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Sixty Million Trillion Combinations

I love to feel ingenious. Suppose you have sixty million trillion possible combinations of letters and from that enormous number you have to choose exactly one. Can you do it?

Unfortunately, I don't remember any longer exactly how long it took me to think up the gimmick to this story, but I suspect that, like all such things, it came to me in a flash.

People ask me, "Where do you get your ideas?" A young man (an aspiring writer) called me from South Dakota last night, thinking that perhaps I had a magic formula I could give him. I said I didn't. I just thought and thought. The thing is that the thinking goes on unconsciously while I am doing other things and then, apparently out of nowhere, it comes up with something and surfaces.

Then I feel ingenious and love the story.

Since it was Thomas Trumbull who was going to act as host for the Black Widowers that month, he did not, as was his wont, arrive at the last minute, gasping for his preprandial drink.

There he was, having arrived in early dignity, conferring with Henry, that peerless waiter, on the details of the menu for the evening, and greeting each of the others as he arrived.

Mario Gonzalo, who arrived last, took off his light overcoat with care, shook it gently, as though to remove the dust of the taxicab, and hung it up in the cloakroom. He came back, rubbing his hands, and said, "There's an autumn chill in the air. I think summer's over."

"Good riddance," called out Emmanuel Rubin, from where he stood conversing with Geoffrey Avalon and James Drake.

"I'm not complaining," called back Gonzalo. Then, to Trumbull, "Hasn't your guest arrived yet?"

Trumbull said distinctly, as though tired of explaining, "I have not brought a guest."

"Oh?" said Gonzalo, blankly. There was nothing absolutely irregular about that. The rules of the Black Widowers did not require a guest, although not to have one was most unusual. "Well, I guess that's all right."

"It's more than all right," said Geoffrey Avalon, who had just drifted in their direction, gazing down from his straight-backed height of seventy-four inches. His thick graying eyebrows hunched over his eyes and he said, "At least that guarantees us one meeting in which we can talk aimlessly and relax."

Gonzalo said, "I don't know about that. I'm used to the problems that come up. I don't think any of us will feel comfortable without one. Besides, what about

Henry?”

He looked at Henry as he spoke and Henry allowed a discreet smile to cross his unlined, sixtyish face. “Please don’t be concerned, Mr. Gonzalo. It will be my pleasure to serve the meal and attend the conversation even if there is nothing of moment to puzzle us.”

“Well,” said Trumbull, scowling, his crisply waved hair startlingly white over his tanned face, “you won’t have that pleasure, Henry. I’m the one with the problem and I hope someone can solve it: you at least, Henry.”

Avalon’s lips tightened, “Now by Beelzebub’s brazen bottom, Tom, you might have given us one old-fashioned—”

Trumbull shrugged and turned away, and Roger Halsted said to Avalon in his soft voice, “What’s that Beelzebub bit? Where’d you pick that up?”

Avalon looked pleased. “Oh, well, Manny is writing some sort of adventure yarn set in Elizabeth’s England—Elizabeth I of course—and it seems—”

Rubin, having heard the magic sound of his name, approached and said, “It’s a sea story.” Halsted said, “Are you tired of mysteries?”

“It’s a mystery also,” said Rubin, his eyes flashing behind the thick lenses of his glasses. “What makes you think you can’t have a mystery angle to any kind of story?”

“In any case,” said Avalon, “Manny has one character forever swearing alliteratively and never the same twice and he needs a few more resounding oaths. Beelzebub’s brazen bottom is good, I think.”

“Or Mammon’s munificent mammaries,” said Halsted.

Trumbull said, violently, “There you are! If I don’t come up with some problem that will occupy us in worthwhile fashion and engage our Henry’s superlative mind, the whole evening would degenerate into stupid triplets—by Tutankhamen’s tin trumpet.”

“It gets you after a while,” grinned Rubin, unabashed.

“Well, get off it,” said Trumbull. “Is dinner ready, Henry?”

“Yes it is, Mr. Trumbull.”

“All right, then. If you idiots keep this alliteration up for more than two minutes, I’m walking out, host or no host.”

The table seemed empty with only six about it, and conversation seemed a bit subdued with no guest to sparkle before.

Gonzalo, who sat next to Trumbull, said, “I ought to draw a cartoon of you for our collection since you’re your own guest, so to speak.” He looked up complacently at the long list of guest-caricatures that lined the wall in rank and file. “We’re going to run out of space in a couple of years.”

“Then don’t bother with me,” said Trumbull, sourly, “and we can always make space by burning those foolish scrawls.”

“Scrawls!” Gonzalo seemed to debate within himself briefly concerning the possibility of taking offense. Then he compromised by saying, “You seem to be in a foul mood, Tom.”

“I seem so because I am. I’m in the situation of the Chaldean wise men facing Nebuchadnezzar.”

Avalon leaned over from across the table. “Are you talking about the Book of Daniel, Tom?”

“That’s where it is, isn’t it?”

Gonzalo said, “Pardon me, but I didn’t have my Bible lesson yesterday. What are these wise men?”

“Tell him, Jeff,” said Trumbull. “Pontificating is your job.”

Avalon said, “It’s not pontificating to tell a simple tale. If you would rather—”

Gonzalo said, “I’d rather you did, Jeff. You do it much more authoritatively.”

“Well,” said Avalon, “it’s Rubin, not I, who was once a boy preacher, but I’ll do my poor best.—The second chapter of the Book of Daniel tells that Nebuchadnezzar was once troubled by a bad dream and he sent for his Chaldean wise men for an interpretation. The wise men offered to do so at once as soon as they heard the dream but Nebuchadnezzar couldn’t remember the dream, only that he had been disturbed by it. He reasoned, however, that if wise men could interpret a dream, they could work out the dream, too, so he ordered them to tell him both the dream and the interpretation. When they couldn’t do this, he very reasonably—by the standards of Oriental potentates—ordered them all killed. Fortunately for them Daniel, a captive Jew in Babylon, could do the job.”

Gonzalo said, “And that’s your situation, too, Tom?”

“In a way. I have a problem that involves a cryptogram—but I don’t have the cryptogram. I have to work out the cryptogram.”

“Or you’ll be killed?” asked Rubin.

“No. If I fail, I won’t be killed, but it won’t do me any good, either.”

Gonzalo said, “No wonder you didn’t feel it necessary to bring a guest. Tell us all about it.”

“Before the brandy?” said Avalon, scandalized.

“Tom’s host,” said Gonzalo, defensively. “If he wants to tell us now—”

“I don’t,” said Trumbull. “We’ll wait for the brandy as we always do, and I’ll be my own griller, if you don’t mind.”

When Henry was pouring the brandy, Trumbull rang his spoon against his water glass and said, “Gentlemen, I will dispense with the opening question by admitting openly that I cannot justify my existence. Without pretending to go on by question-and-answer, I will simply state the problem. You are free to ask questions, but for God’s sake, don’t get me off on any wild-goose chases. This is serious.”

Avalon said, “Go ahead, Tom. We will do our best to listen.”

Trumbull said, with a certain weariness, “It involves a fellow named Pochik. I’ve got to tell you a little about him in order to let you understand the problem but, as is usual in these cases, I hope you don’t mind if I tell you nothing that isn’t relevant.

“In the first place he’s from Eastern Europe, from someplace in Slovenia, I think, and he came here at about fourteen. He taught himself English, went to night school and to University Extension, working every step of the way. He worked as a waiter for ten years, while he was taking his various courses, and you know what that means.—Sorry, Henry.”

Henry said, tranquilly, “It is not necessarily a pleasant occupation. Not everyone waits on the Black Widowers, Mr. Trumbull.”

“Thank you, Henry. That’s very diplomatic of you.—However, he wouldn’t have made it, if it weren’t plain from the start that he was a mathematical wizard. He was the kind of young man that no mathematics professor in his right mind wouldn’t have moved heaven and earth to keep in school. He was their claim to a mark in the

history books—that they had taught Pochik. Do you understand?” Avalon said, “We understand, Tom.”

Trumbull said, “At least, that’s what they tell me. He’s working for the government now, which is where I come in. They tell me he’s something else. They tell me he’s in a class by himself. They tell me he can do things no one else can. They tell me they’ve got to have him. I don’t even know what he’s working on, but they’ve got to have him.”

Rubin said, “Well, they’ve got him, haven’t they? He hasn’t been kidnapped and hijacked back across the Iron Curtain, has he?”

“No, no,” said Trumbull, “nothing like that. It’s a lot more irritating. Look, apparently a great mathematician can be an idiot in every other respect.”

“Literally an idiot?” asked Avalon. “Usually idiots savants have remarkable memories and can play remarkable tricks in computation, but that is far from being any kind of mathematician, let alone a great one.”

“No, nothing like that, either.” Trumbull was perspiring and paused to mop at his forehead. “I mean he’s childish. He’s not really learned in anything but mathematics and that’s all right. Mathematics is what we want out of him. The trouble is that he feels backward; he feels stupid. Damn it, he feels inferior, and when he feels too inferior, he stops working and hides in his room.”

Gonzalo said, “So what’s the problem? Everyone just has to keep telling him how great he is all the time.”

“He’s dealing with other mathematicians and they’re almost as crazy as he is. One of them, Sandino, hates being second best and every once in a while he gets Pochik into a screaming fit. He’s got a sense of humor, this Sandino, and he likes to call out to Pochik, ‘Hey, waiter, bring the check.’ Pochik can’t ever learn to take it.”

Drake said, “Read this Sandino the riot act. Tell him you’ll dismember him if he tries anything like that again.”

“They did,” said Trumbull, “or at least as far as they quite dared to. They don’t want to lose Sandino either. In any case, the horseplay stopped but something much worse happened.—You see there’s something called, if I’ve got it right, ‘Goldbach’s conjecture.’”

Roger Halsted galvanized into a position of sharp interest at once. “Sure,” he said. “Very famous.”

“You know about it?” said Trumbull.

Halsted stiffened. “I may just teach algebra to junior high school students, but yes, I know about Goldbach’s conjecture. Teaching a junior high school student doesn’t *make* me a junior—”

“All right. I apologize. It was stupid of me,” said Trumbull. “And since you’re a mathematician, you can be temperamental too. Anyway, can you explain Goldbach’s conjecture?—Because I’m not sure I can.”

“Actually,” said Halsted, “it’s very simple. Back in 1742, I think, a Russian mathematician, Christian Goldbach, stated that he believed every even number greater than 2 could be written as the sum of two primes, where a prime is any number that can’t be divided evenly by any other number but itself and 1. For instance, $4 = 2 + 2$; $6 = 3 + 3$; $8 = 3 + 5$; $10 = 3 + 7$; $12 = 5 + 7$; and so on, as far as you want to go.”

Gonzalo said, “So what’s the big deal?”

“Goldbach wasn’t able to prove it. And in the two hundred and something years

since his time, neither has anyone else. The greatest mathematicians haven't been able to show that it's true."

Gonzalo said, "So?"

Halsted said patiently, "Every even number that has ever been checked always works out to be the sum of two primes. They've gone awfully high and mathematicians are convinced the conjecture is true—but no one can prove it."

Gonzalo said, "If they can't find any exceptions, doesn't that prove it?"

"No, because there are always numbers higher than the highest we've checked, and besides we don't know all the prime numbers and can't, and the higher we go, then the harder it is to tell whether a particular number is prime or not. What is needed is a general proof that tells us we don't have to look for exceptions because there just aren't any. It bothers mathematicians that a problem can be stated so simply and seems to work out, too, and yet that it can't be proved."

Trumbull had been nodding his head. "All right, Roger, all right. We get it. But tell me, does it matter? Does it really matter to anyone who isn't a mathematician whether Goldbach's conjecture is true or not; whether there are any exceptions or not?"

"No," said Halsted. "Not to anyone who isn't a mathematician; but to anyone who is and who manages either to prove or disprove Goldbach's conjecture, there is an immediate and permanent niche in the mathematical hall of fame."

Trumbull shrugged. "There you are. What Pochik's really doing is of great importance. I'm not sure whether it's for the Department of Defense, the Department of Energy, NASA, or what, but it's vital. What he's interested in, however, is Goldbach's conjecture, and for that he's been using a computer."

"To try higher numbers?" asked Gonzalo.

Halsted said promptly, "No, that would do no good. These days, though, you can use computers on some pretty recalcitrant problems. It doesn't yield an elegant solution, but it is a solution. If you can reduce a problem to a finite number of possible situations—say, a million—you can program a computer to try every one of them. If every one of them checks out as it's supposed to, then you have your proof. They recently solved the four-color mapping problem that way; a problem as well known and as recalcitrant as Goldbach's conjecture."

"Good," said Trumbull, "then that's what Pochik's been doing. Apparently, he had worked out the solution to a particular lemma. Now what's a lemma?"

Halsted said, "It's a partway solution. If you're climbing a mountain peak and you set up stations at various levels, the lemmas are analogous to those stations and the solution to the mountain peak."

"If he solves the lemma, will he solve the conjecture?"

"Not necessarily," said Halsted, "any more than you'll climb the mountain if you reach a particular station on the slopes. But if you don't solve the lemma, you're not likely to solve the problem, at least not from that direction."

"All right, then," said Trumbull, sitting back. "Well, Sandino came up with the lemma first and sent it in for publication."

Drake was bent over the table, listening closely. He said, "Tough luck for Pochik."

Trumbull said, "Except that Pochik says it wasn't luck. He claims Sandino doesn't have the brains for it and couldn't have taken the steps he did independently; that it is asking too much of coincidence."

Drake said, "That's a serious charge. Has Pochik got any evidence?"

“No, of course not. The only way that Sandino could have stolen it from Pochik would have been to tap the computer for Pochik’s data and Pochik himself says Sandino couldn’t have done that.”

“Why not?” said Avalon.

“Because,” said Trumbull, “Pochik used a code word. The code word has to be used to alert the computer to a particular person’s questioning. Without that code word, everything that went in with the code word is safely locked away.”

Avalon said, “It could be that Sandino learned the code word.”

“Pochik says that is impossible,” said Trumbull. “He was afraid of theft, particularly with respect to Sandino, and he never wrote down the code word, never used it except when he was alone in the room. What’s more, he used one that was fourteen letters long, he says. Millions of trillions of possibilities, he says. No one could have guessed it, he says.”

Rubin said, “What does Sandino say?”

“He says he worked it out himself. He rejects the claim of theft as the ravings of a madman. Frankly, one could argue that he’s right.”

Drake said, “Well, let’s consider. Sandino is a good mathematician and he’s innocent till proven guilty. Pochik has nothing to support his claim and Pochik actually denies that Sandino could possibly have gotten the code word, which is the only way the theft could possibly have taken place. I think Pochik has to be wrong and Sandino right.”

Trumbull said, “I said one could argue that Sandino’s right, but the point is that Pochik won’t work. He’s sulking in his room and reading poetry and he says he will never work again. He says Sandino has robbed him of his immortality and life means nothing to him without it.”

Gonzalo said, “If you need this guy so badly can you talk Sandino into letting him have his lemma?”

“Sandino won’t make the sacrifice and we can’t make him unless we have reason to think that fraud was involved. If we get any evidence to that effect we can lean on him hard enough to squash him flat.—But now listen, I think it’s possible Sandino did steal it.”

Avalon said, “How?”

“By getting the code word. If I knew what the code word was, I’m sure I could figure out a logical way in which Sandino could have found it out or guessed it. Pochik, however, simply won’t let me have the code word. He shrieked at me when I asked. I explained why, but he said it was impossible. He said Sandino did it some other way—but there is no other way.”

Avalon said, “Pochik wants an interpretation but he won’t tell you the dream, and you have to figure out the dream first and then get the interpretation.”

“Exactly! Like the Chaldean wise men.”

“What are you going to do?”

“I’m going to try to do what Sandino must have done. I’m going to try to figure out what the fourteen-letter code word was and present it to Pochik. If I’m right, then it will be clear that what I could do, Sandino could do, and that the lemma was very likely stolen.”

There was a silence around the table and then Gonzalo said, “Do you think you can do it, Tom?”

“I don’t think so. That’s why I’ve brought the problem here. I want us all to try. I

told Pochik I would call him before 10:30 P.M. tonight”—Trumbull looked at his watch—“with the code word just to show him it could be broken. I presume he’s waiting at the phone.”

Avalon said, “And if we don’t get it?”

“Then we have no reasonable way of supposing the lemma was stolen and no really ethical way of trying to force it away from Sandino. But at least we’ll be no worse off.”

Avalon said, “Then you go first. You’ve clearly been thinking about it longer than we have, and it’s your line of work.”

Trumbull cleared his throat. “All right. My reasoning is that if Pochik doesn’t write the thing down, then he’s got to remember it. There are some people with trick memories and such a talent is fairly common among mathematicians. However, even great mathematicians don’t always have the ability to remember long strings of disjointed symbols and, upon questioning of his coworkers, it would seem quite certain that Pochik’s memory is an ordinary one. He can’t rely on being able to remember the code unless it’s easy to remember.

“That would limit it to some common phrase or some regular progression that you couldn’t possibly forget. Suppose it were ALBERT EINSTEIN, for instance. That’s fourteen letters and there would be no fear of forgetting it. Or SIR ISAAC NEWTON, or ABCDEFGHIJKLMN, or, for that matter, NMLKJIHGFEDCBA. If Pochik tried something like this, it could be that Sandino tried various obvious combinations and one of them worked.”

Drake said, “If that’s true, then we haven’t a prayer of solving the problem. Sandino might have tried any number of different possibilities over a period of months. One of them finally worked. If he got it by hit-and-miss over a long time, we have no chance in getting the right one in an hour and a half, without even trying any of them on the computer.”

“There’s that, of course,” said Trumbull, “and it may well be that Sandino had been working on the problem for months. Sandino pulled the waiter routine on Pochik last June, and Pochik, out of his mind, screamed at him that he would show him when his proof was ready. Sandino may have put this together with Pochik’s frequent use of the computer and gotten to work. He may have had months, at that.”

“Did Pochik say something on that occasion that gave the code word away?” asked Avalon.

“Pochik swears all he said was ‘I’ll show you when the proof is ready,’ but who knows? Would Pochik remember his own exact words when he was beside himself?”

Halsted said, “I’m surprised that Pochik didn’t try to beat up this Sandino.”

Trumbull said, “You wouldn’t be surprised if you knew them. Sandino is built like a football player and Pochik weighs no pounds with his clothes on.”

Gonzalo said, suddenly, “What’s this guy’s first name?” Trumbull said, “Vladimir.”

Gonzalo paused a while, with all eyes upon him, and then he said, “I knew it. VLADIMIR POCHIK has fourteen letters. He used his own name.”

Rubin said, “Ridiculous. It would be the first combination anyone would try.”

“Sure, the purloined letter bit. It would be so obvious that no one would think to use it. Ask him.”

Trumbull shook his head. “No. I can’t believe he’d use that.”

Rubin said, thoughtfully, “Did you say he was sitting in his room reading poetry?”

“Yes.”

“Is that a passion of his? Poetry? I thought you said that outside mathematics he was not particularly educated.”

Trumbull said, sarcastically, “You don’t have to be a Ph.D. to read poetry.”

Avalon said, mournfully, “You would have to be an idiot to read modern poetry.”

“That’s a point,” said Rubin. “Does Pochik read contemporary poetry?”

Trumbull said, “It never occurred to me to ask. When I visited him, he was reading from a book of Wordsworth’s poetry, but that’s all I can say.”

“That’s enough,” said Rubin. “If he likes Wordsworth then he doesn’t like contemporary poetry. No one can read that fuddy-duddy for fun and like the stuff they turn out these days.”

“So? What difference does it make?” asked Trumbull.

“The older poetry with its rhyme and rhythm is easy to remember and it could make for code words. The code word could be a fourteen-letter passage from one of Wordsworth’s poems, possibly a common one: LONELY AS A CLOUD has fourteen letters. Or any fourteen-letter combinations from such lines as ‘The child is father of the man’ or ‘trailing clouds of glory’ or ‘Milton! thou shouldst be living at this hour.’—Or maybe from some other poet of the type.”

Avalon said, “Even if we restrict ourselves to passages from the classic and romantic poets, that’s a huge field to guess from.”

Drake said, “I repeat. It’s an impossible task. We don’t have the time to try them all. And we can’t tell one from another without trying.”

Halsted said, “It’s even more impossible than you think, Jim. I don’t think the code word was in English words.”

Trumbull said, frowning, “You mean he used his native language?”

“No, I mean he used a random collection of letters. You say that Pochik said the code word was unbreakable because there were millions of trillions of possibilities in a fourteen-letter combination. Well, suppose that the first letter could be any of the twenty-six, and the second letter could be any of the twenty-six, and the third letter, and so on. In that case the total number of combinations would be $26 \times 26 \times 26$, and so on. You would have to get the product of fourteen 26’s multiplied together and the result would be”—he took out his pocket calculator and manipulated it for a while—“about 64 million trillion different possibilities.

“Now, if you used an English phrase or a phrase in any reasonable European language, most of the letter combinations simply don’t occur. You’re not going to have an HGF or a QXZ or an LLLLC. If we include only possible letter combinations in words then we might have trillions of possibilities, probably less, but certainly not millions of trillions. Pochik, being a mathematician, wouldn’t say millions of trillions unless he meant exactly that, so I expect the code word is a random set of letters.”

Trumbull said, “He doesn’t have the kind of memory—”

Halsted said, “Even a normal memory will handle fourteen random letters if you stick to it long enough.”

Gonzalo said, “Wait awhile. If there are only so many combinations, you could use a computer. The computer could try every possible combination and stop at the one that unlocks it.”

Halsted said, "You don't realize how big a number like 64 million trillion really is, Mario. Suppose you arranged to have the computer test a billion different combinations every second. It would take two thousand solid years of work, day and night, to test all the possible combinations."

Gonzalo said, "But you wouldn't have to test them all. The right one might come up in the first two hours. Maybe the code was AAAAAAAAAAAAAA and it happened to be the first one the computer tried."

"Very unlikely," said Halsted. "He wouldn't use a solid-A code anymore than he would use his own name. Besides Sandino is enough of a mathematician not to start a computer attempt he would know could take a hundred lifetimes."

Rubin said, thoughtfully, "If he did use a random code I bet it wasn't truly random."

Avalon said, "How do you mean, Manny?"

"I mean if he doesn't have a superlative memory and he didn't write it down, how could he go over and over it in his mind in order to memorize it? Just repeat fourteen random letters to yourself and see if you can be confident of repeating them again in the exact order immediately afterward. And even if he had worked out a random collection of letters and managed to memorize it, it's clear he had very little self-confidence in anything except mathematical reasoning. Could he face the possibility of not being able to retrieve his own information because he had forgotten the code?"

"He could start all over," said Trumbull.

"With a new random code? And forget that, too?" said Rubin. "No. Even if the code word seems random, I'll bet Pochik has some foolproof way of remembering it, and if we can figure out the foolproof way, we'd have the answer. In fact, if Pochik would give us the code word, we'd see how he memorized it and then see how Sandino broke the code."

Trumbull said, "And if Nebuchadnezzar would only have remembered the dream, the wise men could have interpreted it. Pochik won't give us the code word, and if we work it with hindsight, we'll never be sufficiently sure Sandino cracked it without hindsight.—All right, we'll have to give it up."

"It may not be necessary to give it up," said Henry, suddenly. "I think—"

All turned to Henry, expectantly. "Yes, Henry," said Avalon.

"I have a wild guess. It may be all wrong. Perhaps it might be possible to call up Mr. Pochik, Mr. Trumbull, and ask him if the code word is WEALTM DITEBIAT," said Henry.

Trumbull said, "*What?*"

Halsted said, his eyebrows high, "That's some wild guess, all right. Why that?"

Gonzalo said, "It makes no sense."

No one could recall ever having seen Henry blush, but he was distinctly red now. He said, "If I may be excused. I don't wish to explain my reasoning until the combination is tried. If I am wrong, I would appear too foolish.—And, on second thought, I don't urge it be tried."

Trumbull said, "No, we have nothing to lose. Could you write down that letter combination, Henry?"

"I have already done so, sir."

Trumbull looked at it, walked over to the phone in the corner of the room, and dialled. He waited for four rings, which could be clearly heard in the breath-holding

silence of the room. There was then a click, and a sharp, high-pitched “Hello?”

Trumbull said, “Dr. Pochik? Listen. I’m going to read some letters to you—No, Dr. Pochik, I’m not saying I’ve worked out the code. This is an exper—It’s an experiment sir. We may be wrong—No, I can’t say how—Listen, W, E, A, L—Oh, good God.” He placed his hand over the mouthpiece. “The man is having a fit.”

“Because it’s right or because it’s wrong?” asked Rubin.

“I don’t know.” Trumbull put the phone back to his ear. “Dr. Pochik, are you there?—Dr. Pochik?—The rest is”—he consulted the paper—“T, M, D, I, T, E, B, I, A, T.” He listened. “Yes, sir, I think Sandino cracked it, too, the same way we did. We’ll have a meeting with you and Dr. Sandino, and we’ll settle everything. Yes—please, Dr. Pochik, we will do our best.”

Trumbull hung up, heaved an enormous sigh, then said, “Sandino is going to think Jupiter fell on him.—All right, Henry, but if you don’t tell us how you got that, you won’t have to wait for Jupiter. I will kill you personally.”

“No need, Mr. Trumbull,” said Henry. “I will tell you at once. I merely listened to all of you. Mr. Halsted pointed out it would have to be some random collection of letters. Mr. Rubin said, backing my own feeling in the matter, that there had to be some system of remembering in that case. Mr. Avalon, early in the evening was playing the game of alliterative oaths, which pointed up the importance of initial letters. You yourself mentioned Mr. Pochik’s liking for old-fashioned poetry like that of Wordsworth.

“It occurred to me then that fourteen was the number of lines in a sonnet, and if we took the initial letters of each line of some sonnet we would have an apparently random collection of fourteen letters that could not be forgotten as long as the sonnet was memorized or could, at worst, be looked up.

“The question was: which sonnet? It was very likely to be a well-known one, and Wordsworth had written some that were. In fact, Mr. Rubin mentioned the first line of one of them: ‘Milton! thou shouldst be living at this hour.’ That made me think of Milton, and it came to me that it *had* to be his sonnet ‘On His Blindness’ which as it happens, *I* know by heart. Please note the first letters of the successive lines. It goes:

“When I consider how my light is spent
Ere half my days, in this dark world and wide,
And that one talent which is death to hide,
Lodged with me useless, though my soul more bent
To serve therewith my Maker, and present
My true account, lest he returning chide;
‘Doth God exact day-labor, light denied?’
I fondly ask; But Patience, to prevent
That murmur, soon replies, ‘God doth not need
Either man’s work or his own gifts; who best
Bear his mild yoke, they serve him best. His state
Is kingly. Thousands at his bidding speed
And post o’er land and ocean without rest:...”

Henry paused and said softly, “I think it is the most beautiful sonnet in the language, Shakespeare’s not excepted, but that was not the reason I felt it must hold the answer. It was that Dr. Pochik had been a waiter and was conscious of it, and I am one, which is why I have memorized the sonnet. A foolish fancy, no doubt but the last line, which I have not quoted, and which is perhaps among the most famous lines Milton ever constructed—”

“Go ahead, Henry,” said Rubin. “Say it!”

“Thank you, sir,” said Henry, and then he said, solemnly,

“They also serve who only stand and wait.”