now, at an almost unbelievable rate, the ice is building in the north. This same seesawing effect has gone on throughout the Pleistocene. The stresses go one way against the crustal blocks of land, then the other way. It might be likened to bending a wire one way, then the other, until fatigue causes it to snap."

"And you're convinced that the crust is about to let go?"

"With catastrophic consequences."

"You're asking me to accept a great deal on faith."

"When you stood by me back in New San Francisco," Chandler asked, "did you honestly think we could tap the core?"

"I don't know," Marta answered.

"Would you have supported me if I had backed the Canadian plan for tilting the world on its axis?"

MARTA seemed lost in deep reflection for a few moments. "I don't really know," she said as they reached the VIP quarters.

At Marta's door, Chandler asked, "Will you stand by me for another twenty-four hours? By that time, the drill will be cushioning to a stop exactly two thousand miles down."

"Unless we lose control," Marta said. "Then, in less than an hour, it could be smashing into the center of the core."

"Will you wait?"

For an answer she kissed him on the cheek, then said softly, "Now we better both get some rest. We start operations in less than six hours." She closed her door.

Chandler entered his room and stretched out on his cot without taking his clothes off. He thought about the plans he had ignored. Some of them might have done the job. He thought of Kotenko, who distrusted him, and Marta, who trusted him. Finally he drifted into sleep.

He dreamed of great cracks snaking their way down city streets, of violent earthquakes, foaming tidal waves, of people trapped in crumbling buildings and, finally,

the Earth blooming into another sun.

And as the fireball expanded into oblivion, the shimmering face of the short man appeared. His mouth moved, but Paul sensed rather than heard his words.

"Chandler. Kotenko and the drill."

The face faded to nothing.

Chandler sat bolt upright on the cot. He was dripping with perspiration. The drill! Something was wrong at the drill.

He ran down the hall to Marta's room and rapped on the door.

"Who is it?" Marta's voice called out.

"Paul."

There was a pause. Then the door opened, revealing Marta fastening a negligee.

"Did I oversleep?" she asked, yawning.

"Have you seen Kotenko?"

"No, but I heard him talking to someone in the hall just after you left. It sounded like that reporter."

"Did Kotenko go into his room?"

"I don't know."

Chandler, followed by Marta, continued down the hall to Kotenko's room. He knocked loudly. There was no answer. He knocked again and shouted Kotenko's name. Other doors opened and people stared out.

"The drill," Chandler said, and ran out of the building.

As the door swung closed, he heard Marta calling after him. He was conscious of someone pushing through the door behind him as he bounded across the meadow toward the drill.

A small Army verti-plane swung down alongside him.

"Halt!" an amplified voice boomed.

Chandler stopped and faced the plane. "It's me, Dr. Chandler."

The plane settled down beside him. "Oh, yes, sir," the voice apologized. "We saw you running and—"

"Quick, take me to the drill," Chandler said.

"Yes, sir," said the voice.

The verti-plane floated down beside the massive control ring and Chandler, followed by two armed soldiers, raced through the main doors.

"Halt."

Guards surrounded them.

"Has Kotenko been here?" asked Chandler.

"Yes, sir," replied one of the guards recognizing Chandler. "He took a team of technicians to the Gismo."

"Follow me," Chandler ordered, and pushed through the inner door.

Hesitantly, the guards followed.

DOWN in the basin, Chandler saw the yellow glow of a work light. Figures were silhouetted against it. He took the spiral stairs two at a time.

The soldiers clambered down behind him.

"Stay where you are, Chandler," said the voice of Kotenko, his stocky figure back-lighted at the base of the drill.

"What're you doing, Kotenko?" Chandler demanded.

"Removing the X-factor capsule."

"You're tampering with government property," Chandler said, primarily to orientate the confused guards.

"I am not going to permit the drill to go down there with the X-factor," Kotenko said firmly.

"It'll never get beyond the thousand-mile level," Chandler warned, moving toward the shadowy figure.

"I am armed," Kotenko warned.

CHANDLER stopped. Marta, clad in an overcoat, came down the stairs. Several others followed.

"Those techs will never do it now that they know the situation," Chandler said, moving still closer.

"My dear Dr. Chandler, they are citizens of the Soviet. They will do as I say."

"Put down your gun," the soldier at Chandler's side ordered.

"I have already set up the drill for descent," Kotenko said. His shadow hand touched a black lever on a portable field control unit. "As soon as

the X-factor capsule is withdrawn, down it goes."

"But you can never maintain control without a full crew," Marta said.

"I have crew enough," Kotenko told her. "Without the X-factor, complete control is not so important."

Chandler leaped for Kotenko, but the Russian's gun blasted white flame. A searing pain ripped into Chandler's chest. He fell to his knees.

The soldier's rifle cracked and Kotenko's silhouette crumbled against the control lever. Electro-mechanisms whirred and the drill suddenly plunged into the depths of the Earth, carrying most of Kotenko's crew with it.

"Good God!" someone cried.

Marta was kneeling beside Chandler, tears streaming down her face. "Paul!" she sobbed. "Oh, Paul!"

Chandler could taste the warm saltiness of blood in his mouth. "Get the control crew here—quick," he gasped.

Someone moved for the stairs while someone else leaped for the field control unit.

Chandler's foggy mind touched reality for brief moments, condensing time into a montage. A doctor was working on him, then shaking his head at the sobbing Marta. Lights were thrown on and control posts manned. Someone yelled, "Throw in force

fields behind it!" And all the time Chandler's chest pulsed with pain.

"Can't stop it!" someone shouted. Then chaos broke loose; men were running, blindly bumping into one another.

Even though few of them knew quite what could happen, they wanted to get as far away from the hole as they could.

Marta was rocking Paul gently in her arms and crooning something Swedish. The ground trembled under them, then lurched violently. Sheets of broken plate glass rained down on them from the control ring windows. Chandler knew the same thing was happening everywhere as the shock waves from the drill reverberated around the globe.

He looked around. They were alone on the basin floor except for the contorted body of Kotenko. Paul looked up at Marta.

"How—much—time?"

Marta, her face close to his, smiled faintly. "No more time for you and me." Her eyes were dry.

A sound as of millions of giant rocks grating together welled up from the bowels of the Earth. He was looking into Marta's eyes when suddenly everything vaporized into blinding white heat.

"Clench your fingers."

"Blink your eyes."

THE short man in the gleaming laboratory was leaning over Chandler. "We did our best," he said.

The pain was gone in Chandler's chest. "Marta," he called.

"I'm afraid she's gone," the tall man said. "She and the entire Earth."

The short man pulled off his lab coat. "Over a thousand years ago."

"A thousand years?" Chandler's mind fumbled with the thought. "What's this all about?"

The tall man snapped a series of switches off. "You ask the same question every time."

"Every time?"

"We've sent you back three times now." The tall man traded his lab coat for a tunic. "Once you tried to X-bomb the Bering Strait Dam, but the crust shifted, wiping out the whole population. On the second time pass, you tried to tilt the Earth on its axis, but it was thrown out of orbit and plunged into the sun. This time—you still have your memories of that."

"Makes you wonder about fate," the short man said.

"But what am I?" Chandler sat up with an effort.

"You," explained the short man, "are a mind developed here in a Venus laboratory and sustained in a host body. You see, we can't send solid matter back in time, only

waves moving at the speed of light. So we send your mind matrix to meld with Chandler's."

"But why?"

"To help him save the Earth," the tall man said. "When it was destroyed originally, small colonies of us were stranded on inhospitable planets. We're still trying to crawl out of the decline that set in. But if we can send you back and save the Earth—well, you will remain with Paul Chandler. And we—?" He walked to a bank of controls near the door and put his hand on one. "Who knows? None of this will have happened. We might not even exist."

"Now," said the short man, joining the taller one, "we will have to wipe out all memories for you and tomorrow we will start programming you for another try. Maybe this time we'll try moving the Earth's orbit closer to the sun."

"Wipe out my memories?"

"Of course. We want you to function with a clear mind. Besides, it's kinder to you."

"I see." The mind named Chandler looked at the two men. "But please leave me with my memories just for tonight."

The tall man turned off the light. "You always ask that and we always do."

END

"I NEVER CARRY MONEY!"

Any extrapolations on the future must take into account the financial revolutions in the past and present. Checks (or cheques, to give their originators their due) eliminated the flow of great amounts of cash. Credit cards of all sorts have brought the process down from industry and business and household to all but practically the pay telephone—and science fiction writers have extended the system even to that, with fingerprint and retinal identification, to remove the possibility of fraud and incorrect billing.

But less noticed is the immense job done by B. T. Babbitt, who, in 1851, stopped selling soap by weight from slabs, and wrapped a lithograph in each package, thus making two important innovations. In not much over a century, packaging has become an incalculable huge industry—and premiums give away or sell at less than cost more than one billion dollars' worth of merchandize a year!

Thirty per cent of all china ware, 15% of all enamel ware and 10% of all aluminum ware manufactured in the U. S. are sold or given away annually as premiums, and the figures are rising steadily!

Let's hope it never happens again, but cigar-store coupons and scrip were used as legal tender in many towns during the depression.

It seems like humor right now, but the time actually may come when cash will become a museum oddity!

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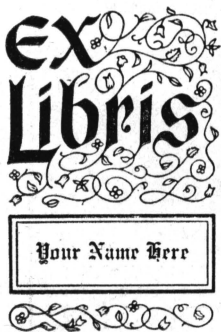
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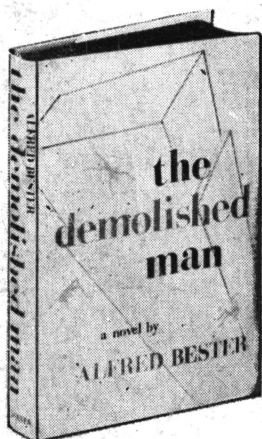
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