

ANALOG, NOVEMBER 1971

# COMPULSION WORSE CONFOUNDED

**Rob Cilson**

Raleigh put on his brightest Tuesday-morning smile, resolutely ignoring the throb in his eyeballs that coincided with the morning-after pain in his head. Stepping into the hub office, he called out, "Hello there!" with real pleasure.

Lariann Davis was not at her desk. He caught a growl that sounded like "go to bed," but it might have been "soak your head."

She was washing her contacts in the basin in one corner of the office and didn't look around. One glance at her desk, with every trouble light glowing red was enough to tell Raleigh that the week was beginning normally. The desk's intercom was on.

"Alvin?" came Addleton's voice from it.

"Right with you," Raleigh told him.

Lariann flashed him a warning look from eyes red-rimmed with anger and tears. He couldn't tell which was uppermost at the moment.

Sighing, he crossed the office, walked down the narrow corridor, and into Addleton's office by the back door. It was a magnificent place, half as big as all the production offices put together. Addleton, president and general manager of Wilder & Wilder Inc., was a hulking big man with a bald head and Mark Twain eyebrows. Except for him, the only thing in the quietly luxurious office that seemed out of place was a picture of a garish package of the company's principal product, Perfek-Pak Foods.

"She's done it again," growled Addleton. "The Archimage is sulking. What do you think of our chances of taking over Mo-Kan Food Factories?"

Raleigh took a moment to untangle these subjects. Finally he said, "Just about nil, I'd say, though it's a good idea. Mo-Kan doesn't actually synthesize food, does it? We really need a merger with some good farming company—that's if it's not too big."

"That's right. Synthetic food, except simple stuff like sugar, is still pretty expensive. All the big farm companies are building pilot plants, though. We're ahead of the competition at the moment, but they're closing fast. Now the Archimage says we can take Mo-Kan. And I have evidence that Mo-Kan is going into synthesis, too."

"They're kind of small for that, aren't they?"

"Yes. But they're starting slow, beginning with bacteria, yeast, algae, and so on. They were among the early farm companies to go in for algae culture, at first for cattle fodder. God knows how far they've gone."

"Well, I've never known the Archimage to be wrong," Raleigh mused.

Addleton gave him a piercing look. "Oh, no?"

He flushed. "Now, look, that wasn't the Archimage's fault. Neither was—"

Addleton cut him off. "O.K., you're the cybernetician. If you say the machine wasn't at fault, then it must've been the program. Now tell me where the error in the program is this time."

Raleigh hesitated. "Have you told the Archimage what you know about Mo-Kan's synthesis venture?"

"Yes. That's when it told me to start getting ready to drop the noose around their necks."

The men looked at each other.

"What were its exact words?" asked Raleigh.

Addleton punched buttons on his desk and the visiplat lit up with glowing letters floating in three dimensions before a murky fog. "Prepare to meet them and make them yours. Take \$26 million. Fire Lariann Davis."

"Cryptic as an instruction card in a board game," observed Raleigh.

"Or an oracle's advice."

"Why Lariann?" he asked anxiously.

Addleton gave him his Mark-Twain-rebuking-the-nations look again. "It's got thing about her. You should know."

As Business Manager of Wilder & Wilder Inc., the Archimage was his responsibility. "It has complained before, but it's never gone this far."

"Well, get this mess straightened out. Find out what she does to it. I've got work to do. At least the com circuits are still clear."

Automation had totally eliminated paperwork, though not red tape. Front offices no longer needed secretaries and receptionists, much less file clerks—assuming that exec knew how to punch button and get results. With the office computer "sulking," therefore. Addleton was unable even to read reports. Fortunately he could still hold conferences on the visiphone.

There was still a need for secretaries, filing, and so on, but so deeply had the robot revolution bitten into society that now one girl in a hub office, never seen by visitors, served half a dozen executives. Addleton always maintained that only the computers had saved the world from bureaucracy; he could remember a time when

office-workers were increasing at a rate from three to four times that of production workers.

Lariann was not in her office. Raleigh looked at her desk. It told him no more than she would have.

His office adjoined the hub office. Beyond was the canteen. A number of his co-workers were there, vice presidents and unit managers. He looked in wistfully, not seeing Lariann. They were telling dirty jokes and didn't notice him. He backed out. None of them would be able to go to work until he untangled the Archimage.

In his office, one wall was lit up almost solidly with red lights. He sat down, saying, "What's she been asking you now, O Grand Wizer?"

The Archimage didn't respond; it wasn't fitted with vocoders. After a moment's thought Raleigh spoke into his vocoscribe. "Read back your last instructions" appeared in front of the desk visiplat. He checked it automatically for logical self-consistency, and fed it into the Archimage.

The machine promptly responded. "That is secret information. Identify yourself. That information is not to be released in this office. Go to the desk in the hub office."

Raleigh rose up behind his desk, fists clenched, gasping for breath. He stared at the visiplat. Then, sitting down heavily, he cleared the 'plat and said, sharply, "I am Alvin Raleigh, Business Manager of Wilder & Wilder." He hesitated, appalled; the machine had no read-ins for any kind of identification check. Would it take his word?

He had already fed in the statement The Archimage printed, "The information you requested cannot be released to Alvin Raleigh. We are sorry."

For a moment Raleigh was derailed by that "we"; the Archimage was a system of seven computers. Then he placed it as the standard reply to requests that could not be filled.

Lariann was sitting at her desk, pretending to work. Unusually, none of the other men were in the hub office; they'd read the signs. She "gave him a defiant look that covered a hint of fear.

"Just *what*," he asked her, "did you tell the Archimage to do? And whatever possessed you to tell it not to give out information? Are you trying to wreck the company?"

She lifted her chin and Raleigh realized he should have begun more sympathetically. "That's none of your business."

"So I gathered," he told her dryly. "At least the Archimage seemed to think so." He looked at her a moment. She looked unhappily, but stubbornly, away. "You know what it thinks of you?"

That jarred her.

"It's told Addleton to fire you."

Lariann swung wide, startled eyes to him.

"Did you know that you've tied up every desk in the company and that not a lick of work is being done?"

She shook her head. "I just asked it for some advice, like I always do," she said unhappily. "It said it didn't have sufficient information to answer, like always, so I told it to go ahead and give me an approximation. It did, only it hasn't had time to answer yet."

Raleigh started. "It's still computing, then?"

A quick study of the board in his office had not told him much; a computer system is so complex that no board can give more than a vague idea of what's going on inside. He had concluded that, as before, the machine had been given a conflicting set of impossible orders that would take hours to untangle. So complex a system—managing every detail of the company's business second by second around the clock—could not just be shut down and cleared.

"What did you ask it this time?" Lariann flushed a beautiful shell-pink except around her eyes, shook her head stubbornly.

Raleigh sighed. "All right. Apparently it's not as bad as I'd feared. It'll listen to you. Tell it to play back its last instructions. When it has done so, tell it to cancel them. I'll take it from there. And don't ever pull that stunt again. Managing the Archimage is my business; if it stops taking orders from me, I'll be out."

She flashed him an apprehensive look and nodded reluctantly.

After ten minutes or so the board began to turn green, slowly. Whatever she'd asked it to compute had tied up every circuit not actually in use in directing operations in Wilder & Wilder's factories, warehouses, shipping centers, and so on. He'd have to check everything carefully to make sure none of those operations had been slacked.

Enough circuits were available now to check on its advice Raleigh asked for the data on which its advice to Addleton was based. After a minute or so, quite a long time it flashed a series of numbers; reports in the files. He punched them out and got instant replies; that part of the system was clear already.

The first report was an order from Mo-Kan Food Factories, Inc., for ten tons of a certain nitrogen-fixing bacterium, filled two weeks before. As a sideline, Wilder & Wilder produced and sold many microplants; it used them to produce raw materials for food synthesis. And much "synthetic" food was merely processed plankton, algae, or whatever. That was the easiest way to enter the field. A footnote quoted Addleton to the effect that a friend had let drop Mo-Kan's interest in synthesis while on the golf links.

The next report was an article in a technical magazine, published a good three

years ago. One of Wilder & Wilder's research phylogenists had written it. Raleigh skimmed through it, finally found the name of the same bacterium. It was mentioned in a brief paragraph as a highly-effective nitrogen-fixer with a remarkable output of proteins. On a graph of the outputs of various microplants, this one was far and away the best, with nearly double that of the nearest contender.

Proteins are the hardest of all kinds of foods to synthesize. This was undoubtedly an important find; it might very well be what Wilder & Wilder needed to keep ahead of the competition. Why had the Archimage allowed it to be published?

In fact, why weren't they already being pushed out of the field by competitors using their own product? Raleigh was pretty sure that the bacterium wasn't being used in their own vats. He punched for the complete sales record on it, found that, oddly, it wasn't much in demand. Only a few orders had been made, the largest Mo-Kan's. That was obviously a seed stock. The others were lab samples. A few companies had tried it out but hadn't been interested enough to buy seed stock, then. Wilder & Wilder didn't use it. And immediately after Mo-Kan bought a supply, the Archimage predicted that it would go broke and that a mere 26 million would buy the company.

Raleigh demanded the full research report on the bacterium. Its number was on the list the Archimage had given him. He turned directly to the summary and was amazed to read a crisp analysis of a bacterium that was probably the world's record nitrogen-fixer and protein manufacturer, but was worthless because of its habit of blotting up almost any kind of metallic compound that happened to be around—particularly lead, mercury, and arsenic. Since these compounds are not normally found in large quantities in the nutrient vats, the result is not necessarily poisonous, but it would be very difficult and expensive to keep the bacteria from building up sublethal doses over a long enough time. Elaborate inspection would be necessary, and contaminated vats would have to be dumped with all their tons of contents.

Mo-Kan wouldn't have bought seed stock unless they already had their vats prepared, mused Raleigh. At the very least the project would cost them some millions. A thought struck. They wouldn't have built the vats unless they intended to use the bacterium to produce food. There'd shortly be millions of sick customers. Blood tests would show what'd happened, and the resulting publicity and suits would bring Mo-Kan down.

Theoretically the FDA's tests shouldn't let them put it on the market, but they depended mostly on preventive checking. There wouldn't be sufficient metallic compounds in the nutrient to alarm the inspectors—perhaps not even in the finished product. Metallic poisons are cumulative.

It was not surprising that Mo-Kan had made that mistake; no doubt its lab tests were made with very pure nutrients. The other companies that had investigated the bacterium had been more thorough, or luckier.

Still, now that he thought of it, it was odd that there weren't more of them. Apparently only a few companies had heard of it. But all big companies subscribed

to the technical journals; the data was fed into their computers. Another look at the published report gave a hint; a few punched buttons confirmed it. The journal the report had appeared in was quite a small one. Not a house organ; a cooperative journal published by half-a-dozen companies-one of the largest of which was Mo-Kan Food Factories.

Mo-Kan had been cleverly stabbed in the back.

But not in the dark.

Raleigh walked in on Addleton abstractedly. "It's the cleverest thing I've ever seen," he said.

"The damn thing still isn't satisfied," Addleton told him.

"We're not legally responsible... hell, we're not responsible, period."

"Maybe we'll have to move her to some other position. Not responsible for what?"

"For stabbing Mo-Kan in the back. You mean Lariann?"

"Yes, the Archimage is still complaining. Who stabbed Mo-Kan?"

Raleigh stared "Wasn't this your idea?"

"What?"

Raleigh explained rapidly. Addleton, eyebrows flexing in wonder and intentness, checked the reports himself. Finally he shook his head. "I've never seen anything like it. Must've been a coincidence. I'm tempted to go ahead and take advantage of it though it's our duty to tell them what's up."

"I guess it is."

Addleton reached for the unicom, began to set it up to telefax a message. "Tell Lariann to break the news to the Archimage. See if you can settle their differences. What's the thing got against her?"

A good question. He stopped at Lariann's desk and passed on the bad word. Back in his office he sat slumped and considered the board now nearly normal.

He couldn't just ask the computer what it had against the girl.

Wait a minute. The machine had directly advised that she be fired. It didn't often make that kind of recommendation about personnel. It wasn't supposed to be specific, since it had no judgment. Therefore it must have something specific against her.

He phrased the question carefully. The response was immediate.

"Lariann Davis is an enemy saboteur and spy."

If he had not been paralyzed with astonishment, Raleigh would have leaped out of his chair. After a moment he hauled his lower jaw back up and asked hoarsely, "On what data is this conclusion based?"

The Archimage gave him a list of seven "sabotage" attempts, the latest that morning—each an attempt to destroy the effectiveness of the Archimage itself. Three of these attempts had been erased so completely it had no idea what the instructions had been. One of them was instructions to maintain a constant projection of future women's clothing styles. One was a request for an analysis of the probability of her being promoted to Office Supervisor and orders for the Archimage to warn her if there were to be any promotions made. One was for it to determine, or deduce, what his—Raleigh's—favorite foods were. The last one was for it to maintain a projection of the probability of his being promoted and to warn her of any high probability.

These were surprising enough, though he'd seen stupider requests put by people who supposedly knew more of computers than Lariann Davis. The Archimage's trepidation was understandable; each of these was an order to set up a constant program. Over the past three months she had been absorbing more and more of the computer's time and circuits for projects that had nothing to do with its basic program.

A computer might complain—if properly programmed it would complain of such treatment—but accuse a person of being a spy?

"What is an enemy?" Raleigh finally asked it numbly.

"Anything that, or anyone who, knowingly and deliberately attempts to prevent, or interfere with, the dominance of Wilder & Wilder, Inc.," the Archimage responded.

Raleigh gurgled, nearly losing his eyeballs as well as his jaw. Shakily and hurriedly he had the entire conversation electrofaxed and all but ran with the paper to Addleton's office.

Fortunately there was no one there but the general manager. He slapped the sheet down on the big desk and dropped into a chair, gasping.

Addleton bent a wondering gaze on him and read the paper intently. His eyebrows almost climbed onto his bare dome. "It sounds like the Chairman of the Board!" he grunted.

"It's out to take over the world!"

Addleton looked at the paper again, his shaggy eyebrows contracting. "Not it alone," he observed. "Wilder & Wilder. That means you and the rest of us."

"It's gone crazy!"

"I don't know," said Addleton thoughtfully. "Isn't that, after all, just what Wilder & Wilder is out to do?"

Raleigh stared at him.

"You think this is what happened to Mo-Kan?"

Raleigh hadn't started thinking yet, but that made him jump. "It's possible. Wait a minute." Stepping to Addleton's desk, he called the phytogenesist who had made the report on the bacterium. After a little difficulty he got the other to remember it.

"Oh yes, 'Mustn't Touch'. What article was that?"

Raleigh gave him the file number. Frowning, the other punched it out, skimmed through it, nodded. "I remember now. What? *Published*? My God, no! That thing had too many of our secrets in it!"

"Then how'd the Archimage come to pass it?"

Baffled, the other shook his head. He paged worriedly through it, scowled pushed the page button several more times, shook his head in amazement and said, "This isn't the report I filed! A lot has been deleted—all our classified techniques. What's left is innocuous enough." He stared at them. "What's cut is significant. One sentence explaining that the bug blots up metallic poisons like a sponge."

"And you didn't order it published?" Addleton asked.

"Hell, no. I never heard of this whatzit journal till now."

"No one else could have done it—except the Archimage," Addleton told Raleigh.

Raleigh sat back down. He stared at Addleton. "But the Archimage wouldn't. This has nothing to do with running Wilder & Wilder."

"It might have had a lot to do with it if we hadn't warned them."

Raleigh scowled. "Damn it, a computer *can't* want to take over the world. Unless it was specifically designed to do so. A computer does only what it's told, and it never improvises on its orders."

"Well, that's really what the company wants, though no one would admit it. Maybe the Archimage deduced that."

Raleigh shook his head doggedly. "No. The computer system is bogged down with day-to-day chores. It couldn't possibly see the situation as a whole. That takes a lot of mental ability, and the system has few circuits left over for that kind of thing. That's why Lariann's questions bothered it so. It has to have been instructed..."

The men looked at each other in startled awareness.

"Games plan!" said Addleton suddenly. "What kind of program was that?"

Raleigh had been reading up on Games Theory and various other esoteric studies and it finally occurred to him that business was a military game—very much like chess.

He had reprogrammed the Archimage to consider its operations as a military campaign. Business computers studied the market to determine what to produce, how much of each, and what to charge—or if it could be produced for a profit at all. It had been obvious to Raleigh that much of the market's fluctuations were created by those selfsame computers, studying the market to optimize output. If the Archimage could out think them—allow for the effects of their decisions—it could control the market indirectly.

The corollary to that was obviously that Wilder & Wilder and the



Archimage—was to dominate the world.

"How long has this been going on?" asked Addleton.

Raleigh had to think back. "Almost four years, I think."

Addleton soded sourly. "I *thought* we'd been having awfully good luck," he remarked. Both of them ran their minds back over the past, wondering how many of their competitors' strokes of misfortunes had been caused by the Archimage.

"I would've said that a computer couldn't take over the world because it has no direct influence on it," said Raleigh slowly. "But the Archimage has plenty of pull, it seems."

Addleton looked at him sharply. "Think there's any real danger?"

Raleigh shook his head. "Any time we want to change programs, all we have to do is tell it so, and it'll schedule things so the company doesn't lose money. Of course you have to have the new program ready, and it takes a month and the computer system itself to cut one. But, if there was any *danger*, we could just shut down without planning for it. It'd cost us in penalties for late deliveries, and so on, is all."

"And what if the machine refused to shut down?"

Raleigh laughed. "You've been viewing too many adventure shows. Immobile computers don't have self-contained power supplies. You just pull the plug. And you don't need to worry about being electrocuted; the total amount of energy in a computer wouldn't much more than kill a mouse. It couldn't harm a man. Or take over the power plant by sending signals along the wires, or shut and lock doors, that kind of thing. It hasn't got readouts for it. Such defenses would have to be built deliberately."

"So the only danger is this indirect poisoning stuff, though poison wouldn't be his only method of getting results," said Addleton.

"No. And even here, nobody would have died—unless they were already pretty weak. The only real sufferers would have been Mo-Kan. Question is, is it safe—for the public—to keep the Archimage on this program?"

"It's a temptation," Addleton smiled. "It'll work only until the other companies catch on. And when they do," he added, the smile fading, "My God! Ten thousand computers fighting each other for control of the world!"

"Could they actually take over? Say, if they began to cooperate with each other?"

"Such cooperation is called merger," pointed out Addleton. "No one computer system could run the world. And computers can't cooperate without being reprogrammed, if they've been programmed to fight each other. There *might* be some danger," he added, looking at Raleigh, "to us. It's already called for the firing of one employee—a thing no business computer does. It may start making the same kind of decisions about management personnel any time." He brooded on it, said cautiously, "I think we'll leave it on this program, now that we know what it's doing."

Well check every action carefully for harm to the public or us. And, let's keep it between you and me."

"That might be safer. If a leak got out, the public would panic. And worse, other companies would soon be on the bandwagon—or the march." They grinned at each other. "They'll never know what hit them."

"This program does have its drawbacks, though," said Addleton. "It's prepared to believe the worst of people who make mistakes or waste its time."

"My God, yes. What do we do about Lariann?"

Addleton picked up the sheet of paper with her transgressions on it. He looked them over with a faint smile, looked up at Raleigh, and said, "For a starter, you might try proposing to her."

But when Raleigh got back to the hub office, he found Lariann's desk lit up with red lights again. Two quick steps took him to a point where he could see the back wall of his own office through the door he had left open. It looked like a Christmas tree in Red Square.

"Not again," he groaned. "What'd you do this time?"

"I've found out what's wrong with the Archimage," she told him proudly. "When it gets this computed, it'll be all right."

"Gets *what* computed?"

"Well," she blushed, looked down at her desk. "You did invite me out tonight, didn't you? On a Tuesday night?"

She hadn't she had explained coyly, been "available" over the weekend. He was serious enough to ask her out on a Tuesday the acid test.

"Then I'll show, you." First she had asked it, *What does Alvin Raleigh think of Lariann Davis?* It had answered: *He thinks she is a spy from some competitor.* It could be sure he thought that, having told him so itself.

She had then instructed it, *Lariann Davis is not a spy. Recompute everything on this basis.* The ironic thing was that, though it believed her to be a spy, it was programmed to take orders from this desk, regardless of who gave them. The Archimage was only a machine. So it was now thoroughly changing its rigidly logical mind.

Raleigh gasped. How far would such reprogramming go? It had firmly believed her to be a spy, as that was consonant both with her actions and with its own program. Her actions could not be changed. Therefore—

He stared through his door at the blazing wall. Some major mental operation was certainly going on—far greater than her simple instruction would have indicated.

Raleigh sighed. Then he smiled weakly at Lariann.

"You came, you saw, you conquered," he murmured.