

*"Brains flashed out his lighted message across the moving tape"*

by EANDO BINDER  
(Illustrations by Frank R. Paul)

Binder has told us that he is back in science-fiction to stay, and hopes to attain his former position of favor with the readers. Furthermore, he is intent on achieving his goal by writing material that *is* essentially pure Binder, *with* concession to no special formula. We can't argue with that kind of integrity and spirit.

*Though the military considerations of a station in space have been emphasized by scientists, probably with the hope that such an angle might facilitate funds for such a project, one of the greatest benefits to accrue from successful establishment of a space station or an ultimate base on the moon would be the advantages of establishing an astronomical observatory. The effectiveness of our present telescopes would be increased manyfold, once outside the deep ocean of the earth's atmosphere. The new clarity of observation would unveil many of the universe's greatest mysteries—but, just as surely, add still greater mysteries to take their place. Binder tells, with considerable imagination, the story of a variable star that didn't conform.*

"MYSTERY of the ages," muttered Robert Oxman, senior astronomer, coming out of the darkroom with a damp plate.

Paul Darby turned from his dials. "You mean that variable in M-81?"

It was quite an unnecessary question, for that was all the old man ever talked about these days. "What is it doing now, sir?"

"Cutting up capers as usual," said Oxman bitterly, swallowing a white pill. "And giving me ulcers. There's no rhyme or reason to its behavior. It just doesn't fit in the scheme of things."

He looked up out of the huge steelophane cone, through its clearness, at the piercing stars swimming in space. The unwinking stars. Here, at the Lunar Observatory, were the ideal conditions for observing the outer universe. A hundred yards away the Giant Eye hummed, keeping on target with the majestic revolution of the sun-sprinkled vault above.

The target had shifted now, but before it had been M-81, the spiral galaxy some two million light-years away. And within the myriads of M-81 pulsed one star, brighter and dimmer, ceaselessly. A Cepheid variable, but standing by itself in its unorthodox data.

"Mystery of the ages," Oxman gritted again.

Other staff astronomers at nearby desks exchanged grins with one another. As long as they could remember, old Oxman had harped on that worn dirge. Assigned to Cepheids some forty years ago, the topmost living expert on them, Oxman had spat out that phrase day in and day out. Always in baffled dismay. His tall gaunt figure jerked with the words. His wrinkled eyes held weary frustration.

"See here," said Stanhope of red giants, whose desk was nearest. "You're making too much of a thing out of this, Oxman. A mountain out of a molehill."

"You think so?" Oxman snapped peevishly. "Mind you, this thing has been going on for *five thousand years*. Since the 20th century! I'm the last of a long line of astronomers—hundreds of them—who observed Old Unfaithful, wracked their brains over it, and never came up with any explanation." He glared. "Tell me, have you any red giant mystery unsolved for five thousand years?"

Stanhope subsided with a sigh and turned back to his own work.

Paul Darby, young and new to the staff, was more receptive. "Old Unfaithful," he chuckled. "Guess that name fits all right."

"Like a glove," nodded Oxman, sourly. "That Cepheid was first spotted by the old-time 200-inch Palomar scope, back in 1950. From that day to this—five thousand and forty years later—it was watched constantly. We have mountains of photographs of it. A hundred trained minds puzzled over it,

generation after generation. A mystery that spans time from the 20th to the 70th century—unsolved!"

Then, apologetically, "Sorry, I must be boring you, Paul, like all the others—"

"Please go on, sir," Darby invited quickly, with a spark of pity for the old man. "I haven't heard the full story of Old Unfaithful. Besides, I have time to kill while Brains wrestles with his homework."

Darby grinned and patted his machine. He was the technician handling the electronic brain that digested all the observatory's cosmic equations. "Brains" clacked and hissed beside him, working madly at the moment on a complex problem of red shifts. While his ingenious mechanical partner labored, Darby was at leisure. He waited with willing ears.

Oxman leaned back in his chair, nesting his hands, and the words tumbled out of him as if relieving an ache inside him.

"There are many kinds of variable stars. But you see they all dim and brighten at regular intervals. Their periods may range widely from a half-day to five hundred days. Their luminosity may jump and fall as much as nine magnitudes. Their spectrums may vary from red giants to white dwarfs. But they all have constant, unchanging patterns of their own, regular as clockwork. All of them. And after a thousand years they'll still be doing the same thing. You can depend on them, as ... well, as they do on Old Faithful, that geyser down home in Yellowstone Park."

"But Old Unfaithful," Darby asked, "has never repeated his pattern, not even in five thousand years?"

"Never," snapped Oxman, almost with a growl. "Not once. He's got a new bag of tricks every time an old fool like me takes a squint at him. No pattern—and it's really quite impossible, you know. It throws all our well-ordered theories of the universe out the garbage chute. It cracks the very foundations of the cosmos, as we know it."

Stanhope turned from his desk with a snort. He pointed up at the unmoving vault of stars. "I don't see the universe falling apart," he jibed, grinning. "Looks quite stable to me."

Oxman tried to ignore him but winced visibly.

Darby hastily filled the gap. "But I don't quite see. Why is it impossible for a variable to have no pattern?"

"Because," spat Oxman in tones tinged with high blood-pressure, "it's the *only* fool star in the entire macrocosmos that we never fitted into *any* theory. Think once. There are maybe a billion galaxies out there. All of them contain Cepheids, red giants and white dwarfs, nebular clouds, coalsacs, and star clusters, multiple suns, dead companions, red shifts, and so on down the line. But one theory covers *all* red giants in *all* galaxies. One theory covers *all* novae in *all* galaxies. Without fail. There are never any renegade exceptions. And of the billions of Cepheids we've catalogued, in the billion galaxies, they all fit theory perfectly."

He pointed a damning finger upward. "All except *one*."

"Old Unfaithful," murmured Darby, struck by the wonder of it himself. "Quite a bad egg, eh?"

"If it's any consolation," spoke up Stanhope again, with a straight face, "maybe other astronomers in other galaxies besides ours are getting ulcers from Old Unfaithful too."

In spite of his rage, Oxman had to smile. Other galactic observers *did* see Old Unfaithful, of course. They too must be fuming at its outrageous deviltry. Silly as it was, this thought made Oxman feel better.

"Yes, maybe a million other observers, in a million other galaxies, are cursing Old Unfaithful, too. Watching him blink on and off like a will-o'-the-wisp, running through his crazy repertory, in a series of totally unrelated flashings, like a lighthouse gone wild in far space. A beacon handled by a madman—"

Stanhope burst into a genuine laugh. "You know, Oxman, the way you put it there, it almost sounds like a *message*. Something like Morse code, for instance—only of course a different code entirely. I can just picture some mad magician in M-81 playing around with Old Unfaithful, flashing out a mocking message."

After a glance at Oxman's stricken face, Stanhope sobered and choked down his laughs. "I'm sorry, Oxman. I didn't mean to needle you like that about your pet headache. Sorry if I touched your sore spot."

Oxman was staring as if his brain had exploded.

"Message!" he repeated. He quivered, swallowed. "What if it were just that—a *code* flashed across

space from M-81? From intelligent beings there?"

Stanhope swung his chair back. "Now, you're *not* taking me seriously," he protested, startled, alarmed. "Get hold of yourself, Oxman. Don't let this little star get you down."

"But that's the answer," Oxman whispered. "Stanhope, you hit it. Instead of a crazy *natural* variable, why not a Cepheid *controlled* by intelligence? The answer was so simple and obvious—for five thousand years—and nobody caught on!"

Stanhope and Darby both gaped. The old astronomer kept spilling out words eagerly.

"Don't you see? You meant it as a joke, Stanhope, but it fits perfectly. People in M-81 wish to communicate with us, or any other galaxy. No ship can cross the immense gulfs, no ship we know of. And very likely no ship they know of. Radio waves too become too weak for anyone to pick up and amplify. Even beamed telepathy, such as we use, can't stab those inconceivable miles. But the one thing that bridges the universe from end to end is *light*. A light-signal is the only sure way to set up communication between galaxies. And that's what the people of M-81 have done."

"You sound mighty certain," Stanhope said, skeptically. "But think, that means they somehow manipulate a giant star. Make it pulsate, dim and bright, according to their code. How do you go about doing *that* little task?"

"Who knows?" said Oxman, singing inside. "And who cares, really? So they're master scientists. They have giant machines or rays or some method of making Old Unfaithful pulsate varyingly. Maybe they have the secret of controlling the atomic energy output of Old Unfaithful, as we control an atomic pile. Anyway"—he brushed that aside sweepingly—"there you have it. A message flung across space to another galaxy. And we idiots took five thousand years to catch on."

"Too bad," put in Darby, unthinkingly, "that whole message lost—"

"Not on your life," Oxman yelled, running to the files, forgetting his rheumatic knee. "We have complete microfilm records of Old Unfaithful from 1950 on. His whole message. Here, in this drawer—"

Oxman yanked too hard, and the file labeled M-81 spilled its contents all over the tile floor. It took them a painful, breathless hour to sort out all the cannisters of microfilm. Even Stanhope helped, as well as Darby.

At last Oxman held them up, the complete records of Old Unfaithful. "Now to *read* the message."

"BUT how can we?" objected Stanhope, a little stunned by what his chance remark—in sheer jest—had started off. "What basis of comparison will we have? Naturally, the people of M-81—assuming they exist never devised the Morse code, or the interplanetary code, or any code we know of. What's more, even if we cracked the code and got words, what words would they be? Unknown words of creatures using a language we don't know. One impossible hurdle after another. It's hopeless—"

"No!"

The word came like a shot from young Darby. "*Brains* over there—the electronic brain. He solves every other problem in galactic astronomy, many of them staggering to the human mind. We just feed him the data and he does the rest. Brains can crack the code, I'm sure. Translating the language will be tougher, but he'll do it."

Brains was not a giant computer. It was no more than ten feet wide. But it was packed with mental might. Countless tiny transistors and incredible mazes of synaptic relays and spongy centers of metallic cells added up to a thousand human minds. And Brains had not yet met a celestial riddle that it could not solve within twenty-four hours.

"I'll have to get clearance for Brains from the director," said Oxman, turning to the intercom box on his desk.

"Can't you wait a few days?" answered Director Peterson, chief of Lunar Observatory, petulantly. "After all, a dozen other computations are ahead of yours, waiting their turn. How about three days, Oxman?"

Oxman sucked in his breath, spoke savagely.

"You can't do this to me, Peterson. I'm an old man. I have ulcers and a weak heart. I may die any

day. And if I were to die without knowing the message from M-81, I'd *haunt* you for all eternity."

"All right," said Peterson, half stern, half coaxing. "Tomorrow, then."

"Now!" yelled Oxman. "This minute! I've sweated over Old Unfaithful for forty years. A hundred other Cepheid men are turning in their graves every time Old Unfaithful blinks. Now, Peterson—it's got to be *now!*"

"Look here," began Peterson weakly. "I don't have to remind you that I'm in charge here and—" Oxman smashed the voice box. He turned to Darby.

"Whatever's in your machine now, throw it out. And don't worry about Peterson. By the time he comes running here, we'll be started, and then what can he do?"

Darby hesitated even at the fire in the old man's eye. Stanhope was shaking his head too. "You shouldn't do this, Oxman," he protested. "Bucking Peterson's authority . . . taking matters in your own hand. He could break you for this, and break me too, for helping you!"

Stanhope was carrying microfilm to the electronic brain. "Well?" he snapped at Darby. "What are you waiting for? Clear Brains and get started. And I hope Peterson has a stroke."

Darby quickly cleared the Brain. Holding his breath, he fed it the microfilm of Old Unfaithful. Brains was specially designed for astronomy. Microfilm plates of stars and galaxies were its grist. All Darby had to do was adjust the dials mathematically, asking it in formula form to integrate the blinkings of Old Unfaithful, which he fed into the machine as M81VC889, the star's official designation.

Then he stepped back, beside the two older men.

"What will the message be?" Oxman breathed. "What are the first words we'll hear from any outer galaxy, in the entire universe around us?"

"If the machine can handle it," said Stanhope, skeptically.

The electronic mastermind hummed and clicked and chewed and ruminated. After a while a faint buzz sounded from it. Darby looked blank. It had never made that particular sound before.

A moment later there was a loud click and then the machine ejected the microfilm and fell silent. They stared at the lights fading from its reading tape.

***Rejected. Cannot solve.***

"See, I told you," said Stanhope, sorrowfully. "Even Brains couldn't do anything with that double brain-breaker . . . an unknown code and *an* unknown language."

Oxman stood stricken, haggard, inwardly collapsing.

"The first time—the first time Brains has ever been stumped. Now we'll never know if that was really a message or not. Forty years . . . hoping to solve the mystery . . . mystery of the ages . . . go to my grave without knowing. . . . I'll never know. . . ."

"Oh yes, you will," said a quiet voice behind them.

Stanhope whirled. "Peterson," he gasped.

"Don't you see what's wrong?" Peterson said. "Brains never handled code and language before. He has no 'memory' of such things, to start with. So we'll give him a memory, educate him up to it."

He turned, singling out one of the other astronomers, who were there, now, in a silent excitement which had swept through the observatory. "Emory, go over to the library and bring back all books on Morse code and every other code. Cryptograms. Anagrams. Basic English. Planet languages. All that stuff. Give him a hand, Smith."

Peterson turned away from Oxman before the old man could express his gratitude. "Good luck, Oxman. Let me know when you crack the mystery of Old Unfaithful."

IT WAS a long job. All night they labored. They fed Morse code to Brains, who solved it in the wink of an eye. They worked up to the Interspace code, then complex codes from the last space war. Then they poured in language fundamentals, climaxing it with the fearfully complex native language of a dead race of Procyon.

Oxman, Stanhope, and Darby. They worked as a team, spelling each other for rest.

Finally Oxman called a halt. "Enough. Brains has a 'memory' now of codes and languages. He can break any code, into any language. Feed it the code of Old Unfaithful again."

Again they waited in feverish anxiety, as Brains began his low, laboring whine. Five minutes passed. Ten. But the reject sign did not flash on, this time.

Relaxing slightly, Darby pressed the timing stud. "Brains can always tell you how long it'll take him to solve a problem. Let's see how much time he needs for this one—"

The lights read—*Nineteen hours, twenty-three minutes, fourteen seconds.*

"Poor Brains," muttered Stanhope wryly. "The longest he ever took before was slightly over nine hours. This one will take twice as long. Can *he* get ulcers?"

Oxman groaned. "How can I wait that long? How can I wait twenty hours for that message from M-81?"

Stanhope chuckled. "You? Those others ahead of you waited five thousand years. What does twenty more hours matter?"

But to Oxman, those twenty hours were longer than five thousand years. He didn't sleep or eat. They forced coffee on him as he sat and watched Brains, as eternity after eternity he kept clicking and humming, wrestling with the most Herculean mental problem of all human history.

Stanhope didn't sleep either. Darby did, in fits and snatches. Nor did the rest of the thirty staff men take away much time from the vigil. They stood around in groups and knots, whispering, their own work shelved, forgotten.

"My exploding novas," said one. "Small stuff compared to this—a message from another galaxy. And here's Peterson again, for the twentieth time. Why does he bother *pretending* to work?"

"Well, let me know the results right away," Peterson said, after hovering around for a while. "I'll be in my office waiting . . . have important work to do, you know."

He took two steps away, then turned back. "Oh rubbish. Move over, Stanhope. Why should I jitter alone in my office?"

They talked at times, in the dead moon quiet.

Stanhope came up with another brain teaser.

"Look, Oxman. M-81 is two million light years away. That means the message was *first sent* that long ago. Are those people even alive today? Maybe it'll be a message from the dead. A hello and farewell from a civilization long since fallen to dust."

"That's a possibility of course," said Oxman. "In which case they must have set up some kind of long-range method of pulsating Old Unfaithful, even beyond their extinction. Queer thought, isn't it?"

Peterson was struck by an amazing afterthought. "Why would they bother? Why would they go to such fantastic lengths, somehow to manipulate the fires of a gigantic star, just to say, 'Hello, neighbors! Greetings from M-81. The weather's fine here. Come and see us sometime, only we'll be dead and buried by then!' It doesn't make sense."

"I think," piped up Darby, "it would have to be an *important* message. Maybe a *distress* call, assuming they're in danger and need help."

"Help that wouldn't and couldn't arrive till millions of years later?" Stanhope said. "Hardly. The only other possibility is that it's a . . . well, a *warning*."

They cast wondering glances at each other.

"But that's absurd too," Peterson said. "It takes us two million years to *receive* the warning. If it's danger that hit them, and that might hit us, would this danger take two million or more years to reach us? Would we have time to avoid it?"

Oxman rubbed his tired face.

"We can't use ordinary space-time concepts here. The signal itself—look how they stretched it out over a period of five thousand years. In other words, there was no 'hurry,' in earthly terms. They carefully laid out their message to span fifty centuries, to warn us of a danger that might be millions of years in the future. It's all on such a colossal scale that numbers and years mean nothing."

Peterson nodded. "Astronomical time is the only sensible yardstick to use—some cosmic clock in which five thousand years is one minute. Thus the message is flashed out in that one short 'minute' but many 'days' or 'weeks' ahead of the actual danger. And therefore we are given plenty of time to avoid it."

"How do we know it's a warning?" Stanhope was now skeptical of his own suggestion.

"We don't," admitted Oxman. "Yet somehow—"

He fell silent, but to them all, a warning seemed to be the only logical explanation for the cosmic telegram flashed across the transgalactic void.

At last Darby held up a hand and began to count. "Five—four—"

There was a stir among all the waiting men in the dome.

"—three—two—"

Heavy breathing.

"—on e—zero—"

Silence.

Then a buzz. Promptly on time to the second, Brains flashed out his lighted message across the moving tape. The electronic genius had done its job, not only cracking the code of the pulsating star, but ferreting out the language behind it, and then translating those words into our language.

Darby's face held pride. And perhaps the hum of the machine, too, was triumphant at its nameless feat.

And at last the answer was there, before their eyes, the message from M-81.

***"Warning to all galaxies. Danger awaits to strike you, as it has struck us. But before we were wiped out, we sent this message.***

***"We caused one star to fluctuate like a variable, by means of subatomic force-fields that serve as curtains around the star. We installed the controlling unit on a planet of that star, set to continue flashing its signals long after we were gone.***

***"A synchronized tape message automatically controls the unit, making the star flash bright and dim according to a universal code built from pure mathematical fundamentals. Intelligent beings with astronomical science would note the variable star that obeyed no known laws, and soon realize that it conveyed a warning."***

Soon, thought Oxman wryly . . . five thousand years . . . and yet maybe that was soon, on the clock of cosmic time . . .

***Do not fear sudden doom. The danger must cross inter-galactic space, and must travel far slower than light. Thus our warning at the speed of light will certainly reach you long before the menace. You have time to prepare and avoid destruction. The one clue that would have saved us came too late, but we can pass the secret on to the rest of the universe. The invading horror is an amorph—"***

On the screen, the flashing words stopped and the machine fell silent.

Stanhope groaned. He was the voice of them all as he almost screeched and said—"The rest? *What's the rest?* Of all times for Brains to break down! Fix it, Darby. And hurry, man! We want the rest of it."

Stanhope's voice stopped dead, at the look on Darby's waxen face.

"Brains didn't break down," Darby said, stricken. "Remember, it took five thousand years for Old Unfaithful to transmit this much. Perhaps it will take another five thousand years—"

"No!" whispered Peterson in horror. "Oh no!"

Darby wept as he blurted out the rest: "Brains came to the end of the message—as much as was transmitted so far. I will never know more than a few more words, even in my lifetime—and I'm the youngest man here."

None of them dared to look at the face of Oxman, who was over seventy.

## SCIENCE QUIZ

Test your scientific knowledge with this questionnaire. The answers are in the fiction stories on the pages listed.

1. What is *psychokinesis*? (p. 6)
2. What is meant by clairvoyance? (p. 6)

3. Are all variable stars the same size? Do they have similar spectra? (p. 21)
4. What is the meaning of Xenophobia? (p.41)
5. Has a human egg ever been fertilized outside of the human body? (p. 59)
6. Does an embryo share its mother's blood circulation? (p. 60)
7. What nourishes a human fetus? (p. 60)
8. By what process are fluids passed through thin membranes? (p. 60)
9. How does Einstein define the fourth dimension? (p. 61 )