



**The**  
**SQUARE**  
**CUBE**  
**LAW**

*The disappearance of three million dollars from the sealed rocket ship was a man-sized problem. But the answer was bigger than that!*

**A Novelet by  
FLETCHER  
PRATT**



**I**

**G**EORGE HELMFLEET JONES said, "I've been wanting to meet you, sir, I suppose that in a certain sense you're my father-in-law. But you can understand how Angela—that is, Mrs. Jones—would feel a little nervous about coming back here."

He looked across the desk toward Dr. Runciman, head of the Braunholzer Re-

search Institute, then across at his schoolmate, Richard Mansfeld, and finally tried a tentative smile in the direction of Dr. Betty Marie Taliaferro, the gorgeous blonde scientist who looked enough like his wife to be her twin sister. There was every reason why she should; Betty Marie Taliaferro was the mould, the original, from which Angela

Jones had been born as a living duplicate, in the Runciman reproducer.

She didn't smile back, and neither did Runciman. Instead, the scientist said, "Yes. Yes. It would have been a pleasure. I understood your call was official, Mr. Jones." The smooth face within its frame of white hair looked a rebuke over the idea of allowing social amenities to break in on a busy working day.

Dick Mansfeld chuckled and said, "George, you want to remember that your status around here is just that of another government man. Since you were here two and a half years ago and found out about the reproducer, they've been showing up around the place, and every time one of them does it means more trouble. Isn't that right, Doctor?"

Runciman's face relaxed just enough to recognize the fact that his assistant for chemistry was on friendly terms with this intruder. "I fear so; I fear so," he said. "Nearly every department of the government wants us to reproduce something absolutely essential and at once. I really do not understand why they cannot consent to the construction of another reproducer unit. Besides which, my assistants and myself are subjected to a most annoying personal surveillance under the name of protection."

"It's slightly political," explained Jones. "Can you imagine what the economic effects of having any number of these reproducers in action would be? Neither can anybody else, and they don't dare take the chance. There's also the question of foreign countries. As long as there's only one reproducer and only you three people to watch, the government can be reasonably sure that the secret remains in this country. Remember what happened after the Russians got the formula for the atomic bomb?"

"I suppose so. I suppose so," said the doctor. Jones observed he liked to repeat himself, and Betty Marie stirred in her chair.

"All right," said Jones, "I'll explain

why I'm here. I'm in the Secret Service."

"I have been informed of that," said Runciman, still a trifle frosty.

"Well, we've had a crime—by we, I mean the government. It isn't a crime the secret service would normally deal with, but there seems to be a linkage here, and as I worked here before on the Benson case, they decided to call this one a prima facie case of counterfeiting and assign me to it."

The three faces before him expressed varying degrees of indignation. "But we haven't been counterfeiting anything!" cried Betty Marie, beating the others to the punch.

"I didn't say you had, and I don't think you have," said Jones. "I'm perfectly well aware that everything that goes into the reproducer is checked and registered down to the last milligram of raw materials. All the same, an inexplicable loss was reported from here—"

"But that was a year and a half ago!" said Betty Marie.

"—and it hasn't been cleared up," Jones went on, with iron persistence. "Now there has been another disappearance which nobody has been able to solve, and when the data were fed into an integrator, it came up with the suggestion that there might be a connection with your disappearance here. Gave it an eighteen per cent possibility. That's enough to work on, so here I am, seeing if I can get any angles from what happened in your case."

Dick Mansfeld said, "Can you tell us about this new case?"

"Don't see why not," said Jones, agreeably. "You're all highly classified, and you might be able to see some point that missed the others and the integrator, too. Well, it was the robbery of three million dollars."

**MANSFIELD** whistled. "That's a lot of dollars," he said. "How did it happen?"

"This way. You know, the flow of business is such that occasionally one

bank district will accumulate more cash than it needs, while another one will run short. When that happens the Federal Reserve Bank in the district where there's an overage will make a cash shipment to the district that needs it. Well, about six weeks ago, on June sixth, to be exact, the New York Bank decided to send the three million to San Francisco. It never got there."

as good as mine. The thing was simply impossible. The money, mostly in large bills, was packed in an orlon bag by one of the cashiers of the New York Bank in the presence of one of the governors. That's required by regulation, and though I haven't checked on it yet, I'm sure there must have been two or three other people standing around. The bag was then sprayed with Brockenit.

## *The Bigger They Are*

**A** GRASSHOPPER can jump a hundred times its own length; a man barely four times his. An ant can walk off with a load twenty times its own weight while a strong man can lift about twice his and a horse or an elephant considerably less than their own weights. And the big old dinosaurs could hardly stagger along under the crushing load of their own muscle.

The trouble lies in the square cube law, which states that if you square your size you cube your weight. Translated, if you are twice as big you are not merely twice as heavy, but *eight* times as heavy. Which means you've got to have eight times as much muscle to move you, which adds to your weight—and so starts a vicious cycle which is the main reason the dinosaurs died out. They couldn't move.

The same principle applies in power mechanics. If you double the weight *or the speed* of your car, you need eight times as much horsepower to shove it.

The square cube law sometimes gives engineers gray hair, but it has given our Fletcher Pratt the springboard nudge for a very different kind of story. Also, it's a sequel to **DOUBLE JEOPARDY**, which you read in the April issue.

—The Editor

"I didn't see anything about it in the papers," said Mansfeld.

"There wasn't anything," said Jones. "They hushed it up, and I'm going to ask you to keep quiet about it, too—at least until they find out how it was done. That's what is worrying the big boys in Washington—not the loss of the three million, but the fact that they can't figure out a method, and they don't want to broadcast the fact. If the criminal knows that he's apt to try his little stunt again."

Dr. Runciman said, "What is your conception of how this bizarre disappearance was accomplished?"

Jones made a gesture. "Your guess is

In case you don't know what that is, it's a chemical which is invisible, but which comes off on the hands, thanks to warmth and perspiration. Even then it isn't visible, except in ultraviolet light."

Betty Marie frowned and said, "How about somebody using gloves?"

"No good," said Jones. "The heat of the hands would still bring the Brockenit off and it would go right through the gloves. . . Well, as I said, the bag was sprayed. Then it was taken to New York rocket-port by the same cashier who packed it, accompanied by the same governor and a couple of guards. The cashier personally packed it aboard the express rocket for San Francisco, to

avoid letting anyone else get Brockenit on them. The rocket was closed up and left for San Francisco immediately, while the two of them were standing there. When it arrived, it was met by similar officials of the San Francisco Bank. The money-bag was supposed to be the first thing unloaded. It was empty."

The other three looked at him for a second. Then Dick Mansfeld said, "Ah. Did this rocket arrive on time?"

"On the dot. And the money wasn't lifted in San Francisco, either. As soon as the people there saw the money was gone, they held up the rest of the unloading, sent for an ultraviolet projector, and rayed everything in the neighborhood, including the interior of the rocket and the workmen as they unloaded the rest of the cargo. Not a trace of Brockenit."

Betty Marie shook her shoulders slightly and said, "It seems to me that some checking up on the crew of the rocket would be the logical step."

Jones smiled. "You people up here in Geneva should keep up with the rest of the world. I said the *express* rocket. It doesn't have any pilot; it's controlled by radio. Moreover, if it had a pilot, he'd be thoroughly dead by time he got there. The express rocket takes off at an acceleration of 8g, and comes in on a deceleration of the same. The most any human being has been able to stand is a little over 4g, except on the moon run, where they can take 6g in some of those special pressurized harnesses. But not 8; nobody ever took that."

Dick said, "There wouldn't be any possibility of substituting another rocket—"

"Now you're just making wild guesses. It was the same rocket, all right. Numbers and everything. Besides, the rest of the cargo wasn't disturbed."

**D**R. RUNCIMAN cleared his throat. "Are you suggesting the possibility that the reproducer might have been

used to duplicate both rocket and cargo?"

"Not at all, sir. The only suggestion was from the integrator. It has a memory-bank, you know; that's one of the reasons it's useful in a case like this. As soon as the data on the three million robbery were fed into it, it came back with your case here. And now I'd like to have you tell me about that, if you will, and take it for the record." He reached down for the recording box he had brought along. "Sometimes when you repeat a thing, some detail emerges which you unconsciously overlooked the first time."

Dr. Runciman sighed. "I've been over this so often, so often," he said. "Very well, I'll begin at the beginning. A little over a year and a half ago, the Astronomical Institute asked us to undertake a very special project: One of the very best men they have out at Mt. Wilson is Dr. Claude Draper. He was, and still is, engaged on some research into the problem of the cepheid variables. It is extremely arduous work, and because the stars are variables, changing from day to day, it requires constant attention. Dr. Draper is not particularly strong—there's nothing wrong with him, you understand, nothing at all, but his nervous constitution is unable to support the strain of the attention required. So Mt. Wilson applied for, and eventually received from the Bureau of Medicine, permission to have us duplicate Dr. Draper here, in the same manner that Miss Taliaferro was duplicated by—er—your wife."

Jones cut in, "Was this the first human duplicate you have made?"

"The first we attempted since that time, yes. The Bureau decided that the procedure was too dangerous generally to be allowed. Only the fact that Dr. Draper was a very distinguished scientist and that the duplicate could relieve him on a very important project induced them to permit it in this case. Very well. Dr. Mansfeld prepared the necessary chemicals. During the night

before the duplication was to be undertaken, they disappeared from the reproducer room."

"Without any indication of what happened to them?" asked Jones.

"With some slight indication," said Runciman. "The power and radioactivity meters showed a consumption that would just about account for the reproduction of a human being."

Jones rubbed his chin. "Then you deduce that someone got in that night and made off with your chemicals by reproducing a human being, is that it?" said Jones.

"I fear so, I fear so," said Runciman, and Mansfeld added, "That isn't all, George. You know that when Angela was reproduced, she didn't have any moral sense at all. She thought it was quite all right to steal the design of the reproducer because Benson got hold of her before we could, and told her so."

Jones grinned. "I think she's changed," he said.

"Not by being married to you, you old seacock," said Mansfeld, and grinned, too. "But anyway, the point is that somebody has reproduced somebody else in a version with whatever ideas they chose to give the new edition—and it probably isn't good, because it was a sneak job in the first place. When the Bureau heard about it, they took a dim view."

"It was most unfortunate," said Runciman. "They even went to the length of prohibiting further experiments in human duplication, even in the case of Dr. Draper. Most unfortunate."

"In other words, George, you drew the only human duplicate there's likely to be," said Mansfeld. He looked at Betty Marie. "Now if I could only persuade the original—"

"Let's not talk about that," she said.

"All right," said Jones, "then the material that was to make the duplicate—Dr. Draper mysteriously disappeared in the night, and you think it may have been used for a duplication. How did it happen? Don't you have this place

guarded at night?"

"We certainly do," said Runciman. "You've seen the fence and the gate. Since the Bureau appointed itself our guardian, it strengthened the measures we had already put in force. The fence is strongly electrified, and to enter the gate it is not only required that you insert a metal identification ticket in the slot, but also that the entrant submit to the inspection of a spy-ray. The portraits of those authorized to enter are on file in the device, and even if an unauthorized person had the correct identification, he would be rejected by the spy-ray."

"I know about spy-rays," said Jones. "There are ways of beating them."

"Really? I would not have supposed it. However, that is unimportant. After the spy-ray system was installed, it seemed rather pointless to keep a watchman up all night, so an alarm system was rigged to awaken him and at the same time to notify the police if anyone attempted to enter, either through the gate or by way of the fence. On the night in question, he was not awakened."

"No sign of the alarm being tampered with?"

"None whatever," said Runciman. "The authorities, among them several F.B.I. men, went into that exhaustively. They also investigated the guard."

"I see," said Jones. "It just couldn't have happened, but it did. I suppose somebody looked into the possibility of a helicopter landing in the grounds?"

"Oh, yes. Yes. Part of the alarm system is a network of infra-red beams criss-crossing the whole area from those towers in the fence."

"It's sometimes possible to beat them, too," said Jones.

Dr. Runciman smiled. "I am familiar with that. In fact, it is in my field. You can 'beat' infra-red beams, as you describe it, only by giving them too much to do; that is, breaking them at so many points that they cannot identify the essential interruption. In this case, there

was no interruption at all."

"Once more it couldn't have happened," said Jones, "but I begin to see why the integrator turned up the possibility of a connection between your case and the one I'm working on. Both times something disappeared out of a place nobody could get into. Is that the works?"

Runciman nodded, and so did the other two when Jones looked at them in turn. He snapped off the recorder. "All right, then," he said. "I think I'll take a look at the gate first. It seems to me that that offers the best possibilities. Want to come along with me, Dick, and go through the motions of getting in so I can see how it works?"

## II

AS THEY strolled down the walk to the gate, Mansfeld said, "What makes you so certain that this is it? The fellows we had here at the time all thought it was an inside job."

Jones shrugged. "Logic. They give us courses in it at the training school these days. The personnel at your institute hasn't changed, and you've lost something as a result of the incident—that is, permission to reproduce another human. Therefore I have to assume as working hypothesis that you didn't want it to happen and gained nothing from it. When we run into one of these cases, we always look for the man who quits the job."

Mansfeld punched buttons in an irregular rhythm, and the gate swung open. "Yes, but the gate?"

"Logic again. Have to reduce things to their essential elements. Subject to checking, the guards you've got set on this place with the wires and infra-red, make up an unbroken continuity. Therefore your chemical batch, whether it was made up into a man or not, must have gone out through the one place the continuity was broken. Now, do you want to go through your routine?"

The heavy gate had swung to behind

them. Mansfeld stepped up to it, produced from his pocket one of the square-metal identification keys, placed it in the slot of the scanner-box, and stood to one side. A pencil-beam of light, bright even in the full day, shot from the box, played rapidly across his features, making him blink as it did so. There was a momentary wait, a clicking sound, and the gate swung open.

"You see in this type the identification tag only actuates—" began Mansfeld, but Jones said, "I know how they operate. Do you always hold the tag that way when you put it in?"

"What do you mean?"

"Sort of by the edge, between thumb and forefinger."

"Never gave it any thought. I suppose so; it's the only way to get it into the scanner-box, isn't it?"

Jones spun slowly round on his heel, looking at the horizon. The minor road that ran past the front of the institute and over a low hill was lined with majestic maples, beyond which was a pasture with cows considering their cuds.

"Right about there, I think," said the Secret Service man, and pointed at one of the trees.

"Right about there for what?" said Mansfeld.

"That's where he was waiting, in that tree. With a tele-camera. Probably a movie machine. That would give him more negatives. In fact, with the right kind of machine, he could afford to repeat it on two or three different days."

"You mean somebody photographed me as I was going in?"

"Yep. You or one of the other members of the staff. With a tele, and enough shots, it would be easy to get pictures of the tag good enough to let them make a reproduction of it."

Mansfeld said, "What about the spy-ray?"

"Easy. At the same time he was taking pictures of your tag, he'd be getting good shots of you from all angles. With those on hand, any competent sculptor could make one of those plastic masks



Warburton pulled some experiments which scared the profs

which would be plenty good enough to fool the spy-ray. That's how our burglarous friend got in, all right. What bothers me is how he got out. How many people know the combination of buttons that releases the gate from the inside?"

Mansfeld frowned. "Only about six. And it's changed periodically. But I think the gate can be propped open."

"Did anybody think of that at the time of your disappearance?"

"I don't know. If they did, they didn't say anything about it to me."

Jones sighed. "And a year and a half later it's too late to look for traces. We live and learn. The next question is who it was. How many people knew you were going to duplicate Dr. Draper?"

Mansfeld shook his head. "They went into that at the time, George. It wasn't spread around much, but it wasn't any secret, either. The *Journal of Engineering Chemistry* had an item about it."

"So that any subscriber could have known. Or anyone a subscriber talked to. It narrows the field down a little,



but not much. Well, I think that about winds me up here. It's been great seeing you, Dick. Try to visit us in Washington some time."

They shook hands, and Mansfeld said, "Give all the best to Angela," and the Secret Service man stepped into his cab to begin the journey to New York.

THE HELI delivered him to the roof of the new Federal Offices building on Mott Street, and a few minutes later he was in the F.B.I. Case Executive's office, shaking hands with a tall, lantern-jawed individual, who bore an expression of permanent melancholy and the name of Dewey O'Neill. Inductions were completed, and the explanation made that O'Neill was handling the New York end of the \$3,000,000 robbery.

The executive said, "What's the Secret Service doing in this? There isn't any counterfeiting angle."

Jones explained about the integrator reading, the indicated possibility that there might be a connection with the Braunholzer Institute case, and his selection because he had previously dealt with the institute. "However," he finished, "in view of what I found out at Geneva, I don't think there is any real connection. I'm not an integrator myself, but I imagine it put the two cases together on the basis of method—the disappearance of something from a place to which no one could have gained entry. But I've established the method at Braunholzer, and it wouldn't work for the rocket robbery. Pictures of the Reserve Bank people putting the money in the rocket wouldn't be any use to the criminals. So if you want me to bow out of the picture, I will."

The case executive had a florid complexion and the mustache of an old-fashioned bank president. Now he reached across the desk and picked up Jones's identification tag again. "Hm, you're an F.B.I. Training School man, and a Class Three investigator. We don't often get field men that high up the line ourselves. No, I don't think I

want you out of the picture. You have different methods in the Secret Service and you may be able to turn up some angle we've missed. Especially as the case has just become active again."

"I thought it was sent to the integrator because it was quiescent."

The executive motioned to O'Neill, who said, "Just came off the tapes this morning. Some of the dough has started to turn up."

"It has! Where?"

"El Paso, Texas. You know they had the numbers on all the big bills involved, and sent through a general stop notice to Federal Reserve Banks."

"Yes, I heard the record on the case before I left Washington."

O'Neill gestured. "Okay. Well, San Antonio Federal got one of the five-hundreds. They traced it as far as El Paso, but since the warning only went to Federal Reserves and not to other banks, the trail drops there. El Paso thinks it may have come across the border from Chihuahua, because nobody on the American side has much use for money as big as that. Southwestern District has reported that they have a man on it."

"And the Mexican police at Chihuahua have been alerted to look out for big American bills," said the executive.

O'Neill grunted. "Fat lot of good that will do. If I know anything about those Mexican police, it will only give them a chance to pick up a bill or two for themselves."

"You're too cynical," said the executive. "Well, Mr. Jones, you've heard the record on the case as far as it's gone. Is there anything specific that suggests itself to you that we may not have followed out, or do you just want to take a general fishing expedition into the old evidence? Or would you like to have the record re-played?"

"No," said Jones. "I have a pretty good sono-memory. There were just two points I noticed, or rather didn't notice, when I heard the report. Did you try the *modus operandi* file?"

O'NEILL drew down the corners of his mouth. "That's standard procedure with us. But we were a little hampered by not knowing what the M.O. was. However, we assumed by that it was a question of extracting something from a locked container, like a burglar-proof safe, and set it up on that basis. The file gave us four names." He began counting off on his fingers. "One was Ed Kamienski; he's doing ten years hard labor in the moon mines as an incorrigible, and is very much there. One was Louie the Lug, but he had a perfect alibi for the period of the robbery; wasn't even in New York. The name of one I can't give you because he was psyched and discharged as cured of criminal tendencies; he's going straight, all right. And one was a torpedo named Berent Arnesson, but he waived personal liberty, took a lie-detector test and even a shot of scope, and came out with a clean nose. The file didn't know anybody else smart enough to have pulled such a job."

"So it's a new practitioner," said Jones. "Well, I thought I'd ask, anyway. Second question: I don't remember that the report said anything about whether any employees left the Federal Reserve at the time of the robbery."

O'Neill and the executive looked at each other. Then the former said, "You think it might mean something?"

"Yes. Three million dollars would keep a man going for a long time, or even quite a bunch of them. I'd like to re-examine the case on the basis that it may have been planned as a tremendous one-shot, a lifetime operation. If it was, then we'll probably find at the bottom of it someone with a good previous record; someone good enough to have a job at the Federal Reserve. That's how he'd know when the money shipment was going. After the robbery, he'd quit and probably establish an identity elsewhere until he could release some of the bills."

The executive said mildly, "That doesn't exactly fit with the appearance of the five hundred dollar bill at El Paso

this quickly."

Jones frowned. "I know it," he said, started to say something more, and then stopped.

"All the same," said the executive, "we can't do anything about the El Paso bill from this end, and I don't see any harm in looking into it."

He pressed the button on the desk phone, said into it, "Get me Di Paduano at the Federal Reserve," and switched the visi-plate on. Then he turned to Jones again. "Do your theories go so far as to explain how the money got out of the rocket?"

"I haven't the least idea," said Jones frankly. "I started out by imagining that it had never been in, but after hearing the report, I gave that up."

"You can say that—" began O'Neill, but before he could finish, the face of the banking man flashed on the visi-plate.

"How do you do?" said the executive. "We're re-examining some of the features of that rocket robbery you had, and we found we needed some information. Can you tell us which of your employees have left the service since the robbery?"

"Which of those who knew the money was going," put in Jones from the side.

"Did you get that?" said the executive. "Which of those who knew the money was to be shipped?"

Di Paduano's dark face expressed acquiescence. "I think our personnel records will show that, though I can't be absolutely certain about a given person being aware of the shipment. Want to come over for it?"

The executive looked at O'Neill, who shook his head and said, "Too damn hot on the street," in a low tone.

"I think the phone would be adequate," said the executive. "After all, we both have tap checks, and this is merely an exploration."

"Let you know as soon as I have it," said Di Paduano and his face disappeared. The three men lit cigarettes and relaxed. "What's your idea about the

background of this theoretical master criminal of yours?" said the executive.

"I doubt if he'll have much of any," said Jones. "He'll need to be a technical man, though, with at least a good working knowledge of rockets. And an inventive turn of mind. I'd say also that he has probably never been psyched, or if he has, that he turned out to be psych-resistant."

"Why that?"

"Only way of accounting for the fact that he'd go in for a large-scale crime against the state."

"You got a lot of faith in these government psychs," growled O'Neill. "Me, I think they're a bunch of witch-doctors with political pull."

The bell rang sharply. The executive snapped the key on his phone and Di Paduano's face reappeared. "Hello, Howard," he said. "I'm afraid I haven't anything for you. There haven't been any resignations or dismissals among the people who might know about the money shipment in recent weeks. The last one to leave us was a young man named Warburton, but that was on June fourth, two days before the robbery."

Howard, the executive, looked at Jones, who frowned. "May I come in?" he said, and came around the desk. He was introduced as Mr. Jones, who was working with Howard on the case.

"Can you tell us anything about this Warburton?" he asked. "What did he leave you for? Where did he go?"

Di Paduano registered a certain amount of disapproval. "I wouldn't worry about him. Wesley Eustace Warburton was one of our brightest young men. We had him in the balances department because he was so good with mathematics, but he was really interested in electronic chemistry, and had been studying it nights at Columbia. I understand he left us to go to the Deering Chemical Company."

"What about his back record? Where did he come from? Was he ever arrested, or psyched on order?"

Di Paduano's expression became one

of positive shock. "May I remind you that your questions are an invasion of personal privacy unless you have a court order or a *prima facie* case against him? I'm afraid you'll have to ask someone else. Good afternoon."

The face disappeared. Jones looked around at the others. "Now, what in hell was chewing his liver?" he said.

"O'Neill laughed. "Don't you know that the Federal Reserve Bank, like everything else that's federal and has money connected with it, is slightly political? I bet you stepped on his white-haired boy, especially with the suggestion that he might have been psyched on order."

"That may be, but this Warburton fits the picture I've been drawing altogether too closely for comfort. Look, at least he has a good enough record so that nobody raised any objections to his getting into the bank; he knew the money shipment was going; he quit at about the right time; and he has technical knowledge. Do you F.B.I. people use probability analysis?"

The executive rubbed his chin. "You ought to know, if you went through our school," he said. "And you ought to know that those are only second-order probabilities, because you haven't demonstrated that any of those characteristics are absolutely inseparable from the robbery—except for the technical knowledge."

"But I agree the probability is high enough to seek a little more light. Let's see, O'Neill, you're familiar with the background. See if you can find out this Warburton's address, who his friends are, get a picture of him—the general personal investigation. It will be more efficient if you, Jones, take the other end—that is, look up the man himself at Deering Chemical. Indirectly. If he's as acute as the person you've pictured, he'll be pretty careful about new acquaintances who ask questions." He looked at his watch. "Conference at sixteen-thirty tomorrow. All set up for the evening, Jones, or would you care to

have a couple of drinks and see a tri-di at my club? Don't know what they'll have on, but it's usually pretty good there."

### III

**J**ONES staggered into the bathroom, groped the bottle of hexamerone off the edge of the wash basin, poured himself a man-sized slug, turned on the shower and sat down under it to wait for the dose to take effect. The building was still revolving, but at a slightly lessened rate, when the phone rang. He swore, wrapped a towel around himself, and hurriedly got back into the room in time to cut the visi-plate.

As he had more than half expected, Angela's voice came out of the device: "And how is *your* hangover this morning, my dear, with the visi-plate off? Is there enough hexamerone in New York to take care of it? Or shall I—"

"Listen," he said, "I'm in a foul mood, and if you don't lay off, I'll go back to the institute, get another duplicate of you and elope with her. So there."

"If you do, I'll have Dr. Runciman duplicate your worthless carcass and elope with the result. Remember, he's a friend of mine, too. How's the case?"

"It's turned into two cases, and one of them I don't think I'm going to win any promotions for. The other one looks fairly hot. It's—"

"I've got biscuits in the oven, and can't wait to hear about it now."

The hexamerone was taking hold and the hangover sensations were practically gone, as Jones recognized the little code he and his wife used when there was something to say, but they didn't quite trust the tap check. He made his voice cheerful and casual.

"Okay, dear, don't let them burn. Give you a ring when I get off the job." That meant he would call back as soon as he could reach a safe phone. The connection clicked off.

Jones finished drying himself where he was and dressed rapidly. He had

taught himself not to speculate in the absence of data, and carefully tried to keep his mind a blank, but a wave of anger swept through him at the thought that somebody or something had been bothering Angela. It wasn't the first time politicians had tried to interfere with his cases in one way or another, but damn it, why couldn't they mind their own business. Or maybe that was their business.

Outside his hotel window, New York lay under a glare of brilliant July sunshine that promised a day even hotter than the one before. He gulped a cup of coffee from the Servo, and caught an air-conditioned taxi, giving the address of the Federal Offices building. At least the phones there would be immune to taps. Angela's face flashed brightly on the screen in the booth.

"Feeling better now, darling?" she said. "You should really have a recording of your voice this morning to remind you that strong drink is ravaging."

"Never mind that," said Jones. "What's the story?"

"It's nothing serious, I think," she said. "Just that somebody's been snooping around to find out what case you were on. Last night. Cliff and Marie were over, and they told me. Cliff thinks the chap was a Treasury man."

"Oh," he said. "Well, don't worry about it. I just had a momentary spat with a big pot of a banker."

"All right, darling. Take care of yourself. 'Bye, now."

Di Paduano, thought Jones, as he clicked off the circuit. Federal Reserve Banks were under Treasury. He must have worked pretty fast, too. Which meant that he must have been plenty disturbed over the inquiries about Warburton. Which meant in turn that there was something very peculiar going on somewhere. Jones considered the possibility of Di Paduano himself being mixed up in the rocket robbery, as he endured the puff of heat on the street while waiting for a taxi to take him to

Brooklyn and the plant of the Deering Chemical Co. Three million cash might be enough to attract even a man who had worked up to the position of governor in the Federal Reserve system.

But no, it wouldn't fit, he decided, as the cab slid smoothly into the old Brooklyn tunnel. Di Paduano would have no opportunity to establish the alternate identity for the enjoyment of the proceeds which his theory required. Also there was the slight matter of physical accomplishment. Jones's memory readily yielded from the record the name of the governor who had seen the money aboard the rocket; it was not Di Paduano, it was Morton. If Di Paduano had monkeyed with the money-bag, it must have been before the money was packed, which didn't seem likely. It was conceivable that somebody might have worked some version of the gypsy switch in packing the bag, but in that case the bag would have been full of newspapers when it reached San Francisco, and it wasn't; it was empty. It was not conceivable that Morton had allowed an empty bag to be placed in the rocket. The whole thing made up one of those departures from the norm which the Chief was always warning him to look for, as indications that there was something more to look for, but as yet there was no explanation.

**T**HE Deering Chemical plant sprawled along the harbor front, neat and very clean, with the smoke-disposal caps on its chimneys looking like exaggerated onions. The taxi swung past an ornamental hedge and stopped before a door of classical simplicity. Inside, the conditioned air was perfumed with the fragrance of pine forests. It would be, thought Jones, as he gave his name to the goddess with a neckline cut way down to here, and asked to see the personnel manager.

The goddess said they weren't hiring except for second-class technicians, blinked rapidly at Jones's credentials, did something with the whisper-phone,

and told Jones he could go in.

He found a fat man in a pink-striped suit, who offered a hand without getting up, announced his name was Esselstein, and ostentatiously switched on his desk recorder.

"Just to make certain that you don't try to trip me into violating the personal liberty laws," he said, amiably. "I've met you federal people before."

Jones said, "I don't want to ask you anything that would violate P.L. Just wanted to ask whether your records included a picture of a young chemist who joined your organization recently. Name of Warburton."

"Warburton!" Esselstein reacted so violently that it seemed likely the elastic chair would pitch him over the desk. "No, we don't have a picture of him, and I'll tell you why; he doesn't work here and never did."

Jones lifted his eyebrows. "He left his previous place of employment on June fourth, saying he was going to report to you on June fifth."

For answer, Esselstein pressed a button on his desk.

"Bring me that Warburton file, will you?" he said, and then reached over and switched off the recorder. "I'm glad to see that somebody's looking him up. Has he been up to something?"

"Not that we're sure of," said Jones, as a girl brought in a brown file which Esselstein opened.

"I'll be glad to give you all I can about him," he said, "and since he never actually joined us and completed his employment records, there's no violation. The fact is that he applied for a job here, got it, and then never showed up to go to work. You're wrong about the date, though; it was June twelfth he was to report, not June fifth."

Jones made a note. "Here we are," said Esselstein. "Wesley Eustace Warburton. Gave his birthplace as Lubbock, Texas. Unmarried. Graduated from Columbia, night course, with honors. Current employment when applying, Federal Reserve Bank of New York,

which recommended him highly. That much we checked, but to get any more about his background, we'd have to wait until he was actually employed here. He applied to us some time in April—here it is—as an electronic chemist. We have a very complete system of psychological and technical examination at this place, and Warburton passed everything with the highest grades, almost, of any prospective employee we ever had. I was convinced that Deering was getting a real prize, and he seemed very happy to join us. But on June twelfth, when he was due, he never showed up, didn't answer phone calls or letters, and when we sent someone to where he lived, they said he had moved. All the Federal Reserve would give us was that he had left there. He seems to have just disappeared."

"Did you try Lubbock?" asked Jones.

"That would be pretty close to a violation of personal privacy, wouldn't it?" said Esselstein. "No."

"Where did he live?"

"Three hundred fifteen West Twenty-eighth St., New York. His phone had been disconnected," said Esselstein, glancing at the folder.

"You saw him yourself, I suppose? What did he look like?"

Esselstein closed his eyes. "Medium height, about five feet seven, I would say. Very pale blond hair. Quite well set up."

"You don't know the Echols system of describing a man by his walk-rhythm, do you?"

Esselstein chuckled. "No, I've tried fooling with it, but it takes a little too much memory work and is a little too complicated for me."

"Too bad. And you haven't anything else about him?"

"Not a thing. The research department here was not very happy over missing out on someone who promised to be a star chemist. There aren't very many in the electronic end, you know, but we just supposed he had a better offer somewhere else, and as he hadn't

signed any contract, there was nothing we could do about it. Want to tell me why you're trying to trace him?"

Jones hesitated. "I'm afraid I can't tell you very much. It's a Federal case, with quite a few involvements. But I'll tell you what I will do. If we find him, or find out what happened to him, I'll phone you even before it's released to the newscasts. And thanks."

"It's a deal. I'll tip you off if anything else turns up." This time Esselstein stood up to shake hands.

**B**ACK at Federal offices, Case Executive Howard opened the conference. "I have two pieces of news, one negative, and one not very good. Southwestern District is almost certain that five hundred dollar bill came through from Mexico, and the Treasury Department has put through a request to know by what legal warrant you are on an F.B.I. case, George."

Jones shook his head. "You know the answer to that. Can they have me pulled off?"

"In time, no doubt. Meanwhile, I can delay matters for a week or more with an application for your services on technical features of the case. I've taken care of that. I presume we owe this to our cooperative friend, Di Paduano."

"I wish I could see some connection between him and the case, or between him and Warburton, for that matter," said Jones. "Did you find any, Dewey?"

O'Neill studied the ends of his fingernails gloomily and shook his head. "I didn't find any connection between anything and nothing," he said. "The first thing I done was go around to the bank about lunch time. There was two or three of the guys there I got in pretty good with when I was fresh on the case, and I figured on maybe taking one of them to lunch and opening him up with a couple of swift drinks. The first part worked swell; I got two of them instead of one, and when I told them one of the bills from the robbery turned up, they started to talk like hell, but as soon as

I said something about Warburton, they looked at each other and then clammed up."

"It would seem to me," said Howard, "that there's a distinct difference in the way those Bank people approach the two questions—the robbery and Warburton."

"It's an inconsistency," said Jones, "and it will have to be cleared up. What next?"

"Next I took the Columbia angle. They knew all about him up there. He was one of their star pupils in the night class. I got an address for him—"

"Three hundred fifteen West Twenty-eighth Street?" asked Jones.

"That's right. Haven't had time to check it yet. I also got a good description, but no picture, and none of the profs knew the Echols system, but I did show them the ear cards, and got them to agree that Warburton's were B-4s. They said he never mixed much with the other students, or went in for the regular college business. He was older—late twenties, they guessed. But he was a hell of a hot shot in a classroom, and even pulled some experiments that scared the profs."

"What kind?" said Jones, with interest.

"Didn't say. In fact, I got the idea they were clamming up on me a little on that. But that's the works. What have you got?"

JONES gave an account of his visit to Deering Chemical, and descriptions were compared. They checked. Howard said, "I think I'll ask Southwestern to put a man on the backtrack at Lubbock. We might turn up something there, and this disappearance of Warburton at the time of the robbery certainly gives us adequate reason to violate his liberty a little, even if he's not our man. Now—"

Jones held up a hand. "There's one more discrepancy I'd like you to note," he said. "And it's one that enormously strengthens our case on the personal

privacy angle. Warburton left the Federal Reserve on the fourth, before the robbery. But the first time he was due anywhere else, that is, the first time people began looking for him, was on the twelfth. That covers the period of the robbery and still gives him time for a getaway."

"I agree," said Howard, and then frowned. "We can't get over the question of method, though. Well, I think the next thing is to try farther along the backtrack. Maybe we can find someone at Lubbock to make a complaint that will bring Missing Persons into it; they have a good line of stools and could help us out a lot. In the meanwhile, George, suppose you spend the evening checking that address where he lived, and you, Dewey, try to get hold of one of those bank employees by himself and do a little roping."

"I see it another way," said O'Neill. "This Warburton seems to be the fair-haired boy everywhere. What if we got a murder or a snatch case on our hands—hooked up with the money; somehow?"

"The possibilities are—" began Howard, when the phone rang and a secretarial voice said, "Can Mr. Jones accept a call? The man says it's urgent."

"Put him on," said Howard, and moved from behind his desk to let Jones come round. The chubby face of Esselstein looked from the plate as he turned the voice up to room amplification.

"Oh, hello, Jones," said the chemical firm man. "With regard to that person we were discussing today, Miss Kirsch tells me something I didn't know when I talked to you. On the fourteenth, two days after he was due here, some woman who wouldn't show her face called for him on the phone, and then again the next day. And the receptionist says that about the eighteenth there was a man around inquiring for him. She thinks he might have been a detective, but he didn't show any credentials, and you know how those girls are."

"Thanks a lot," said Jones. "I'll let

you know if I find anything."

He switched off and turned to the others. "Maybe it is a snatch at that," he said. "Confound it! I'd like to put this whole business into an integrator. It's getting too complex for me to handle."

Case Executive Howard grinned wisely. "The integrator won't accept human theories or emotions," he said. "That's why they pay us our salaries."

#### IV

**T**HREE-FIFTEEN West 28th Street proved to be one of those buildings of down-at-heel magnificence, built during the '70s, when the rage for colored glass brick was on. The chromium flashing was ripped here and there, the door to the under-building garage was not quite closing, and the walls bore the marks of the inexplicable games children play with chalk and balls. There was no visi-plate at the door, only an entrance with a row of bells. Over the bottom one was a tag that might at one time have said "Supt."

Jones pushed the bell. After a wait of more than appropriate duration, there was a sound of feet within, and the door came open on an individual who had apparently not been able to afford his depilatory for the last three days. "What is it?" he said.

His breath smelled. "I'd like a little information about a man who used to live here," said Jones.

"Which one?" said the individual, and scratched.

"His name is Wesley Eustace Warburton."

"Oh, him. He moved away. Didn't leave no address."

"When did he go?"

"I dunno. Some time in June, I guess."

"How far was his rent paid up?"

"I dunno. You have to ast the agent that."

"Did he have much stuff with him?"

"I dunno. Wasn't here."

"Look here, my friend," said Jones,

in an exasperated tone, "it strikes me that your memory is pretty poor. Isn't there anyone around here that knows at least some of the answers to these questions?"

The thick lips came out in a pout and the eyes shifted. The Supt. murmured, "The last guy that ast gi' me five dollars."

"Well, I'll give you a trip in the pie-wagon." Jones flashed his identification. "This is a Government case, and you can talk or else."

"You can't make me talk. I got my personal privacy."

"Save that one for the birds. I'm not asking you anything about yourself, unless you had something to do with his going away. Now are you going to talk to me here, or come down to the Federal Building and talk under a machine?" Jones felt for the handle of his needle-gun; sometimes these sterling characters turned nasty.

The Supt.'s eyes followed his motion. "What you want to know?" he said.

"When did Warburton leave?"

"Night of June fourth."

"How did he go?"

"I dunno. Honest, I don't. I think he went down to the corner and just took a taxi."

"Did it look as though he were going away for good?"

"He had two big bags with him. When I went up to his room afterward, there wasn't nothing in it. Not a thing."

"But he didn't tell you in advance that he was moving out?"

"I'm telling you, mister, I don't know nothing about how long he was going away for, or what. He comes down in the elevator with them bags and goes out the door. Nobody called for him, or nothing."

Jones had-questioned enough unwilling witnesses to be fairly certain that he was getting as much of the truth as he could obtain without a lie-detector. He switched the line: "Well, while this Warburton was living here, did he have many people visiting him?"



THE THOUGHT appeared to strike the Supt. as new. He cocked his head and considered it slightly. "Not many. There's one guy I notice, comes around two-three times and they go out together. Some kind of a Spaniard, I think. At least he looks like one, but I never hear him talk."

"All right, what else did he look like? Tall or short? Fat or skinny? Tell me about him."

"He's about medium height, not very fat, and he looks—well, I dunno, he just looks like a kind of Spaniard, you know." The voice ended on a note of indignation over the effort required by the obviously impossible task of describing another person.

Jones said, "Did they seem to be very friendly?"

"Mister, I dunno. All I know is, he comes here two-three times, and once he brings one of them frozen dinners and takes it up."

"Did Warburton have any other regular visitors? Women, for instance?"

"I never see none. He used to go out a lot, every night almost."

"Yes, I know. He was going to college at night. How did he live otherwise?"

"I dunno, what you mean."

"Well, you or someone must have been in his room to clean it up. What did it look like?"

"Oh, I get it. Just like a room, you know. He didn't even have a television. Only some books and tapes."

"What became of them when he went away?"

"I dunno."

"Well, could he have carried them all in the two bags you saw him with?"

This appeared to cause the Supt. another spasm of thought. After giving it reasoned consideration, he came out with, "Maybe not. There was a lot of them tapes, and the machine to work them. He had some kind of electrical machine, too."

"I see," said Jones. "Now, there's just one more thing. You said that someone came here asking about him

after he left. When was it, and who was it?"

"There was two of them. The first one was a dame, about a week after he leaves." The Supt. gave a sidelong glance and gestured with his hands to indicate a shape of appreciable form. "Some babe! She drives up in one of them Cardigan two-seat bubble cars, the kind with the one wheel in front."

It was no use asking him to describe her. Jones said, "Had she ever been here before?"

"Not that I seen."

"Okay. And who was the other one that asked for him?"

Supt.'s voice held contempt. "One of them correspondence-school dicks. About two, three days after the dame comes round. He's the one gi' me five bucks."

Jones reflected that he probably didn't get his money's worth, but people who work on expense accounts can afford not to care. He said, "How'd you know he was a private eye? Show you his tag?"

"Listen, mister, I been around. He even tries to get me to leave him alone in the room, see? I dunno whether he wants to put in a tap or make one of them dust collections, but he don't get away with it."

Yes, I'll bet not, thought Jones; if another five dollars followed the first, there probably isn't a speck of indicative dust left in that room that could be taken out with a high vacuum.

He said, "Okay. Thanks. I'll put it in the record that you've been very cooperative. What's your name?"

BACK at the hotel, the light was on beside the phone, and when Jones switched it to get the record, the voice of Case Executive Howard came out.

"If you get in before midnight, call me at my apartment, Eldorado 72-6636." The voice that answered when he obeyed this injunction said that Mr. Howard had gone out, but would the caller make a record? Jones did so, then

deciding that going out to a tri-di would only cause another miss, and that he couldn't be bothered with any of the programs offered by the television, he put in a call for Angela, talked to her for a few minutes, and then sat down for a rather disconsolate wait, with a Scotch-and-wonderfizz for company.

The possibility that Warburton's disappearance had been involuntary was pretty much out of the picture now, he decided. The fact that the chemist had denuded his room of the tapes, books and electrical machine that couldn't have gone in the bags, pretty much kicked that out the window. It was a planned operation, a real disappearance, which made his own theory that it was somehow connected with the rocket robbery stronger and stronger. The thing had been carefully rigged, and for some time back.

But finding Warburton did not promise to be easy. In his life at home, as at college, he apparently kept pretty much to himself—except for the “kind of a Spaniard” who brought a package of frozen dinner. At this point in his meditations, Jones' memory was jogged by the fact that one of the bills had turned up on the Mexican border. The “kind of a Spaniard” could have been a Mexican; and Warburton had come from Lubbock, Texas. Was there a connection?

Also, Warburton's disappearance had disturbed someone else enough to make them put a private detective agency on the job. In spite of the fact that the agencies could and did keep their records secret, the right people in the police could usually find out, and Jones made a mental note to ask someone in the New York police to find out who was interested in Warburton. A woman, pretty clearly; the unknown female voice that had called Deering and the “babe” who had asked for him on 28th Street were obviously the same, and the private investigator who followed up her own failure to obtain anything definite was quite as obviously the by-

product of that lack of success. Jones made a mental note to have the marriage records checked; there was just a possibility that the babe might be quietly married to Warburton, after all.

The trouble was that any one of those reasons furnished an adequate motive for the disappearance all by itself, without bringing in the robbery. This double motivation, in fact, furnished one of those inconsistencies the Chief was always talking about. Either both were operative—and the woman was in some way connected with the robbery—or only one of them was; and since his disappearance was somehow connected with the woman, this would mean it was not connected with the robbery.

A little dismayed over the fact that his reasoning was threatening to take him right out of the case, Jones got up to put it on a record for the next conference with the Case Executive, when the phone rang.

“Hello, George,” said Howard's voice at the other end of the line. “I'm not putting this on visual. This is a public phone without a check. But some more of that stuff has been turning up, right here in New York city. I'm working on it now, and so is Dewey O'Neill. Meet you in the automat drugstore at the corner of Broadway and Seventy-second as soon as you can get here.”

V

**T**HE PINK and blue enamel booths of the automat drugstore were full of high school youths, chattering feverishly, mostly about the day's game between the New York Giants and the Los Angeles Angels and the pitching of Alinda Kenny, the Angels' new girl star. Jones passed one in which Howard was sitting alone, gloomily contemplating a cola drink. Howard did not look up, so Jones pushed on past to the rows of vending machines, picked out something that advertised itself as “Caribbean

Star-apple," inserted his coin and took it back to the booth.

"Mind if I sit here?" he said in a sufficiently loud tone, and as the other shook his head, slid in. "What's the pitch?" he asked in a lower tone, not looking at him.

"One of the fifties came into the Federal Reserve this afternoon. They checked back and found that some of the ones and twos had been coming through, too, which is all right. You couldn't expect them to keep a warning on bills that small."

"Here in New York?" asked Jones. He sipped his drink, and made a face as he found it was just as bad as he expected.

"Yeah. The fifty came from the branch of the Chemical on West End Avenue. I got the city police on it, and they traced the bill to a store over on the Drive, at Seventy-eighth Street."

"Why the cover?"

"I picked up a tail at the store."

"Where is he?"

"Three booths down."

Jones pursed his lips in a soundless whistle, then, still without looking round said, "Okay, I'll take it. Put the dog to bed."

He dropped the remainder of the Star-apple and its discardable container into the chute, slid out, and walked rapidly to the door. He slipped around the corner, and stood waiting. The only persons to follow him out were a pair of teenagers. The probability that they would be shadows was low; nevertheless Jones decided to forego the blandishments of a passing taxi and set out on foot westward through the humid heat of a New York summer night.

It was not an assignment he particularly cared for, in that section where the magnificent apartment buildings of an earlier day had run down into many-storied rooming houses, crowded with tough characters. Officers of the law had been known to get a gelatin slug in the back of the head and to be re-

lieved of everything they owned, merely because they were the law. Jones did not flatter himself that his cover was so good as to make him unrecognizable.

The streets were full of children screeching over their games, and on the steps were groups of boys and girls. As he passed, one of them, there were furtive glances at the Secret Service man, and Jones saw a bottle passed rapidly from one hand to another. It was probably trujillo, the terrible stuff that is both liquor and dope; but that was none of his business at present, and he pushed on without appearing to notice.

The lawns along the Drive were covered with more groups; the store on the corner of 78th proclaimed it was a "Charcuteria" in hot red electric letters that wiggled. It wouldn't be much use putting his question directly in a place like that, Jones decided, and taking his subject in would lose too much time. He would have to plan a campaign.

**THE PLACE** was darker inside than it looked from the outside, with cheeses in bags hanging overhead like sleeping bats, and bins of fruit. A fat woman with a slight mustache regarded him with some disfavor as he looked over the goods in the plastex case. He indicated one of a series of closed dishes marked "Arroz con pollo—to heat" and said, "How much?"

"Seventy-fi'," said the woman.

"I'll take it."

She got a bag for the merchandise. Jones produced his wallet, looked in it, and gave an exclamation. "I'm sorry," he said, "but I don't have any change. Can you break a twenty for me?"

The woman extended her hand across the counter, accepted the bill, and took it toward the light at the back to scrutinize it. "It's all right," said Jones. "Though I don't blame you. You probably don't get too many big bills here." He was cudgelling his brain for a better lead, when she surprised him with:

"You gon' ask about that, too?"

"You mean the fifty-dollar bill? Has somebody else been asking?"

"You gi' me money, I tell you." The hairs of her mustache trembled slightly.

"How much money?"

"Fi' dollars."

She was a Latin.

"Too much," said Jones. "I'll give you two."

They batted it around for a while, finally reached an agreement that three and a half would be a fair price for the information she had to dispense, and she leaned across the counter.

"All ri'," she said. "This fifty-dollar bill is gi' me by Jesus Perez. He's a no-good man; I think he sell trujillo."

"Is he a Mexican?"

"I do' know. I guess maybe."

"Did you ever see him with a blond American?" Jones described Warburton as nearly as he could without having seen him.

"No, never seen him."

"Where does this Jesus Perez live?"

"I do' know. Round here, somewhere."

That was a setback, and it was no use asking for a description of him, either. However, if his name was really Jesus Perez, and if he was enough of a character to merit the description of "no-good," he probably had a record. But that would take time.

"How often does he come in?"

She gave an expressive shrug. "Sometimes, sometimes not. Most late night."

"Has he been in tonight?"

"Not yet."

Jones made a sudden decision. "Look here," he said. "I'll tell you what I'll do. I've got to find this Perez, and if you help me, I'll make it worth your while. I'm going across the street, where I can watch your window. If Perez comes in, I want you to move one of those melons into the window. If you'll do it, I'll give you five dollars now and five more after I find him."

An expression of peculiar craftiness spread across the woman's face. "All

right, I do it," she said, and held out her hand.

The heat outside hit Jones like a hammer. Children were still running and little groups still walking about the street, but he selected a stoop across from the "Charcuteria," settled himself with the air of a man who could do no more in such weather.

The tail Howard had picked up was probably an agency man—the same agency that had been looking for Warburton. And almost unquestionably, whoever had been asking about the fifty-dollar bill before Jones himself had also been an agency man. But how had the agency learned so quickly of the appearance of the fifty-dollar bill from the robbery? There seemed only one satisfactory answer to that. They must have received the information from Di Paduano, governor of the Federal Reserve Bank. But why had he put a private agency on the case while reporting the appearance of the money to the F.B.I.? The answers to that were a good deal less satisfactory; in fact, they were not present at all.

Then Jones remembered something else. He himself had already made the connection, within a high degree of probability, between the agency and the mysterious woman who was looking for Warburton. If the agency now stood convincingly connected with Di Paduano, then Di Paduano and the woman were connected. Things equal to the same thing are equal to each other.

Across the street, the woman with the mustache stepped to the window, took out a bottle of vinegar and replaced it with a melon.

The man who had come out of the Charcuteria with a plastic bag in his hand was short, and in the red glare of the light, he looked extraordinarily broad-shouldered. Probably a shiv man, thought Jones, as he threw away the remains of his second cigarette, got slowly to his feet, and began sauntering east on 78th. He didn't look too often at Perez, but often enough to catalog

and classify his walking-rhythm according to the Echols system. He didn't seem to be in any hurry and at the corner he waited patiently for a bus to go by. In the next block, he went to the second building and ducked in. Jones waited for long enough to make sure it wasn't a trick, which it might be if Perez had any idea he was being followed. Then he slipped over and noted the number, 353, with the word "Rooms" in the hall over the row of bells. If Perez had the \$3,000,000, he certainly wasn't making much of a splash with it.

Jones turned into the avenue, located a drugstore of the non-automat type, and found the phone—one of the old kind, without a visi-plate. The duty man at F.B.I. said Howard was still out. Jones told him that the big deal was nearly closed, but he needed a witness, and gave the address. "The name on the door is Jesus Perez," he said, and the duty man said he would have the local office take care of it.

That meant that a police squad would be on hand to cover any exits at the rear, and that Howard was probably still entertaining his shadow, the agency man. Jones felt good as he rounded the corner again to keep an eye on 353, stepping toward the curb to avoid a group of three men coming along abreast.

**I**T HAPPENED so quickly that he didn't even have time to react. The group apparently split to let him past, then as he stepped forward, a line of snake-wire whipped from one to another and was around his body, pinning his arms to his sides as they closed in.

"Don't worry, Fed," said one of them. "We aren't going to hurt you. We'll just keep you on ice for a while, till we do some business."

Too late, Jones remembered that the proprietor of the Charcuteria had taken a bottle of vinegar out of the window when she put the melon in. The agency boys must have reached her first. That

was why she had smiled.

"Some of you dime-store dicks are going to find yourselves without licenses," he said, bitterly.

One of them laughed. "Leave us take care of that," he said, "and come right along and get your lollipop. Don't start yelling copper. It'll get you a pop on the head in this neighborhood." They were urging him gently up the hill, away from 353, surrounding him so closely that the snake-wire would be invisible.

Jones formed a mental picture of the police squad arriving just in time to let Perez slip through their fingers because they didn't know who they were looking for. He filled his lungs desperately, and at the top of his voice, shouted, "Fire!"

The one on the right hit him. The one on the left let go.

Jones yelled again. "Fire! Fire! Fire!"

All down the street people were turning, heads were being thrust out of windows. A couple of lights went on.

One of the trio said rapidly, "I'll cover it, Larry. Get this yap out of here." He vanished as a little group began to gather. Jones felt the snake-wire whipped from around him, and his arms were gripped hard. One of the agency men addressed the group of five or six! "It's all right, everybody. He's just loaded up with trujillo!"

"I am not," cried Jones. "There's a fire in 353. These guys started it!"

The group was nearer ten than five or six now, and he was beginning to get them. In a crowded tenement district, the arsonist is a deadlier enemy than the policeman. Someone said, "What for you hold him?"

Unfortunately, one of the agency men was quick on the uptake, too. He swept his free arm around in a sweeping gesture. "Listen, everybody," he shouted, "this guy is just a nut. Somebody beat it up to the corner and turn in an alarm, and we'll see if there's a fire. You!" He pointed at the objector,

who glanced over his shoulder, shrank back a step, and then under the impulsion of that monitory finger, began to move in the indicated direction.

In a conversational tone, Jones said, "You guys won't get away with this. This is Federal heat."

"Yeah?" said the other one. "You don't know how much punch we got behind us. If you—"

SOMEBODY yelled, "Look! Cops!" Jones saw heads swinging to a point behind and over his right shoulder. The man on that side let go; he swung round just in time to see the big plastex bubble swing gently down from the helicopter overhead, and a pair of blue policemen leap out, riot-guns ready. The bubble whirled upward again and a day-light stabbed down brilliantly onto the doorway of 353, just as it swung open and two men dashed down the steps. One of the policemen tried to halt them; there was a flurry of action, the policeman went down, Jones saw a hat come off a head so brightly blond that it looked white in the daylight, and the pair were lost in the shadows and the crowd that immediately began to gather. He pushed aside a gaping Chinese and rushed forward, waving his identification tag.

The cop who had been knocked down was on his feet. "Get that blond guy!" cried Jones.

"Not in this neighborhood, chum," said the cop. "You pick him up later. You the guy that called for the squad?"

"Yes, but it's probably too late," said Jones. "Let's go in anyway, though. I think I have a big-time hood stashed in there. Have you people got the back covered?"

"Yep. Roof, too. We always make the cover-drops first on these jobs. The lieutenant turned on the heat as soon as he saw what the address was."

"All right, let's see what we got left," said Jones.

He stepped into the hall, followed by one of the policemen, while the other

put his back to the door and faced the murmuring crowd in the street.

Before either of them could ring, the inner door was opened and a thin woman, a robe clutched around her, was saying, "If you want Mr. Perez, he's in Three-B."

Jones glanced at the arrangement of the hall. "You come up the stairs," he told the cop. "I'll take the elevator."

It was ancient and decrepit enough to belong in a museum, one of the old self-service type of fifty years before. Jones produced his needle-gun and stepped out of it just as the officer made the head of the stair-well, riot-gun held purposefully forward.

"No use knocking," he said, and strode forward to grip the door-handle of 3B.

It opened without resistance on what had once been the living-room of a small apartment, now chiefly occupied by a bed, dirt and disorder. The lights were on, but unless there was someone under the bed or in the bathroom, the place was empty. The window was open.

Jones had taken two steps toward it when someone came over the sill with raised hands, and behind him followed a policeman in blue. As classified by the Echols system, his walk was assuredly that of Jesus Perez. But the utterly astonishing, rather frightening thing was that Perez was wearing the head and face of Dr. Richard Mansfeld, chemist of the Braunholzer Institute.

It worried Jones for only a moment. Then he said; "Let's get that plastic mask off and talk business—even if the best fish got away."

## VI

THE SHORT MAN in the chair by the window was named Swigart. He was a New York detective.

He said, "We did everything we could, but we couldn't get a crack out of him. He sticks to it that he got the nine hundred and fifty playing the races."

Howard permitted himself a faint smile. "And all the bills in the lot were new and came from the missing rocket shipment," he said.

Swigart snorted. "What can you do? The first thing he did was yell for a mouthpiece, and the springer won't even let us put the lights on him. Personal liberty laws!" He snorted again, resignedly.

"I'd expect anyone with a record like his to know all the loopholes," said Howard. "You know it, don't you?"

"I knew he had one, that's all," said Swigart.

"It came through about an hour ago. This will be news for you, too—" he addressed Jones— "Jesus Perez, Mexican descent, born in Lubbock, Texas. Twice given psychiatric treatment and eventually sent to the moon mines as an incorrigible. Served four years of a five-year sentence."

"The case is tightening up," said Jones. "Warburton is from Lubbock, too. As though we needed that item of proof."

Howard said, "Yes, and there's something else. Southwestern District reports that Warburton has a record, too."

"He has? What for?"

Howard shook his head. "That is what I'm afraid we're not going to find out unless Warburton tells us himself. It was for something that happened while he was under-age. He was psyched, and discharged as cured of criminal tendencies, so the record comes under personal privacy. The people at Southwestern only found it out by accident. He hasn't any relatives there, and they were tracing general records at the city hall, when they found a closed-case card on him. By the way, there's no educational record for him beyond high school."

"What beats the hell out of me is this," said Swigart; "if this Perez was in on the rocket robbery, what did he do with the rest of the money? Beside what he spent, nine-fifty is an awful

small dose to have left out of three million."

Howard said, "I have a theory that will furnish a partial answer to that. The first bill that turned up was a five hundred, in El Paso, thought to have come across the border from Mexico. I think we'll find that Mr. Jesus Perez has parents, or perhaps a sweetheart, south of the Border, and that he has passed part of the money over for safe-keeping. At least, we're having the Mexican police check. I don't suppose he said anything about his contacts down that way?"

"Not a thing," said Swigart. "The only thing he was willing to talk about was the robbery. He said he had an alibi; that he was in Chicago the day it was pulled. We asked Chicago to check that, but I'll bet all the tobacco in Kentucky that it turns out to be right. He wouldn't have been so willing to come out with it unless it was airtight."

"All right, then, what's the next step?" said Howard. "I take it you established those agency people were from the Owl, all right?"

"Oh, yes," said Swigart. "The two that were holding Jones didn't have time to make their getaway before the fire truck closed in, and the locals turned them in. They had to do some fast talking and show their identification to keep from being hooked on the false alarm rap. But the Owl wouldn't tell us who they were working for. Must be somebody with plenty on the ball, though. The Owl is usually pretty cooperative."

Jones said, "Would three million dollars be enough on the ball to make a difference? From the description, one of the men who ran out of that joint just as I got there could have been Warburton."

"Three million would fix you quite a few operatives, all right, but it would be peanuts for the agency as a whole. And it's the agency that's making the trouble," Swigart said.

**B**Y THE WAY, Jones, did you get enough of a look at the one you thought was Warburton to set up a classified description?" Howard asked. — Jones shook his head. "I wasn't near enough to get his ears or nose. I think his walk would fall in the JM-22 group, but he was running and I got only a short glimpse of him. I couldn't carry it any farther than that."

"All right," said Howard. "Now before we go any deeper into the matter of the Owl and who hired them, I'd like to get the Perez matter cleared up. You searched the place, Swigart. What did you get that might furnish a lead?"

"Practically nothing. No weapons, no tools, nothing we could put the bee on him for having except that money. We've got him booked for receiving stolen goods, but even that's weak. The only tie-up with the robbery, if it is one, is this." He laid a piece of paper on the desk.

Howard picked it up. "A receipt for the shipment of one box, special handling, from New York to San Francisco by rocket express, addressed to Juan Fernandez, 2303 Noriega St. Did you ask him about this?"

Swigart said, "Yes. It made him nervous, all right, but he didn't know anything about it. Said it must have been left in his room by the guy who had it before him."

"You noticed the date on it? The shipment must have been made on the rocket that was robbed, or the one before."

"I did that."

"What about Juan Fernandez?"

"I called Frisco myself on it. There isn't any Juan Fernandez at that address."

Jones said, "There's an angle I'd like to have you people consider. That entry at the Braunholzer Institute, and the disappearance of a batch of materials for duplicating a human, means there's something more than a strong probability that there is a duplicate of either Perez or Warburton wandering around

somewhere. In fact, the existence of that plastic mask of the chemist at the Institute practically proves it. The use of the mask is the only way anyone could have gotten into the institute. I established that myself. Now, Warburton's a chemist, and could have operated the machine. Perez isn't. I think it was probably Perez who was duplicated. In that case, either the Perez with the alibi in Chicago, or Juan Fernandez, who received the box out in San Francisco, could be the duplicate. That would be a natural name for him to take."

"What is this other case?" asked Swigart.

Howard told him, and then said, "Let's see; was the original Perez, the one with the moon-mine record, right or left-handed? Right-handed. What about the one you have down there in the pokey?"

Swigart said, "He's right-handed, too."

"Then you have the original article. The one who showed up in 'Frisco as Juan Fernandez must be the left-handed twin." The executive wrinkled his forehead. "There's also the possibility that the bill in Mexico came from this left-handed Juan Fernandez. He'd have to be in for a cut of the dough, even though he's not strictly human—"

**H**E STOPPED suddenly, looking at Jones. The secret service man only smiled.

"Don't mind," he said. "My wife and I are both used to cracks like that. But I do think you're pushing the line of deduction pretty hard here. We don't know there was a Juan Fernandez in San Francisco, either Perez or his duplicate. — And there isn't anything about the report of the arrival of the express rocket to indicate that there was any hocus-pocus at that end. In fact, it's hard to fit Perez into the picture at all, even though it does look as though Warburton duplicated him, and the time since the disappearance



at the Braunholzer Institute is just about right for training the duplicate. All we have along that line is this shipment of the box. Warburton may have worked some kind of sleight-of-hand so the box held the money instead of the bag, though at the moment I don't just see how. Everything seems to come back to him."

Howard made a note. "And he's missing. Anybody got any ideas on turning him up?"

Jones rubbed his chin. "If we're right, and it's an arranged disappearance, it's going to be hard," he said. "I think there's one possibility, though. This whole thing shows long and careful planning; it was a year and a half ago that the business at the institute took place, and there must have been a planning stage even before that. To my mind, this means that Warburton must have been arranging a duplicate identity he could slip into at least that long ago. Right?"

There was a nodding of heads around the desk.

"Well," Jones went on, "then we have to put ourselves in his mind, and figure out how he would lose himself. I think anyone smart enough to have worked out this plan would also know there'd be a warning out for the bills, and would plan on not spending any of them for a long time."

"Seems plausible," said Howard.

"In fact, his visit to Perez looks as though he somehow got wind of the fact that Perez was spending some of the money, and he was trying to put a stop to it. But the main point is that he'd have to hide out some place where he could earn enough money to live on. Now, he's got two professions—bank clerk and electronic chemist. But banks check pretty closely on their employees. Chemical firms pay more, too. So I think we'll find him quietly working at some chemical plant, where he began building up an identity for himself a while back."

Howard said, "It would have to be

fairly near here for him to have come calling on Perez. That narrows the field down considerably. You'd suggest covering the chemical firms?"

"I think there's an easier way than that. The American Chemical Society keeps a register of chemists at the research level because special jobs sometimes turn up. They can tell us what firms have hired an electronic chemist recently."

Howard shook his head. "I don't like it very well. These big industrial firms will do anything rather than produce their personnel records, and if we raid one of them and it turns out we've grabbed the wrong man, we'd be in a hell of a jam on both personal privacy and personal security."

"Won't do any harm to find out what we can, will it?" asked Swigart. "Let me try this society."

"Go ahead," said Howard. "It's about all we can do for the present about locating Warburton. Now let's take up the Di Paduano angle. How did your job of roping come out, Dewey?"

O'NEILL, who had been sitting silently, spread his hands. "Not a tumble. I picked up this guy Christy, we went to a bar together and then to a leg-show, and I gave him the old song and dance about how there'd be some dough in it if we could turn up Warburton. Hell, I might as well have been talking to one of them stone lions out front. It wasn't that he was clamming up, he just didn't know from nothing."

Jones said, "I think I can give you something on the Di Paduano angle."

"The hell you can!" said O'Neill. "What have you got that we ain't got on that?"

Jones told them about his deduction while sitting on the steps at 78th Street, waiting for Perez. "So it seems to me," he finished, "that the Owl must be working for Di Paduano. That would explain the dough behind the Owl. Or for someone connected with Di Pad-

uano, who would answer to the description of 'some babe.' All we have to do is find the babe."

"Think you're smart, don't you?" said O'Neill, with a grin. "Well, here's one for you. I found her for you."

"What?"

O'Neill waved a hand. "I been hanging around that bank, see? Yesterday noon when I'm meeting my contact, out comes this dame built like a fire-engine; you know, the kind that has them chemical knobs out front. I looked at her long enough to classify her walk in case it might come in handy some time. I said to my contact how would he like to swap jobs so I could have something like that around when I got to feeling low. He says that ain't for me, that's the boss's daughter, Dolly Di Paduano."

There was a momentary silence. Then Jones said, "That would explain a lot, all right. One of our inconsistencies has been that Di Paduano, who stands to lose by the robbery, has been so uncooperative about trying to find Warburton. But if his daughter is mixed up with the guy—"

Howard nodded. "I agree. It could be that the two Di Paduanos are afraid that Warburton is mixed up in the robbery, but aren't sure and don't want to take any action until they find out. Or it could be they're afraid that Warburton innocently let loose some tip that made the robbery possible. Hell, it could be any kind of a hookup, but one thing's sure. We know how the Owl found out about the bills on Seventy-eighth Street even before we did. Di Paduano must have tipped them off."

O'Neill said, "Okay, we got it. What next?"

"I think the next thing is to make assignments," said Howard. "Swigart will try to trace Warburton through his connections. Dewey, better take Seventy-eighth Street; you haven't been seen there, and you can pick up any leads floating around about Warburton and Perez, especially about the getaway

during the raid. George, I'm afraid I'll have to send you to 'Frisco. I'm not in the least satisfied with that Juan Fernandez angle." He looked at the three of them. "However, you can take the night plane and be comfortable. Somebody's got to see this Di Paduano girl, and since you're the Chesterfield of this bunch, I guess you're nominated."

## VII

THE VOICE said Miss Di Paduano was not at home, but the visi-plate didn't go on, and Jones had enough experience with society people to be perfectly well aware that this meant she wasn't at home unless you could prove you weren't going to ask her embarrassing questions.

It would have to be a campaign, then. He wished he had Angela with him as he got into a taxi; having a wife who looked like a tri-di star was a great help when you wanted to get into some place under guise of making a social call. But the idea he needed still hadn't jelled when the cab wheeled to a stop where the East 30s meet the river behind a screen of African hedge intended to give the occupants of the monolithic buildings beyond the illusion that they were living in a park. The Di Paduano house would be the third one down, one of the detached units. They could afford to pay for privacy.

Jones paid off his taxi and turned toward it, deciding he would have to depend upon the inspiration of the moment. The number woven into the ornamental iron gate was 16; as he clicked it open and started up the path toward the monolith—

"Where y' going, Mac?"

Jones turned to face a man who had just stepped out of a watchman's kiosk inside the hedge, and in the same moment recognized the man as one of the pair who had tried to drag him up 78th Street the previous night. In a flash so swift that it had not time to be a conscious thought, inspiration reached him.

"Going to give you a present," he said, and brought his left up from the waist.

It was no knockout. The Owl man staggered, snarled, and countered with a left of his own that showed he had had some boxing training. Not enough, though. Jones slipped the punch, crossed a right over it, and followed up with another terrific left to the pit of the stomach. The Owl man gave a grunt and sank to his knees. Before he could recover, Jones had a hammerlock on him and was whipping out a snake-wire to lock his wrists in position behind his back.

The man said thickly, "I'll put a personal security rap on you for this, you lousy Fed."

"Come along and get your lollipop," said Jones, jerking him into the kiosk. There was a phone in there, and a chair; he would have to take a chance on the Owl man's reaching the instrument somehow, but at least he could make it pretty difficult. A jerk brought the private eye into the chair; a couple more turns of snake-wire had him fixed firmly to its legs.

The Owl man said balefully, "You won't make it. I gotta give them the office from here."

"I'll take a chance on that," said Jones. He swung the door of the kiosk shut and started toward the house, hoping that the little encounter hadn't been seen. He hoped the Owl man had just been trying to upset him with the story about notice from the gate being needed to get in.

The building was one of those with a blank lower story, door set flush into the wall, and visi-plate flush into the door. When he pushed the bell the voice that answered was cold enough to have formed ice on the East River.

"Yes?"

"I'm from the Owl," said Jones, and rapidly flashed his identification past the plate, his hand held partly over it so she wouldn't see the "U.S."

"I'm afraid I can't—no, wait. Come

in," said the voice, and the door swung open on an entry with a long-haired carpet and indirect lighting. The voice said, "On the left, please."

Jones went down the hall to where thick dark curtains hung on a door on the left. They parted at the bidding of an electric eye, and he found himself looking down into a sunken living-room which had been transformed into an Italian garden by the use of modeling in the recessed walls. The lighting had been arranged for that of a serene twilight. Out of the center of it, a voice that seemed to have the same quality as the light said, "Please sit down."

**DOLLY DI PADUANÒ** was not tall, but even in the low chair behind the low table, her dark face had a regal quality that seemed to make a crown of the mass of black hair. Jones felt awkward as he came down the two steps, crossed the room and took the chair opposite hers.

He said, "They sent me up from the office. One of our people has been pinched for obstructing an officer while doing his duty."

She remained as cool as before. "I am sorry to hear it, but I don't see why I should be concerned. Your people should be more careful."

Jones leaned forward. "Yeah, but he got there for helping your friend Warburton make a getaway. The boss thought that maybe your father could tell someone to have them lay off. It's the Feds."

She gave him a long level look. Then, without stirring from her position or losing her poise, she said, "You're not from the Owl. Who are you?"

Jones grinned, and abruptly changed his manner. He said, "My name is Jones, and I'm from the U.S. Secret Service." He flashed his identification again, visibly this time. "Frankly, we're very anxious to find Warburton and ask him a few questions, and we thought you might be able to help us."

"I see. You haven't any charge

against Mr. Warburton." It was a statement, not a question.

"Not now, but he's disappeared, and there are several things we'd like to have him explain—including his connection with a man named Perez, who has been spending some of the money stolen from an express rocket."

"But that's assuming—" Her gaze shifted suddenly past his head and her tone of voice changed. "Look, why not have a drink with me, and talk this out?"

"I—"

"Please do." She leaned forward and touched his arm with a gesture of surprising warmth. "It won't take a minute." She was on her feet and through the curtain at the side of the room before he could stop her, and from behind it he heard a few words and the tinkle of glass.

In a moment she was back, in her manner a graciousness that contrasted strangely with the way she had received him. "Look," she said, "I do know Wesley Warburton quite well, but it's silly to think that he would have anything to do with a robbery. It's just that he — You can put the tray on the table."

Jones glanced up to see a man approaching with the sedate gait of a butler, carrying a tray with a shaker and glasses. There was something—

"He's had some family troubles," said the girl, "and there are times when all of us want to get away from our families. I have myself . . . This is a specialty of the house. I mix them with dry ice."

She moved the shaker and poured as Jones watched the plume of carbon dioxide come from the mouth of the shaker. He reached for one of the glasses as she took the other, and sipped at the drink. He opened his mouth to say something when his fingers suddenly went dead and the glass slipped, spilling its remaining contents on the floor. He was caught in a frightful paralysis, and he realized that it hadn't been carbon dioxide in that drink, but paraethyl triazine.

She had it, too. Across the table, her head was still a trifle lowered to one side, as though she had tried to avoid the impact of the paralyzing gas when it hit her. Her fingers were still locked around the stem of the cocktail glass from which she had never intended to drink. And as Jones stared, mouth half open for the remark that had never been uttered, he remembered what it was he had noticed about the butler. It was something just a trifle unnatural about the features, invisible unless one looked for it carefully, that showed he was wearing a plastic mask.

Warburton—and it wasn't much comfort to sit there and figure out that his walk analyzed as a type JM 22-16-8.

A SMALL SNIFF of paraethyl triazine paralyzes the motor nerves for a good four hours. Long before it was over, Jones heard the phone ring insistently, then the clickover as a record was made; and then the doorbell began. If he could have smiled he would; a relief man had evidently come to replace the one he had left trussed at the gate and was trying to pass the word. Jones wondered if there weren't any servants in the house to find them, and decided there probably weren't; if the girl had Warburton in the place, she had probably arranged for them to be out. There was nothing to do but wait for the stuff to wear off. As the phone rang again, Jones settled himself philosophically to calculate the prime numbers as far as he could do it in his head.

The girl began to move first, unclasping her fingers from around the glass. Jones hoped she wouldn't make it soon enough to get away on him, but at the same moment, his jaws came together with a snap, aching; and then life began to flow from the center of him, out to the numbed extremities. As Dolly Di Paduano sank back in her chair, he stood up and produced his gun.

"Lady," he said, "I want you to get up and get away from that thing. I think it's mostly evaporated, but I'm not

going to take any chances, because you and I are going to have a little talk."

"If you wish," she said, and stood up with cat-like grace. The cold mood was back. "May I get the records from the phone?"

"No," said Jones. "I'll get them myself later. Come over here."

He kept her in front of him until they had seated themselves in another corner of the Italian garden. Then he said, "I could arrest you, and I probably will. But you can save yourself a lot of trouble by telling me a few things. That was Warburton, wasn't it?"

"I haven't anything to say."

"All right, that wraps it up. You're under arrest."

SHE stood up indifferently and held out her hands as though expecting the snake-wire to be put on them. The door clicked, and Di Paduano came into the room. "Dolly!" he said. "Why didn't you answer? What's this?"

He was looking at Jones's gun. "This," said the Secret Service man, "is an arrest. Your daughter has just aided the escape of a suspected criminal by dosing me with paraethyl triazine."

The banker's face flushed. "If you think you can invade a private home like this—" he began, but his daughter took three quick steps to him and laid a hand on his arm.

"Don't, Father," she said. "It's true. I did it, and I'm glad I did it."

The banker put an arm around her, but he addressed Jones. "I think that we had better have a talk," he said. "Please sit down."

The perpetual twilight of the Italian garden was close around them. Di Paduano turned to Dolly. "Why did you do it?" he asked.

Two little red spots came into her cheeks, but her head was still held high. "Because I love him. Because he's my lover. You might as well know it right now; he spent the night here."

Jones said, "Warburton?"

"Yes. Wesley Warburton."

Di Paduano said, "I think you had better tell us about it, dear."

Her hands came up to her face. "I've been so afraid, and I didn't like that Perez, and—"

Jones interrupted, "Perez is in jail. He was spending some of the money from the rocket shipment. And we know he and Warburton both came from Lubbock."

Dolly said, "I know. He told me. But he wouldn't stop seeing Perez. He said Perez needed him, and it was just prejudice to be down on a man, and not fair, because he'd been in the mines for something he really didn't do at all."

"Mmmm," said Jones. "It seems to me that the record shows Perez was fairly guilty."

"I know," said the girl again. "But it was just like that business Wesley himself went through, about the heli."

"I don't know about that," said Jones.

"Oh, it was a long time ago, but Wesley told me, perfectly frankly, soon after we first met. One of the boys stole a heli and took some of the others for a ride and smashed it up. And it really wasn't fair; Wesley didn't know the heli belonged to someone else, but they sent him with all the others to be psych. It was so unfair that he resisted the psych, and then they sent him to a social development school. Before he got out his parents died, and he couldn't go to college."

"I see," said Jones. The picture was becoming clearer in his mind—Wesley Warburton, embittered by what he considered the unjust treatment he had received from the government, determined to make the government pay him for it. Keeping in touch with Perez, the expert in armed robbery. Working out a plan over months and even years. Using his connection with Dolly Di Paduano. Jones decided he didn't like Warburton, a cold-blooded and rather repulsive character.

"Why did you help him to get away this morning? I only wanted to ask him some questions," he said.

"But that was just the point! As soon as he saw you here, he knew that you'd probably hold him for questioning. He couldn't afford that. He said there was something so dreadful going on that a lot of people would suffer and maybe die, if he were even kept overnight, and he was the only one who could prevent it. I think it was because of Perez. Wesley had some influence over him, and was going to prevent his doing something. So he put that—that stuff in the cocktail shaker. He said it wouldn't hurt either of us, and it would give him a chance to prevent what Perez was going to do."

Thinking to himself that a woman in love will believe anything, Jones said, "Perez isn't going to do anything but count bars for a while." He swung to Di Paduano. "Did you know about all this?"

The banker looked lofty. "If you wish a statement for the record, I shall have to consult my lawyer."

"Damn it!" cried Jones. "If you want to play it that way, go call him up. In the meanwhile, I'm placing your daughter under arrest and taking her down to be questioned under the lights. I've got a charge of obstructing an officer against her, and I'll make it stick."

Di Paduano looked as though someone had asked him for a loan. "I resent your methods," he said, "and I shall make a complaint against them in due course. However, to avoid unpleasantness, I will tell you that when my daughter informed me that her fiancé was missing from both his home and the place where he was supposed to be employed, I retained the Owl agency to find him, with instructions to report to her. She seemed apprehensive over something this Perez person might do."

"Never occurred to you to ask the police, did it?" said Jones. "I suppose it was one of the Owl men who brought Warburton here last night?"

The girl nodded. "I told the Owl men about Wesley's knowing Perez when they first came, and they've been look-

ing for him. They phoned me yesterday morning that they had found Perez, and then last night, Wesley went to see him. But the police raided the place, and Wesley had to go, so the Owl detective brought him here."

Then Di Paduano hadn't tipped the Owl off about the money. Jones grinned inwardly at the thought that he had reached the right result by the wrong deduction. He stood up and stepped over to the table. "Do you have a piece of flex plastic?" he said. "I'm going to take this tray with me."

"But why?" said the girl.

"Warburton handled it. I saw him. I'd like to have some record of his prints."

Dolly's face tightened a little, and Di Paduano said, "I don't think that carved silver will give you any recognizable prints."

"Don't want fingerprints. They're all right for you commercial people, but in police work we haven't used anything but pore prints for about fifteen years now. The pattern's just as specific for every individual, and you don't need a whole set, just a small section from almost any part of the body. But you have to have molecular dust and a micro-camera to bring them out."

## VIII

**G**EORGE JONES had to live through a good deal of kidding about being caught by paraethyl triazine. But he arranged for Warburton's pore prints and walk-description to be added to the dossier on him, and a lookout to be set for him, as wanted for questioning. There wasn't any basis for a charge against the elusive chemist as yet, so a general arrest warning couldn't be put out. Then he arranged for a tap to be put on Di Paduano's wire, and a tail on his daughter; that would make the banker sore, but he was sore already, so it didn't matter.

By that time, Dewey O'Neill was back with a report that he hadn't been

able to pick up the Warburton trail on 78th Street, but that during the day before he was arrested, Perez had called in an expressman and shipped away a big trunk or box. Under personal privacy the express company declined to say, without a court's warrant, where he had shipped it. Howard would apply for one in the morning on the grounds that the trunk might have contained some of the missing money, but the prospects didn't look too good.

The night plane took only five hours to make the trip, but thank God, they let you sleep aboard until you were ready to get up. Jones stepped out onto the concrete of Oakland airport on a morning milky with fog, and asked for a heli taxi to take him to the landing ground of the rocket express, in the hills at San Ramon. There was a delay and a phone call to make sure that no rocket was due to take off or land immediately; contact with one would be bad for the heli taxi.

At the port itself, a busy official named Baker was glad that the government wasn't giving up on the rocket robbery. Of course, insurance covered most of the loss; "but you understand, Mr. Jones, it isn't the loss itself that disturbs us, half as much as how it took place. The success of our enterprise is built, in a sense, on the fact that we give absolute security to all shipments. Once anything is sealed in the rocket, it can't possibly be tampered with until it has been receipted for at the terminal. But now it has been tampered with. Speaking as an individual, I'd be willing to pay the three million to anyone who can tell us how it was done."

"Make me an offer," said Jones. "In the meanwhile, I suppose that all your people have been over this a dozen times, but I'd like to see the people who handled the shipments when the June sixth rocket arrived—not those who were to get the money, that's all been gone into, but those who handled the other shipments on the same rocket. Also, I'd like to know how the ship-

ments are handled."

"That's easy enough," said Baker, and snapped up the screen from the wall. "See that hill over there, the one that looks as though something had been sliding down it? Well, something has; that's where the rockets came in. The main radar station at Grand Island, Nebraska, picks them up at Brennschluss, coaches them along to the stations at Nephi and Ely and then the homing station brings them in on this hillside. There isn't a chance of substituting another rocket for the one that starts out. You'd have to have powerful radar stations and a landing somewhere, and our own stations would register the difference in flight."

"I wasn't thinking of that," said Jones. "What I want to see is what happens to the shipments after the rocket is opened."

"I'm coming to that. The rockets come down the hill against a baffle which you can't see from here. We always have a truck with a crane waiting, because some of the shipments are pretty heavy. When there's a particularly valuable shipment aboard, there may be someone waiting to sign for it the moment the rocket is opened. If there isn't, the work crew puts everything into the truck and takes it to the warehouse building, back of this one. Everything has to be logged and registered before being delivered. But the bank people—"

"I'm not interested in the shipment for the moment," said Jones. "I'd like to talk to the crew that handles the log of deliveries."

"All right," said Baker, "let's go around. You don't mind walking?"

**H**E LED the way out of the office to a low building with a crane and loading platform at one end and a heli ramp and another loading platform at the other. Inside the loading platform was an office, where Baker introduced a muscular checker named Hinrich, and explained that Jones wanted to look at the records for the day of the robbery.

"It may have been the rocket before or after the one that was robbed," said Jones, and produced the receipt for the shipment to Juan Fernandez. "I'd like to know who signed for this when it was delivered."

"AG-11-87-63," Hinrich read off, "That would be on the rocket that was hijacked, all right. I'll see." He snapped open the case containing the records, and began to turn the microfilm. "Here she is—signed for by the addressee. Came for it in person. No delivery."

"Remember anything about it?" asked Jones.

"No-o-o," said Hinrich, gazing at the record. "Wait a minute, though, that was that special handling parcel. Yes, I do remember now. We were supposed to deliver it, but he came for it instead. Sure I remember. He came in here while all the yak was going on about the money and put up a stink because he couldn't get his parcel right away."

"What did he look like?" asked Jones. "Would this be a picture of him?" He handed the checker identification photos of Perez.

Hinrich turned them around slowly, frowning as he gazed at the three-dimensional images. "No, this don't look anything like him. I never seen this guy before."

"You couldn't be mistaken?"

"Mister, I certainly couldn't. There was so much going on that day that I remember practically everything, even what I had for lunch. This picture here looks like a real Mexican, see? But this Juan Fernandez that came for the parcel looked about as much like a Mexican as the King of Sweden. He was one of them lemon blonds, about middle size, and I remember wondering where he got the Mex name."

With a shock Jones realized that the description, while it eliminated Perez, or his double, was a pretty good picture of Warburton.

He said, "Do you remember whether he was left-handed?"

"I wouldn't fool you, mister. That I

never noticed." Hinrich shrugged.

"All right, what about the parcel? What was it like?"

Hinrich closed his eyes, frowning, and then said, "I ain't a hundred per cent on this, but I think it was a big thing, sort of like a coffin, but without any handles. Sorry I can't remember no better, but we handle a lot of parcels."

"You're doing all right. How did it happen you turned it over to him? Can anyone just walk in here and pick up a parcel that's supposed to be delivered?"

Baker said, "We're very careful—" and Hinrich, "I should say not! When a parcel is claimed here, instead of being delivered, we make them put up enough identification to get past St. Peter into Heaven. I don't remember what this guy had, but it must of been plenty good."

"The shipping address is two-four-oh-three Noriega Street. Would your identification go far enough to make certain he actually lived at that address?"

"With a name like Juan Fernandez? Don't make me laugh; half the Mexicans in California are named like that. I say I don't remember how I tied it up to the same guy, but I bet I did."

It occurred to Jones that some of this vehemence was for the benefit of the boss, but that didn't make any particular difference. It seemed fairly clear that Warburton had taken delivery on the box and that Perez had shipped it; but why?

Could it be that the money had been transferred from bag to box by some impossible system of teleportation? His mind played wildly with the thought as he took leave of Baker and got into a heli taxi for San Francisco. The next step was clear enough; it was to go to 2403 Noriega Street, where the police inquiry had been limited to establishing that no one named Juan Fernandez lived there. He wished he had a picture of Warburton, but the missing chemist had evidently taken particular care that there shouldn't be any. On the way to



Noriega, it occurred to him to send a message to Washington to have government physiologists asked whether it was possible, by any system of bracings or injections, to protect a human body against an acceleration of 8g, and to have the same question put into an integrator. He took care of that detail first.

**T**HE PLACE on Noriega turned out to be one of the featureless identical houses on the identical streets surrounding the Sunset Reservoir; a boarding house, by its appearance. The proprietor was a thin man with lustreless eyes, who had apparently let all his energy run out into the enormous mustache that flowed across his face. Nope, he didn't mind answering a couple questions. Nope, nobody named Juan Fernandez ever lived there; the police had asked him that before. Nope, no one got mail there under that name.

Jones tried a description of Warburton, or as much of one as he could give. The boarding-house keeper put his head on one side. "Oh, him. Yeah, I remember him. Only stayed a short while. Then the other fellow came, and he left. Name of Wharton, or something like that."

"Would it be Warburton?"

"That's it. Funny thing about him. He had dinner sent up to his room, and he ate enough for four people, I'm telling you. Then this other fellow came, and they were yelling at each other up in the room, and the next day he was gone. Left some kind of trunk behind him, too."

Jones produced the pictures of Perez again. "Would this be the other fellow?"

The man let his jaw drop open as he gazed. "Can't say for sure," he finally decided.

"All right. Have you still got that trunk he left behind? And can I see it?"

"I guess so."

The thin man solemnly led the way to a basement where an old-fashioned bulb light shed insufficient radiance on piles of junk, in the midst of which was

an object that could equally well have borne the description of a trunk or a coffin—an oblong box, about three feet high, two and a half feet wide, and five feet long. There was a lock, broken; the lifted lid showed an interior lined with asbestos cloth over some kind of padding, through which projected a series of paired metal rings.

Jones gazed at it blankly, unable even to guess the purpose of this singular container. But that hardly mattered beside the fact that, after he had borrowed a molecular dust insufflator from the nearest police station, the microphotos of the lining showed that it bore the pore-prints; not only of Warburton, but also of Jesus Perez.

## IX

**O**UR CHIEF," said Jones, "always has us looking for contradictions—facts that will only add up to an impossibility. He says that a case in which there aren't any can be handled by an integrator, and the only reason for having a human detective on the job is that he can resolve problems where the machine would reject all proposals as having zero probability."

Case Executive Howard said, "And we have some contradictions here." It was a statement.

Jones said: "We don't have anything else. Perez couldn't have been in San Francisco at the time of the robbery, but the case is full of his pore-prints."

"That ain't no contradiction," said Dewey O'Neill. "He shipped the case, didn't he? He could of got the prints in there when he packed it, if he didn't travel in it himself."

"No, he couldn't do that," said Jones. "The box is too short, or too low, to hold a man. And the money couldn't have moved from the bag to the box during flight, but I'm convinced that's what happened, somehow. And we expect to find Perez, or his duplicate, using the name of Juan Fernandez; but it's Warburton who uses the name."

"There's still another one," said Howard. "The reply to that request you sent Washington is back. The physiologists say it's absolutely impossible to rig up a man so he can stand 8g, and the integrator calculates the possibility at point oh-two per cent, which is a little less than nothing."

"I didn't expect much from that, anyway," said Jones. "But there's one other thing. That boarding-house keeper in Frisco couldn't identify Perez as the man who called on Warburton there and quarrelled with him, because he didn't see who it was. I think it must have been, though, and I suggest that we ask little Jesus, not for his alibi for the date of the robbery, but for the following week."

Howard frowned. "We can do that, but I want to point out that clearing up these back details of the case gets us exactly nowhere. What we need now is a foolproof method of finding Warburton. And we haven't even got a description of him."

"We have his walk," Jones pointed out. "I saw it myself. And we have the fact that he is almost certainly living somewhere under the name of Juan Fernandez. The identification he showed to get the box at San Ramon was good enough so that he must have spent some time building it up."

"That doesn't do us much good right now. We can't very well put out a nationwide alarm for all persons named Juan Fernandez, or for all those with JM 22-16-8 walks, either." He swung to Swigart. "What did you get on the lists of people who have hired electronic chemists recently?"

The city man made a face. "My contact got a list all right, but it's got about twenty names on it, and they're scattered across the country from hell to breakfast. And you know how those companies are; the minute you want a crack at their personnel records, they start yelling 'personal privacy' and 'industrial espionage' at you. Here's the list."

Howard took it. "It isn't much," he said, "but it's the best thing we have, and maybe we can parlay it into cracking the case. I see a line; each of you take one of these places and plant himself outside before they open up in the morning. Keep looking for someone going in with a JM 22=16=8 walk, until you're satisfied he's either there or he isn't. I wouldn't lay too much stress on Warburton's blondness; it's so distinctive that he'll probably have his hair done over, and I wouldn't be surprised to find that's why he took the name of Fernandez. Jones, I think you draw the first name—that's Seawater Chemical, of Portsmouth, New Hampshire."

THE PHONE rang.

"Who is it?" said Howard.

"Mr. Di Paduano calling," came the operator's brassy voice, and the next moment the banker's face flashed on the screen, distorted with emotion.

"My daughter's gone!" he said. "She's gone to join him!"

"Who—Warburton?" asked Howard.

"Yes. She left a note, saying that she had to make the choice some time, and had decided to make it now; and that though she might be unhappy with him, she'd be more so if she didn't follow her impulse."

"Do you want us to find her?" asked Howard.

"Yes."

"I am making that a matter of record."

"Go ahead. You have my permission. I don't want her disturbed; I just want to know that she's safe."

Jones said, "Can I get in the act for just a minute?" and as Howard motioned to him, took his place at the screen.

"Mr. Di Paduano," he said, "do you have anything to indicate where your daughter might have gone?"

"Not a thing," said the banker. "When I came home for lunch, she was simply gone, and left this note."

"None of the servants saw her go?"

"We're mostly automatics and have only a butler and a cook at the town house."

"Did she take your car or heli?"

"No, neither one: not even her own car."

Jones said, "I think it would be a good idea if you checked up on what clothes are missing. We'll do our best for you. Also, we'll send somebody down to get any tri-dis or photos of her you can spare. Good-by."

As the banker's picture faded, he turned to the others. "It worked," he said. "Where's that list that Swigart got? Here, Howard, see? Chasing around to all those firms isn't going to be necessary; the place where Warburton is hiding out is right across the river at the Fairfield Reducing Company in Bayonne, New Jersey."

Swigart said, "How do you know?"

"Because I set this up by leaving a hole for it. When I came to from the paraethyl triazine, and began questioning that wench, she started out by being just as tight as the skin on an apple, and even proud of helping Warburton make his getaway. Then her father came in, and she got very co-operative. It was one of those contradictions I've been talking about. And the more she told her story about believing in Warburton's innocence, the less convincing it became. I began by thinking that he was putting one over on her; but the farther along I got, the more I began to see that she was putting one over on me. So I left her a couple of easy outs. I kept from asking whether she knew where Warburton was, or raising any discussion about him; to keep her papa from getting suspicious. I was pretty sure when she opened up that much, but held out the details, that she'd go right to him and lead us that way."

Howard said, "Good psychology. You Secret Service boys work it hard, don't you? But what makes you think of Bayonne?"

"The layout of that place of Di Paduano's," said Jones. "Look, she didn't

take the car or the heli. We haven't any report from the tail that was sitting on the gate for her, so she didn't take a taxi and the normal exit. But I've cased the joint. If you walk a block and a half north along the river front, you come to the foot of Forty-second Street, and there's a water-scooter service there. I'll bet you the three million dollars against a piece of cheesecake that she took a waterscooter and went to Bayonne. It's the only place on Swigart's list she could reach that way."

Howard said, "No, it isn't. She could have gone to an airport, or anywhere."

"Nothing doing. The place where she's gone has to meet two requirements. Remember it has to be a place where Warburton could live a double life, establishing an identity as Juan Fernández while operating in New York. So he had to get back and forth quickly. And now we know in addition that it has to be a place that can be reached by water from New York."

Howard gave him one glance, then picked up the phone and pushed a button. "Hello, Assignments?" he said. "Have someone get in touch with the man covering the fate of the Di Paduano house—I think it's Reichert. Tell him to go up to the house, get a photo of Dolly Di Paduano, which her father will give him, and take it to the water-scooter service at the foot of Forty-second Street. I want to know if she rented one this morning."

He turned to the others. "I don't think, with a bird who moves as fast as Warburton, it will pay to delay." He pressed another button. "Traffic? I want a heli with full raiding equipment prepared immediately. Four-place job. And put down a checkout for me on a raid to the Fairfield Reducing Company, in Bayonne, accompanied by O'Neill, Jones of Secret Service, and New York Detective Swigart."

**T**HE Fairfield Reducing Company sprawled, but sprawled with a certain grace, across what had once been

part of the Jersey flats, its low work-buildings facing the apartments for the executives across a wide heli landing platform. The receptionist was cool, and the big man in the office laid down his dicto-typo with an annoyed air as the four filed into his office. "What can I do for you, gentlemen?" he asked.

Howard flashed his identity. "We would like to ask a few questions about an electronic chemist you hired, probably in June."

"Our personnel records are closed."

Jones leaned forward. "We think his name is Juan Fernandez."

"Oh." The big man contemplated him for a moment.

Howard seized the opportunity. "Then he does work here! In that case, we won't bother you with any questions that might violate personal privacy. We just want to talk to him."

The big man favored them with another look, touched the intercom, and said, "If Mr. Fernandez isn't running an experiment, will you ask him to step into the office for a moment?"

They could all hear the voice at the other end of the line saying, "Mr. Fernandez got a phone call about an hour and a half ago, and said he was going to step over to his apartment. He hasn't come back yet."

"Where's the apartment?" asked Howard.

The big man said, "It's Number Six of those semi-detached buildings across the field. I hope you don't intend—"

"Haven't got time to discuss it," said Howard. "Come on, gang."

The buildings were in the so-called Brazilian style with aerated roofs that had come in about fifteen years before. Howard dispatched O'Neill and Swigart to cover the back and himself stepped under the overhang and up to the visiplate—which would have looked very strange on a real Brazilian house—to press the button.

There wasn't any answer.

Howard pressed again. There still wasn't any answer.

Jones said, "Damnit! If that slippery bastard has got away from us again, I'll turn in my badge."

Howard said, "I hope it hasn't got an electric guard, but I'll have to take the chance. Stand back." He produced his needle-gun, twisted it open, dropped the charges in his pocket, replaced them with a shaped-charge cartridge, stepped back a little, knelt to get on a level with the lock, and fired. There was a burst of flame and a *boom!* The door slammed open.

Jones whipped out his gas-gun and, Howard by his side, made for the aperture. There wasn't any light, but as soon as they had fumbled one on, they realized that their long search for Wesley Eustace Warburton was probably over, but it wasn't going to do them much good. The man who lay with his face pressed into the rubber-plastic floor covering was quite dead, the whole back of his head bashed in.

"He has dark hair," observed Jones, with mild interest, "but I'll bet it isn't permanent."

"Looks like you were right about the Di Paduano wench being tougher than she looks," said Howard. "Go through and let in O'Neill and Swigart, will you? I'm going back to the heli for dust and a camera."

Jones started down the hall to where three doors offered him a choice of routes. The one in the center was a closet; but that on the right led into a tiny dining-room with a gleaming kitchen beyond, and as soon as Jones opened it, he was aware that Dolly Di Paduano hadn't been so tough after all. She was lying in the kitchen, her head against a partly opened packing box which was leaking insulation, and she was quite as dead as Warburton, though not so messily.

Jones stepped to the door, noted that it was locked on the inside, and called to the other two. O'Neill whistled when he saw the body. "Boy-friend did her in, huh?" he said. "Looks like a wind-pipe job."

"I would say so, yes," said Jones: "But it wasn't the boy-friend. He's in the front hall with a hole in his head. Get your guns ready. The doors were locked, so whoever did it must still be in the building. I'll take the lead. You cover me, Dewey, and Swigart come about three steps back."

**H**E STEPPED to the pantry and freezing-closet off the kitchen and flung it open. It was empty. So was the bedroom that had a separate entrance to the pantry. And the bathroom. And the closets. And the living room.

Dewey O'Neill pushed back his hat as they watched Howard taking micro-photos of the area around the dead man. "I can't say I'm not relieved," he said. "I never did like gunfights anyway. But what the hell!"

"Must of got out a window," said Swigart, dusting away. "I think I'll put dust on them and see what we get."

"But why should he?" demanded Jones: "When there were perfectly good doors, and the windows only give on those alleys between the buildings. You'd think anyone in his right mind wouldn't want to take a chance on being seen getting out of a window."

"That ain't all," said O'Neill. "Who the hell done it? They couldn't of killed each other. This case is nuts."

Howard, pulling the rapidly developed prints from the back of the camera, said, "Those on the inside door-handle are Warburton's. Same as the ones on that silver tray you got, George."

"Yeah," said Swigart. "I got a look at the roots of his hair while I was dusting. They're blond. How long would you say he'd been gone?"

"Not over an hour and a half."

"That's about what I made it. Someone must have been waiting behind the door popped him as soon as he came over here he got that phone call."

Jones said, "Then get the button on the phone. It seems to me that whoever did it had probably already knocked

Miss Paduano off, and the phone call was a decoy to bring him over here. Only—"

"Only what?" said Howard.

"Only there aren't enough people in this case to go round. Two of them are dead, and one's in jail, and they're the only ones who knew about the robbery."

"It rates as one of those impossibilities you were talking about," said Howard. "The prints on that phone button are different from Warburton's, all right. All right, let's try the kitchen. If that poor girl was strangled, there ought to be some prints on her throat."

He led the way into the other room, followed by Swigart with the insufflator.

O'Neill said, "How we going to get the money back now?"

Jones said, "I think we'll find that Warburton has it stashed away somewhere under the name of Fernandez. He was pretty careful about leaving loose ends around. Probably a safe-deposit box. We'll turn this joint inside out after we notify the local police."

Howard's camera snapped, he reached in the back and drew out the print. "By George, Dewey," he said in a funny voice.

"What have you got?"

"There are prints on the girl's throat, all right. But I've seen them before, and so have you. Look at them. They belong to Jesus Perez."

For ten seconds there was a silence of amazed faces and dropped jaws.

Jones said, "Get back!" and raced for the other side of the room, whipping out his gas-gun, and aiming it at the corner of the packing box, where it was spilling insulation. The shell hit it with a little *whuff!*

As though it had been a signal, the whole side of the box cracked open, something about the size of a terrier emerged, poised, and as Jones yelled, "Shoot!" launched itself at Swigart's head. Swigart fired and missed it in midair. O'Neill fired twice and there was a burst of flame from inside the box as Jones flung himself on what

seemed to be a midget which was clinging with its legs around Swigart's neck and striking at him with a blackjack. The two went down across a chair with a crash. The midget was unbelievably strong; Jones could not drag it loose, but O'Neill got his gun against its head and pulled the trigger.

Swigart sat on the floor, one hand to his head, and Howard and O'Neill bent over the creature the latter had killed. About two feet high, dressed in something loosely belted around its middle, but with arms bare, it had the muscles of a vestpocket Hercules and the features of a man of about thirty.

"What is that little horror?" asked Howard.

"That," said Jones, "is one of the duplicates of Jesus Perez. There's another one half out of the box, where O'Neill shot it, and I think you'll find the third inside."

## X

**I**T WAS like this," said Jones, lifting his glass and squinting through it at the azure bar-lights of the Caverne Bleu. "The square-cube law was responsible for the whole business."

"Why don't they repeal it, then?" said O'Neill.

"That would be difficult," said Jones. "It's international. Warburton was just smart enough to figure out how to use it to do something that couldn't be done, but not smart enough to escape the consequences of what he did."

"I have a vague idea—" said Howard.

Jones sipped and raised a hand. "The square-cube law goes roughly something like this: as you increase the size, or mass, of an animal by the cube of its previous figure, its strength only goes up to the square. A man thirty feet high would be almost too weak to walk around; that is, if he had the same proportions. On the other hand very small animals, like a mouse or a marmoset, are prodigiously strong for their size, and when you get down to an ant,

it can walk around with a load of ten or twenty times its own weight. Try lifting fifteen hundred pounds some time."

"You could do it one pound at a time," said O'Neill.

"Shut up. The small ones are on the right end of the square-cube law. That's the fact Warburton used to steal the money shipment from the rocket. The first thing he needed was someone with incorrigible criminal tendencies, like Perez. He got into the Braunholzer Institute and put Perez in the reproducer; but he didn't just make another Perez. He made three, each a third of Perez' size. That reminds me, I must go up there and find out if Dick Mansfeld knows how it was worked. I'll bet it was a new technique Warburton worked out for himself."

"He isn't in a position to tell us," remarked Howard.

Jones went on, "Anyway, when Warburton got through with the reproducer, he had three two-foot Perezes on his hands, left-handed, physically powerful—did you see how that one came right across the room at Swigart in a single jump?—and with inherent criminal tendencies. It took the pair of them about a year or so to educate their midgets and locate the right money shipment. Then Perez shipped the midgets to Juan Fernandez in that box. Warburton, who had already established the identity, was on hand to meet it. The box held the three little duplicates of Perez when it started; when it arrived, it held them—plus the money. They simply climbed out and took it from the bag."

"I thought the acceleration would kill anyone," said Howard.

"The acceleration was 8g," said Jones. "It would kill a full-sized man. But the midgets gained strength by losing size. The 8g of the rocket would only affect them the way 1½g would affect us."

"Then the money was aboard the rocket all the time," said Howard. "That is, up to the time Warburton's box was taken off. But why didn't he do away

with those little nightmares?"

Jones said, "I don't know for certain, but I think Warburton did try to get rid of them in San Francisco, at the Noriega Street place. Either they got out of their box—the lock was broken—or Perez got there too quickly and prevented it. They had some kind of quarrel and left separately. I imagine they quarreled over the division of the money, too. That was what meant the end of Warburton in the long run."

"How do you mean?" said Howard.

"It's easy enough to figure out what happened. We know Warburton went to see Perez in New York—probably to get him out of the country, or make him stop spending the stolen money or something. We broke that up, but before we did, Perez must have shipped his little companions to Warburton, with instructions to do him in. It's easy enough to reconstruct what happened in that kitchen. The Di Paduano girl arrived, called Warburton at his office—those were her prints on the phone button—and then either got curious about that box, or else the little Perezes acted on their own initiative against her before taking on Warburton."

Swigart said, "What made him pick the name of Juan Fernandez?"

"That's another thing we don't know positively," said Jones, "but I rather think he didn't trust Perez much. He chose the name so that if anyone did get on the trail, they'd take it as an alias for Perez, just as we did at first. Mr.

Warburton didn't leave much to chance."

"Except his love-life," said Howard.

"Yes," agreed Jones. "Only he didn't even really leave that to chance. I imagine he was going to drop Dolly Di Paduano out of the picture until the Owl men found him by tracing him through Perez. But after the Owl man found him with Perez on Seventy-eighth Street, he was quick enough to see that if he tried to get away, he'd probably be followed. So he took the chance on going down to Di Paduano's. He found the girl surprisingly co-operative—and she paid for it with her life."

"That's what happens when you get mixed up with dames," said O'Neill, inconsequentially. "But give us the dope, old master. What tipped you off about those three guys in the box?"

"Has to be that way," said Jones. "Perez is in jail, but there were his pore-prints. If we'd been looking for fingerprints, they'd have been in reverse, but the pore pattern is symmetrical. I thought of a duplicate Perez early in the game, remember. But there didn't seem to be any trace of one. Then I remembered something else. Asbestos cloth is awfully peculiar material to use for packing; too expensive for one thing. But that box out in San Francisco was lined with it, and it was also full of Perez prints. Here we had another box with asbestos and Perez prints around. They had to be connected. And then I remembered the square-cube law."

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*and,*

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## **CHOLWELL'S CHICKENS**

*A Novelet by* JACK VANCE

*From what has already been demonstrated, you can plainly see the impossibility of increasing the size of structures to vast dimensions either in art or in nature; likewise the impossibility of building ships, palaces, or temples of enormous size in such a way that their oars, yards, beams, iron bolts, and, in short, all their other parts will hold together; nor can nature produce trees of extraordinary size because the branches would break down under their own weight, so also it would be impossible to build up the bony structures of men, horses, or other animals so as to hold together and perform their normal functions if these animals were to be increased enormously in height; for this increase in height can be accomplished only by employing a material which is harder and stronger than usual, or by enlarging the size of the bones, thus changing their shape until the form and appearance of the animals suggest a monstrosity. This is perhaps what our wise Poet had in mind, when he says, in describing a huge giant:*

*"Impossible it is to reckon his height*

*So beyond measure is his size." —GALILEO GALILEI*

## 14 On Being the Right Size

By J. B. S. HALDANE

THE most obvious differences between different animals are differences of size, but for some reason the zoologists have paid singularly little attention to them. In a large textbook of zoology before me I find no indication that the eagle is larger than the sparrow, or the hippopotamus bigger than the hare, though some grudging admissions are made in the case of the mouse and the whale. But yet it is easy to show that a hare could not be as large as a hippopotamus, or a whale as small as a herring. For every type of animal there is a most convenient size, and a large change in size inevitably carries with it a change of form.

Let us take the most obvious of possible cases, and consider a giant man sixty feet high—about the height of Giant Pope and Giant Pagan in the illustrated *Pilgrim's Progress* of my childhood. These monsters were not only ten times as high as Christian, but ten times as wide and ten times as thick, so that their total weight was a thousand times his, or about eighty to ninety tons. Unfortunately the cross sections of their bones were only a hundred times those of Christian, so that every square inch of giant bone had to support ten times the weight borne by a square inch of human bone. As the human thigh-bone breaks under about ten times the human weight, Pope and Pagan would have broken their thighs every time they took a step. This was doubtless why they were sitting down in the picture I remember. But it lessens one's respect for Christian and Jack the Giant Killer.

To turn to zoology, suppose that a gazelle, a graceful little creature with



long thin legs, is to become large, it will break its bones unless it does one of two things. It may make its legs short and thick, like the rhinoceros, so that every pound of weight has still about the same area of bone to support it. Or it can compress its body and stretch out its legs obliquely to gain stability, like the giraffe. I mention these two beasts because they happen to belong to the same order as the gazelle, and both are quite successful mechanically, being remarkably fast runners.

Gravity, a mere nuisance to Christian, was a terror to Pope, Pagan, and Despair. To the mouse and any smaller animal it presents practically no dangers. You can drop a mouse down a thousand-yard mine shaft; and, on arriving at the bottom, it gets a slight shock and walks away. A rat would probably be killed, though it can fall safely from the eleventh story of a building; a man is killed, a horse splashes. For the resistance presented to movement by the air is proportional to the surface of the moving object. Divide an animal's length, breadth, and height each by ten; its weight is reduced to a thousandth, but its surface only to a hundredth. So the resistance to falling in the case of the small animal is relatively ten times greater than the driving force.

An insect, therefore, is not afraid of gravity; it can fall without danger, and can cling to the ceiling with remarkably little trouble. It can go in for elegant and fantastic forms of support like that of the daddy-long-legs. But there is a force which is as formidable to an insect as gravitation to a mammal. This is surface tension. A man coming out of a bath carries with him a film of water of about one-fiftieth of an inch in thickness. This weighs roughly a pound. A wet mouse has to carry about its own weight of water. A wet fly has to lift many times its own weight and, as every one knows, a fly once wetted by water or any other liquid is in a very serious position indeed. An insect going for a drink is in as great danger as a man leaning out over a precipice in search of food. If it once falls into the grip of the surface tension of the water—that is to say, gets wet—it is likely to remain so until it drowns. A few insects, such as water-beetles, contrive to be unwettable, the majority keep well away from their drink by means of a long proboscis.

Of course tall land animals have other difficulties. They have to pump their blood to greater heights than a man and, therefore, require a larger blood pressure and tougher blood-vessels. A great many men die from burst arteries, especially in the brain, and this danger is presumably still greater for an elephant or a giraffe. But animals of all kinds find difficulties in size for the following reason. A typical small animal, say a microscopic worm or rotifer, has a smooth skin through which all the oxygen it requires can soak in, a straight gut with sufficient surface to absorb its food, and a simple kidney. Increase its dimensions tenfold in every direction, and its weight is increased a thousand times, so that if it is to use

its muscles as efficiently as its miniature counterpart, it will need a thousand times as much food and oxygen per day and will excrete a thousand times as much of waste products.

Now if its shape is unaltered its surface will be increased only a hundredfold, and ten times as much oxygen must enter per minute through each square millimetre of skin, ten times as much food through each square millimetre of intestine. When a limit is reached to their absorptive powers their surface has to be increased by some special device. For example, a part of the skin may be drawn out into tufts to make gills or pushed in to make lungs, thus increasing the oxygen-absorbing surface in proportion to the animal's bulk. A man, for example, has a hundred square yards of lung. Similarly, the gut, instead of being smooth and straight, becomes coiled and develops a velvety surface, and other organs increase in complication. The higher animals are not larger than the lower because they are more complicated. They are more complicated because they are larger. Just the same is true of plants. The simplest plants, such as the green algae growing in stagnant water or on the bark of trees, are mere round cells. The higher plants increase their surface by putting out leaves and roots. Comparative anatomy is largely the story of the struggle to increase surface in proportion to volume.

Some of the methods of increasing the surface are useful up to a point, but not capable of a very wide adaptation. For example, while vertebrates carry the oxygen from the gills or lungs all over the body in the blood, insects take air directly to every part of their body by tiny blind tubes called tracheae which open to the surface at many different points. Now, although by their breathing movements they can renew the air in the outer part of the tracheal system, the oxygen has to penetrate the finer branches by means of diffusion. Gases can diffuse easily through very small distances, not many times larger than the average length travelled by a gas molecule between collisions with other molecules. But when such vast journeys—from the point of view of a molecule—as a quarter of an inch have to be made, the process becomes slow. So the portions of an insect's body more than a quarter of an inch from the air would always be short of oxygen. In consequence hardly any insects are much more than half an inch thick. Land crabs are built on the same general plan as insects, but are much clumsier. Yet like ourselves they carry oxygen around in their blood, and are therefore able to grow far larger than any insects. If the insects had hit on a plan for driving air through their tissues instead of letting it soak in, they might well have become as large as lobsters, though other considerations would have prevented them from becoming as large as man.

Exactly the same difficulties attach to flying. It is an elementary principle of aeronautics that the minimum speed needed to keep an aeroplane

of a given shape in the air varies as the square root of its length. If its linear dimensions are increased four times, it must fly twice as fast. Now the power needed for the minimum speed increases more rapidly than the weight of the machine. So the larger aeroplane, which weighs sixty-four times as much as the smaller, needs one hundred and twenty-eight times its horsepower to keep up. Applying the same principles to the birds, we find that the limit to their size is soon reached. An angel whose muscles developed no more power weight for weight than those of an eagle or a pigeon would require a breast projecting for about four feet to house the muscles engaged in working its wings, while to economize in weight, its legs would have to be reduced to mere stilts. Actually a large bird such as an eagle or kite does not keep in the air mainly by moving its wings. It is generally to be seen soaring, that is to say balanced on a rising column of air. And even soaring becomes more and more difficult with increasing size. Were this not the case eagles might be as large as tigers and as formidable to man as hostile aeroplanes.

But it is time that we passed to some of the advantages of size. One of the most obvious is that it enables one to keep warm. All warm-blooded animals at rest lose the same amount of heat from a unit area of skin, for which purpose they need a food-supply proportional to their surface and not to their weight. Five thousand mice weigh as much as a man. Their combined surface and food or oxygen consumption are about seventeen times a man's. In fact a mouse eats about one quarter its own weight of food every day, which is mainly used in keeping it warm. For the same reason small animals cannot live in cold countries. In the arctic regions there are no reptiles or amphibians, and no small mammals. The smallest mammal in Spitzbergen is the fox. The small birds fly away in the winter, while the insects die, though their eggs can survive six months or more of frost. The most successful mammals are bears, seals, and walruses.

Similarly, the eye is a rather inefficient organ until it reaches a large size. The back of the human eye on which an image of the outside world is thrown, and which corresponds to the film of a camera, is composed of a mosaic of 'rods and cones' whose diameter is little more than a length of an average light wave. Each eye has about half a million, and for two objects to be distinguishable their images must fall on separate rods or cones. It is obvious that with fewer but larger rods and cones we should see less distinctly. If they were twice as broad two points would have to be twice as far apart before we could distinguish them at a given distance. But if their size were diminished and their number increased we should see no better. For it is impossible to form a definite image smaller than a wave-length of light. Hence a mouse's eye is not a small-scale model of a human eye. Its rods and cones are not much smaller than ours, and therefore there are far fewer of them. A mouse could not distinguish one

human face from another six feet away. In order that they should be of any use at all the eyes of small animals have to be much larger in proportion to their bodies than our own. Large animals on the other hand only require relatively small eyes, and those of the whale and elephant are little larger than our own.

For rather more recondite reasons the same general principle holds true of the brain. If we compare the brain-weights of a set of very similar animals such as the cat, cheetah, leopard, and tiger, we find that as we quadruple the body-weight the brain-weight is only doubled. The larger animal with proportionately larger bones can economize on brain, eyes, and certain other organs.

Such are a very few of the considerations which show that for every type of animal there is an optimum size. Yet although Galileo demonstrated the contrary more than three hundred years ago, people still believe that if a flea were as large as a man it could jump a thousand feet into the air. As a matter of fact the height to which an animal can jump is more nearly independent of its size than proportional to it. A flea can jump about two feet, a man about five. To jump a given height, if we neglect the resistance of the air, requires an expenditure of energy proportional to the jumper's weight. But if the jumping muscles form a constant fraction of the animal's body, the energy developed per ounce of muscle is independent of the size, provided it can be developed quickly enough in the small animal. As a matter of fact an insect's muscles, although they can contract more quickly than our own, appear to be less efficient; as otherwise a flea or grasshopper could rise six feet into the air.

And just as there is a best size for every animal, so the same is true for every human institution. In the Greek type of democracy all the citizens could listen to a series of orators and vote directly on questions of legislation. Hence their philosophers held that a small city was the largest possible democratic state. The English invention of representative government made a democratic nation possible, and the possibility was first realized in the United States, and later elsewhere. With the development of broadcasting it has once more become possible for every citizen to listen to the political views of representative orators, and the future may perhaps see the return of the national state to the Greek form of democracy. Even the referendum has been made possible only by the institution of daily newspapers.

To the biologist the problem of socialism appears largely as a problem of size. The extreme socialists desire to run every nation as a single business concern. I do not suppose that Henry Ford would find much difficulty in running Andorra or Luxembourg on a socialistic basis. He has already more men on his pay-roll than their population. It is conceivable

that a syndicate of Fords, if we could find them, would make Belgium Ltd. or Denmark Inc. pay their way. But while nationalization of certain industries is an obvious possibility in the largest of states, I find it no easier to picture a completely socialized British Empire or United States than an elephant turning somersaults or a hippopotamus jumping a hedge.