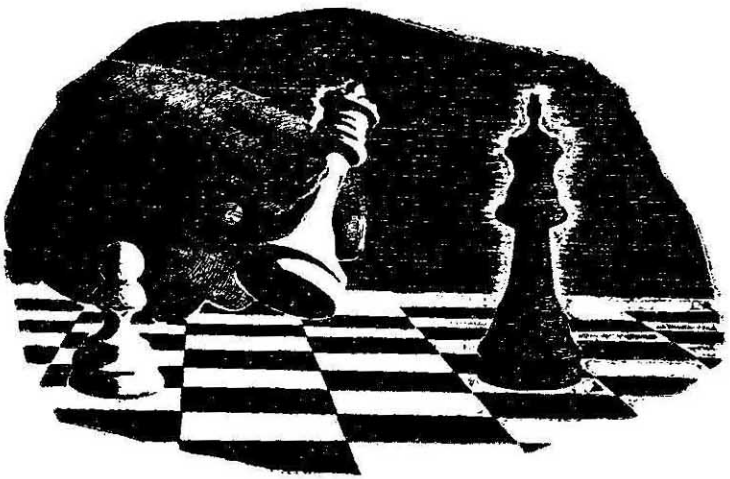
Trouble

by GEORGE O. SMITH



"It takes two to make a quarrel" doesn't mean two different people, really—just two different viewpoints!

Tom Lionel, Consulting Engineer, awoke with a shake of his head. At once, he was out of bed. He consulted first the calendar and then the clock. The thought struck him funny. He hadn't been drinking, but the idea of looking at a calendar upon awakening might be construed as an admission that he didn't know what *time* of what *day* it was.

Or mayhap what month.

"Ding it," he grunted. "I've been away again."

He dressed by stages. At the trousers department, Tom wandered out into the living room and stood over a chessboard, studying the setup. The opponent had moved the queen to the rook's fourth, menacing his bishop. Tom smiled and moved his knight to his knight's sixth and checked the opponent's king on the rook's first, and the queen simultaneously. He slid the drawer below the table open and removed a little

standing sign that said, in red, block letters:

CHECK!

"Let him try that one, will he?" laughed Tom. The move was basic; in checking the king and menacing the queen simultaneously, Tom had —or would upon the next move— collect himself his opponent's queen with no great loss.

At the shirt and necktie stage, Tom Lionel stood teetering on his heels before the bookcase on the right of the fireplace. He took from the case a slim volume and read the title with considerable distaste:

"Theory of Monomolecular Films in Fission-Reaction"
By
A. G. Rodan, Ph.D., M.M., LL.D.

"Yipe!" exploded Tom as he opened the book and glanced at the price: $9.50. With ease he prorated the price against the thickness of the volume and came to the estimate that the book had cost approximately nineteen dollars per inch excluding covers. He riffled through the pages and paused here and there to read, but the pages themselves were a good average of four lines of text to the rest of the page full of nuclear equations.

Tom Lionel snorted. He ran down through one of the arguments and followed it to conclusion.

"Why can't he get something worth reading?" he yawned, putting the book back in its place. "Darned impractical stuff." As usual with a man who spends much time in his own company, Tom Lionel talked aloud to himself—and occasionally was known to answer himself back. "The whole trouble with the entire tribe of physicists per se is the fact that once, someone told one of them that he was a theorist, an idealist, and a dealer in the abstract. Now the bunch of them are afraid to do anything practical because they're afraid if they do, people won't know they're physicists. Physicists are a sort of necessary, end-product evil."

During the breakfast section of Tom's morning duties, Tom read the latest copy of the "Proceedings of the I.R.E." with some relish. A paper on the "Crystallographic Generation of Microwaves" complete with plainly manipulated differential calculus and engineering data occupied most of his time. The rest of the time through coffee he was making marks on the tablecloth with the egg-laden end of his fork and trying to fit the crystallographic generation of microwaves into a problem that made the article most timely; the solution for which he had been seeking for a week.

The mail arrived. Three household bills were filed in the desk to await the first of the month. Two advertisements were filed into the wastebasket. One thick letter addressed to Thomas Lionel, Ph.D., M.M., was taken carefully between thumb and forefinger and deposited in a letter file.

Tom then inspected the other letter file and found two letters addressed to Tom Lionel, Consulting Engineer, which he opened and read. One was from a concern in Cedar

Rapids that wanted some information on a method of induction heating glued joints selectively without waiting for the normal drying time. The other was a letter from a medium-sized town in Illinois pertaining to some difficulty they were having with police-radio coverage of that area.

Both letters meant money, and Tom Lionel set the first aside while he started to work on the second. From the engineering data supplied by the local engineer, Tom decided that a change in antenna height and a conversion from quarter-wave current fed to a one and one quarter-wave current fed antenna would give the desired coverage. He concluded his letter with four pages of calc, seven diagrams, and as a last measure dropped a photograph of a similar installation in the envelope.

He gloated. That would net him a pretty penny. The guy who hung that antenna on top of the water tank thought he was smart, getting all that height. But the roof was metal, and therefore the radiation angle took off from the rooftop as a basis rather than the true ground a hundred feet below.

The tank top was greater than three wave lengths in diameter, and conical to boot. Tom grinned at the maze of mathematics that solved it —and as far as he was concerned it was solved, for Tom Lionel was a top-flight engineer.

He checked on his calendar. Metal for the sonic job was not due for a week yet; a minute casting was still being held up for the foundry's pleasure; and the life-test of the bearing-jewel for the Watson Instrument Corporation was still on. Good jewel that. No sign of freeze-up or wear-out after twenty-seven million cycles.

"Theory of Monomolecular Films be hanged," he snorted. "He's the kind of a guy that would try to analyze the brew that MacBeth's three witches were cooking up. And don't ask why!"

What he objected to most was the other's unconcern at spending money. Nine bucks and fifty cents for a book of the most questionable theory —and nine fifty that the other didn't really earn. It was getting worse. The other was really beginning to obtrude. He hadn't minded, particularly, except for the mental anguish. He'd become reconciled to it by sheer rationalization. Way, way down deep in his heart he knew that he'd have enjoyed being a physicist himself. But physicists were not particularly practical, and money was made with practical things. He knew, and recognized, that his retreat from being a physicist himself had given him a dislike for the breed, especially when he knew that solution of a problem was theirs, but reduction to practice was his. He was continuously being forced to take some physicist's wild-haired scheme and making it cook meat, open cans, or dig post holes. The physicist had all the fun of standing on the threshold and delving into phenomena that abounded just over the line. And then instead of working on the suggestion that the physicist had located in the wilder-

ness, the physicist just tossed it over his shoulder into Lionel's lap and went on digging.

Obviously it must be fun to dig in the unknown, but why in the name of sense—

"Theory of Monomolecular Films in Fission-Reaction," scowled Tom Lionel. "A hypothesis on a theory for an idea, based upon a practical impossibility, and directed at a problem solvable only by concentrated masses. He should be working in a negative universe where nonmatter repels nonmatter disproportionately to the nonmass and inversely disproportional to the not-square of the not-distance between. Holy Entropy."

Tom Lionel went out of the house, mentally tinkering with the glue-joint heating problem. That shouldn't be hard, he thought, high-frequency heating was no trick, though the furniture company probably had no one in the place that knew what high frequency really meant.

He'd take a chair, rip it apart at the joints, and start tinkering with the big radio-frequency heater in the lab. . Another fat consulting fee —eminently practical and satisfying—from the simple engineering of a means to accelerate the drying of glue by electronics.

Eminently practi—*hell!*

Lionel stared. The door closed slowly behind him as he walked ever so slowly across the floor of the lab. There was his radio-frequency heater, all right. But it was not in its usual place. It was across the room nuzzling up against another piece of equipment—the latter new, shining, and absolutely alien to the lab.

Tom went over to the set-up and inspected it with critical derision.

The alien piece of equipment had been a standard model of mass spectrograph. Its sleek sides were gaping open, and the high-frequency heater was permanently wired—piped—into the very heart of the spectrograph. Peering into the maze of one-inch copper tubing that led from the output of the high-frequency heater to the insides of the spectrograph, Lionel saw at once what the reason was.

The spectrograph had been overhauled by the physicist. It now contained a pair of "D" chambers.

Operating on the cyclotron principle, the spectrograph was using the output of the high-frequency heater to energize the D chambers. Lionel nodded. The frequency was about right; could be adjusted to the proper value without any trouble at all. He felt an infinitesimally short twitch of admiration for the idea before he started to roar in anguish.

His first impulse was to rip the gadget apart so that he could go to work on something practical. But the engineer's admiration for the idea stopped him.

But this was getting thick.

It had been getting thicker for a long time. It was getting intolerable. He didn't mind too much having volumes of utterly cock-eyed theory about the place, but when the physicist starts to appropriate equip-

ment for his screwball ideas, it was time to call a halt.

Lionel left the laboratory, returned to his house, and called a psychiatrist.

An hour later he was in Dr. Hamilton's office.

"Why are you here?" asked Hamilton pleasantly.

"I want to get rid of a physicist."

"Tell him to go away."

"Can't. Impossible."

"Nothing is impossible."

"Look, doctor, have you ever tried to light a safety match on a wet bar of soap?"

"Suppose you tell me about it, then."

Tom Lionel was more than talkative for a half hour.

"A clear-cut case of split-personality. A most remarkable cleavage."

Lionel muttered something.

"What did you say?"

"I'd rather not repeat it," said Tom.

"Please—it may have a bearing on your case."

"I was merely thinking of an hypothetical case. Says the doctor to his associate: 'Doctor, look at this magnificent tumor,' and his buddy answers: 'Lovely, but you should see my case of angina; it's positively beautiful.'"

"Oh?"

"So I'm a most remarkable case, huh?"

"You are. There seems to be a deep-seated liking for one another that has been barred psychologically by certain factors in your youth. You play chess. You respect one another's property—"

"That's what you say. The other bird just screwed up my dielectric heater to fiddle up a cyclotronic spectrograph."

"Might try putting it to work," observed Hamilton.

"Oh, I will. After all, he can't get ahead of *me*."

"Then why the outcry?"

"Because who knows what he'll do next."

"He's appropriated things before?"

"Only to the extent of buying books?"

"What manner of books?"

"The last one he purchased was entitled 'The Theory of Monomolecular Films in Fission-Reaction.'"

"Mind explaining that? It sounds like Greek to me."

Lionel smiled tolerantly. "If you have a flat table and a pile of kid's toy blocks, you can either build a structure or lay 'em on the table in a single layer. Since molecules are often called the building-blocks of the universe, the analogy is quite clear. The blocks in a single layer form a monomolecular layer. Fission reaction is a self-sustaining nuclear reaction."

"Sounds quite erudite."

"In the first place, no one with any sense would try to make use of it. It is the type of volume that a physicist would write in the hope that he will get letters pro and con on the subject which will be useful in forming a later theory."

"Then it is not a complete waste of time."

"Any time I lay out nine bucks for a half-inch of paper—"

"Expensive, isn't it?" asked the doctor.

"Sure. Those things are not best sellers, usually. The publisher puts it out in the name of science and must at least get his printing cost out of the very limited edition."

"I see. And you want to get rid of this physicist?"

"Who wouldn't. After all, I had this body first. He's an interloper."

"Seems that way."

"It is—and it's annoying."

"We may be able to do something about it," said the psychiatrist. "Permit me to think about this for a few days. We'll have another consultation in a week. We may require another one before I make a decision. But it seems to me that you are both intelligent, useful citizens. Neither of you is irresponsible or dangerous. You have enough money to afford schizophrenia for a while. Especially if the personality B dreams up things that personality A makes practical, financially advantageous use of. Ergo you need fear nothing for a few weeks."

"Ugh. Means I'll have to go out and buy another high-frequency heater. O. K., doctor. I'll lay low."

Thomas Lionel, Ph.D., M.M., awoke with a shake of his head. At once, he was out of bed. He consulted first the calendar and then the clock. The thought struck him funny. He hadn't been drinking, but the idea of looking at a calendar upon awakening might be construed as an admission that he didn't know what time of what day it was.

Or mayhap what month.

"I've been away again," he grunted.

He dressed by stages. At the trousers department, Thomas wandered out into the living room and stood over the chessboard, studying the set-up.

He removed the little sign that said:

CHECK!

and dropped it into the drawer again. He moved his king aside with a contemplative smile. His queen was gone on the next move, he knew. So he had lost a major piece. So that other bird thought that losing a major piece was bad, huh? Well, winning battles does not count—it is a matter of who wins the last one.

He found the volume on the theory of monomolecular films and started to read with relish. Over coffee, at breakfast, Thomas made notations on the margin of the book with a pencil; checked some of the equations and though he found them balanced properly, the author was amiss in not considering the lattice-effect in his presumptions. No monomolecular film could follow that type of reaction simply because—well, it could follow it,

but since the thing was to take place in a monomolecular film, the fission-reaction and the radiation by-products that cause the self-sustaining nature could only be effective in a plane of molecular thickness. That meant a .999999% loss, since the radiation went off spherically. Fission-reaction might take place, but it would be most ineffective. Besides, the equations should have taken that into account.

He stopped by the desk and wrote for a half hour, filling seventeen pages full of text and mathematics, explaining the error in the author's presumption.

He sealed it up and mailed it with some relish. No doubt that letter would start a fight.

He found his letter in the letter file and read it. It was a request to indulge in some basic research at a fancy figure, but Thomas was not particularly interested. He was thinking of another particular line of endeavor. He dropped the letter into the wastebasket.

He went into the lab and took a look at his cyclotronic spectrograph. There was a letter hung on the front. Thomas opened it and read:

Dear Isaac Newton:

I don't particularly mind your laying out thirty-five hundred bucks for a mass spectograph.

Appropriating my high-frequency generator didn't bother me too much.

Nor did your unsymmetrical wiring and haywire peregrinations in and about the two of them annoy (too acutely) my sense of mechanical and electrical precision.

But the idea of your using the ##&&%!! spectrograph only once—just for pre-change calibration—makes me madder than mad!

Sincerely,
Tom Lionel,
Consulting Engineer

Thomas grinned boyishly and picked up the notebook on top of the high-frequency heater. It was Tom's, and the physicist riffled through it to the last-used pages. He found considerable in the way of notes and sketches on the cyclotronic spectrograph. Cut in size by about one quarter, the thing would be not only a research instrument of value, but would be of a price low enough to make it available to schools, small laboratories, and perhaps production-lines—if Tom Lionel could find a use for a mass spectrograph on a production line.

Thomas grinned again. If it were possible, Tom would certainly have it included on *some* production line, somewhere.

He looked the spectrograph over and decided that it was a fine piece of apparatus. So it wasn't the shining piece of commercial panel and gleaming meters. The high-frequency plumbing in it had the touch of a one-thumbed plumber's apprentice after ten days' drinking and the D plates were soldered together with a heavy hand. But it did work—and that's all he cared. The knobs and dials he had added were sticking out at all angles, but they functioned.

And the line-voltage ripple present in the high-frequency generator made a particular mess out of the

spectrograph separation. But electronic heaters do not normally come luxuriously equipped with rectifiers and filters so that the generator tubes were served with pure direct current—the circuit was self-rectified which would give a raucous signal if used as a radio transmitter. That generated a ripple-varied signal for the D plates and it screwed up the dispersion. The omission of refinement satisfied Thomas. So it wasn't perfect. It would be by the time Tom Lionel got through with it.

And for the time being, Thomas would leave it alone. No use trying to make it work until Tom made an engineering model out of the physicist's experiment.

Smiling to himself, Thomas went to work in the laboratory. He ignored Tom's experiments and started a few of his own accord.

Some hours later, the doorbell rang and Thomas went to the door to find a letter, addressed to Thomas Lionel, Ph.D. It was from an Arthur Hamilton, M.D.

"Hm-m-m," said Thomas. "Is there something the matter with me?" He slit the envelope and removed a bill for consultation.

"Consultation? Consultation? What in the name of all that's unholy is he consulting a doctor about? Or is the doctor consulting —no, the bill is rendered in the wrong direction. I know my consulting engineer."

The physicist put on his hat and headed forth. It was not much later that he was sitting again in the same chair, facing Hamilton.

"You're back."

"Nope," smiled Thomas. "I'm here, not back."

"But you were here last week."

"That was another fellow. Look, Hamilton, I think I require your assistance. I have an engineer that is no end of bother."

"Want to get rid of him, huh?" answered Hamilton. The suppressed smile fought valiantly and won, and the doctor's face beamed and then he broke into laughter. "What am I, anyway? Man, I can't take money from both sides. That's . . . that's . . . barratry, or something."

"I'm the same man."

"Nope. You are not."

"Well, by and large, I thought it might be of interest to you to hear both sides. It might be that I am a useful citizen in spite of what the engineer says."

"The engineer's opinion is that no physicist is worth an unprintable."

"The physicist's opinion is that all engineers are frustrated physicists."

"Might challenge him to a fight."

"Have. But chess isn't too satisfying. I want blood."

"It's your blood."

"That's the annoying part of it all. He seems entirely a different fellow."

"The cleavage is perfect. You would think him a separate entity." Hamilton paused, "But neither of you refer to the other by name.

That indicates a psychological block that may be important evidence."

"O. K., what do we do?"

"I must discover the reason for the split personality."

"I can give you that reason. The engineer was forced into being a practical man because money lies in that direction. Upon getting out of college, there was a heavy debt. It was paid off by hard work—a habit formed and never broken. Bad habits, you know, are hard to break."

"Interesting."

"Well, the desire to delve into the physicist's realm stayed with the engineer, but people who had heavy purses were not interested in new ways to measure the ether-drift or the effect of cosmic radiation on the physical properties of carbon. Money wants more perfect pencil sharpeners, ways of automatically shelling peas, and efficient methods of de-gassing oil. All these things are merely applications in practice of phenomena that some physicist has uncovered and revealed and put on record so that some engineer can use the effect to serve his ends.

"At any rate, the desire to be a physicist is strong, strong enough to cause schizophrenia. I, Dr. Hamilton, am a living, breathing, talking example that an engineer is but a frustrated physicist. He is the troubled one—I am the stable personality. I am happy, well-adjusted, and healthy."

"I see. Yet he has his point. You, like other physicists, are not interested in making money. How, then, do you propose to live?"

"A physicist—or an engineer—can always make out well. The bank account at the last sitting was something like ninety-four thousand, six hundred seventeen dollars and thirty-four cents."

"That's quite a lot of money."

"The engineer considers it a business backlog," said Thomas. "Equipment is costly. Ergo—see?"

"I see. Seems you laid out a large sum of money for a mass spectrograph."

"I did."

"And what did he do?"

"He made notes on it and is going to peddle it as a commercial product. He'll probably make fifty thousand dollars out of it."

"I suggested that," admitted the psychiatrist.

"That's all right. I don't mind. It sort of tickles me, basically. I do things constantly that make him roar with anguish. And then his only rebuttal is to take it and make something practical out of it."

"I see."

"That, you understand, is the game that has been going on for some time between all physicists and engineers."

If you'd leave one another alone, you'd all be better off," said Hamilton. "From what I've heard, the trouble lies in the fact that physicists are not too interested in the practical details, whilst the engineer resents the physicist's insistance upon getting that last point

zero two percent of performance."

"Are you willing to give me my answer?"

"What answer?"

"How do I get rid of the engineer? One of us has got to go, and being the stable, happy one, I feel that all in all I am the best adjusted and therefore the most likely to succeed. After all, I am the ideal personality according to the other one. He'd like to be me. That's why he is, from time to time."

"Sort of a figment of your own imagination."

"That's me."

"Then I wonder— Yet, I did accept his case, not yours."

"Whose case?"

"Um . . . ah . . . I— Look, if you frustrate him to the extreme, he'll retreat into you more and more until he does not appear. Follow?"

"I get it. O. K., doctor. He'll be the most frustrated engineer in the world. And I am just the guy to do it."

Tom Lionel, Consulting Engineer, looked foolishly at the claw hammer in one hand and wondered

about it. About him in the laboratory were stacks of huge packing cases.

Unpacked already were several monstrous bits of equipment. Lionel shook his head. Where had this mess come from? He hadn't ordered it—

Or,

Had he?

Lionel left the laboratory on the dead run. He tripped once and fell flat on his face and as he started up again, the top of his head came with a sharp bang against the unyielding bottom of a ruling engine.

"A grating engine," yelled Tom.

On the desk, in plain sight, was a pile of bills-of-lading. Tom riffled through them, consulted packing lists, and a catalog of ordered equipment. In his own handwriting, too.

Grand total outlay $94,617.34; balance to be paid within thirty days: $16,750.00.

"Not only broke," grunted Tom, "but bleeding too."

His handwriting was his handwriting. Not a chance in the world of refuting the order, or packing the stuff up and sending it back. He was stuck with it.

But the conglomeration that Thomas had picked out. A sort of aggregation of large and small parts that would have made a small college laboratory figuratively drool at the thought; but which would only grow dust, rust, and corrosion in any manufacturing plant.

With the possible exception, of course, of a manufacturer of scientific equipment for colleges and laboratories.

What production line could make use of a ruling engine?

And if one could, could it use a micro-densitometer in the same process?

Of course, the micro-vacuum pump could be used in vacuum tube manufacture, in a pinch. Vacuum tube companies normally used large-volume pumps instead of the little super-efficient exhaustion pump that could take a few cubic centimeters down to a few millimicrons of mercury.

The electron microscope was a nice hunk of stuff, but the thing was not applicable to anything except research.

And the instantaneous X-ray gadget was tricky as the devil—and adapted mostly to the job of taking pictures of bullets under fire as they passed up through the rifling of a gun.

One pile of stuff was directed—according to Tom's designation—only at the problem of investigating the Earth's gravitational field as for strength, direction, and conflicting urges.

A transit. Now what in the name of sin would a radio engineer want with a transit? Nice piece of stuff, and far superior to the little dumpy-level that Tom used to lay out antenna arrays and directive antennas of one sort or another. But, a transit!

And so the list went. $111,367.34 worth of the most interesting, best

made, neatly assembled hunks of utterly impractical scientific machinery ever collected under one roof.

A solid vista of impracticality as far as the eye could reach.

The ton of bricks that broke the camel's back.

Tom roared through the house, took a look at the chessboard and with a savage movement, took the physicist's queen with his knight. He'd get even with that physicist if it took—

Well, almost anything.

Fifteen minutes later he was in Dr. Hamilton's office, pounding on the desk.

"Look," he roared, "that physicist just clipped me for my entire bankroll and then dropped me into debt by sixteen grand. I want him clipped!"

"Now take it easy," said the doctor. "Remember you are talking about yourself."

"Doc, if I commit suicide am I liable for murder?"

"Yup. Going to try?"

"Nope. Life is too interesting. My main regret with life is that I was born a hundred years too soon. My only compensation is that I may live to be a hundred, so that I can see what I've missed by being born too soon. Follow?"

"You sound mentally healthy enough."

"Thanks. But what about him? You've seen him."

"I have. He came to me about you."

"And what are you doing about it . . . us?"

Dr. Hamilton laughed. "Mind if I speak bluntly?"

"Not at all. I can take it."

"Then consider. Both you and your . . . physicist . . . are sensible, useful citizens. Both of you can contribute much to civilization. Both of you can and will be respectable people, for which other people will have admiration.

"I am in the middle," said the doctor. "I can be no more than a referee. I see both sides. I believe the cleavage came as a result of frustration on your part—you know the details—and as such, you become him when you are frustrated. The reason why he becomes you is also clear. Whenever he finds himself in straits due to the necessity of practical thought, the slip-over occurs. You awoke with a stripping hammer in your hand, unpacking scientific equipment that the physicist bought. He, obviously, became quite worried about the financial situation upon viewing the stuff he bought and could face it no more."

"Sounds reasonable."

"Now consider again. Neither of you is dangerous. You are both interesting and valuable to society. The only thing that is at all bothersome is the fact that you, per se, are not happy. You need an integration of personality. He needs the same. I might hope for a coalescing of you two, but at the moment—and possibly for all time—it is impossible. All I can tell you is the same thing that I told

him. Frustration to the extreme will exorcise the other personality. He tried it by running you into debt; by purchasing a laboratory full of things that you, as an engineer, can see no practical use for. You frustrated him—or tried to—by making something commercial out of his last experiment. That, unfortunately, was not frustration for him.

"You must—if you wish to freeze him out—develop something that will frustrate the physicist and still be possible to rationalize in your own personality."

"Um."

"An insolvable problem would do it—if you can shun the problem yourself."

"That might be difficult."

"Especially when the two of you are inclined to become the other when faced with a problem that does not fit in your psyche."

"The problem—I wonder."

"What do you do when you are faced with a tough or impossible problem in physics?"

"I don't get 'em, usually."

"Well, supposing some company required a casting of tungsten metal, for instance."

"I'd ask that they show me exactly why the tungsten couldn't be formed in another manner."

"Supposing they demanded that it be cast?"

"There isn't anything on God's green earth that could be used to handle molten tungsten. Tungsten metal can be shaped, forged, machined, or cold-rolled. But you can't cast it. Ergo, if I were offered that problem I'd merely ask why they needed it. If they require a tungsten shape, I'd recommend shaping or machining, for instance, depending upon how the shape is. If they merely want a tungsten casting for the sake of wanting a tungsten casting, I'd laugh at them and tell 'em it was impossible as I close the door behind them."

"And your physicist?"

"He wouldn't even consider it. To him, no real problem exists. He'd have no truck with a production department in the first place, and in the second, shaping metals isn't particularly of interest to a physicist, excepting when the shape itself is important. And then he doesn't give a howling hoot how it gets in that shape as long as it is shaped properly."

"Well, as I see it, you must evolve something that will frustrate the physicist while holding his interest. He must be compelled to consider this insolvable problem by sheer interest alone. It also must be something that you can see no interest in save as a problem for him, otherwise you may find yourself biting your mutual fingernails over your own devilish plan."

"Um—that's a large order."

"That's it," said Hamilton. "And in the meantime, I'd suggest that you tinker around with some of the stuff you bought. It will lessen the shock of your problem of the bankroll."

"That bank of junk might be the means to his own frustration," grinned Tom. "Every time I look

at it, I get a feeling of what can be done about it that is practical, and that may force him into existence and keep him there."

"Well, good luck. And remember, I am just a sort of referee. One of you will become the stronger. One will succeed. I can hope for coalescence, but I doubt that it will take place. Lacking that, all I can hope for is that eventually you will become reintegrated and that the lesser personality will be frozen out."

Tom Lionel returned home, thinking furiously.

"May the best man win, huh?"

It was seven solid weeks by the calendar. Seven solid weeks of hard, backbreaking work during which everything went fine and dandy for Tom Lionel, Consulting Engineer.

The balance of his debt was paid off when Americal Electric purchased the rights and royalties of the cyclotronic spectrograph. The equipment in Tom's laboratory had been kept in good shape, polished and even used occasionally. It was all connected for operation, and though the laboratory had changed from a spacious building into a place where aisles and areas abounded between banks of equipment, it did make an impressive sight.

Even the transit came into use.

And then at the end of the seventh week, Tom Lionel looked at his notebook and started to consider in all of its aspects the rather improbable phenomenon recorded there. He not only let it prey on his mind; he stopped hourly and invited his mind to consider the evidence. At first his mind rejected it on the basis that science was not equipped to consider it, and then as the evidence seemed definite and leading, his mind accepted the fact that this problem did exist and that it was a real and utterly baffling problem.

Then his mind rejected it on the basis of impracticality. It would be nice—but.

No known physical effect could possibly explain it in a satisfactory manner.

Tom went to sleep.

And Thomas Lionel, Ph.D., M.M., awoke. His first consideration was the chessboard. It baffled him. He didn't really think that the engineer would capture his queen. It was too easy. Obviously, there was more to the set-up than appeared. For offering the trap of the double-check and subsequent loss of his queen, Thomas had opened the row blocked by the knight. That left him in the desirable position of capturing the engineer's rook, after which if the engineer was not more than careful in his counterattack, he would find himself staring a checkmate in the face. Either the engineer was blind to the trap, or he had a more complicated trap to spring once the physicist started to move in.

He had time. He wanted to consider the whole thing. He was

going to be darned sure that he was right before he moved.

He dressed slowly, and as he entered his kitchenette to prepare breakfast, he saw a new notebook on the table. He picked it up, riffled the pages first, and then read the lettering on the front page.

PHYSICAL DATA AND OBSERVATIONS MADE ON THE OCCURRENCE OF THE MANIPULATION OF NATURAL FORCES WHICH HAVE NO EXPLANATION IN THE KNOWN REALM OF PHYSICS.

Contents:

173 pages of text.
77 pages of calculations.
48 tables of figures.
67 photographs.
13 statements made by unbiased—but not trained—observers.
7 similar incidents not given scientific attention.
29 graphs and curves
25 pages of description and data pertaining to:
- meteorological conditions.
- terran constants — gravity and magnetism.
- sunspot activity.
- chemical analyses of earth at discreet intervals near the occurrence.
- analysis of atmosphere during phenomena.

Accompanying information and data are samples of earth mentioned above. Atmospheric samples were contaminated during analysis and have therefore been destroyed.

"Little Tommy has been a busy lad," mused the physicist. "'No explanation' huh? That's a laugh. *Anything* can be explained. Well, my engineering friend, let's see what you have cooked up for me."

Thomas Lionel started to read the "173 pages of text" and got down as far as the bottom of the first page. He blinked, did a double take, and reread it.

"Great howling entropy," he grunted. "The unmitigated screwball has spent weeks in the compilation of data on his own, personal observations of a *poltergeist* in action!"

Thomas took the cigarette case from his pocket and extracted a cigarette. He snapped the lighter and was amazed to see the colors on the case. They were scintillating, iridescent, and beautiful. They danced and changed as he moved the lighter, and the swift play of color across the surface of the case caught his fancy.

It also caught his scientific sense. He looked at the case carefully and swore. Tom had been using the ruling engine. The surface of the cigarette case was a mirror-grating and it was as good a job as the ruling engine could produce.

Thomas fumed. The idea! And then he smiled a bit. For the engineer's use of the ruling engine to decorate a cigarette case was a sort of prostitution of the machine, but it had not harmed the engine in any way. And it was certainly no worse on the physicist's nerves than the irrelevant mixture of precision and utter sloppiness that characterized the physicist's work.

It was, the physicist admitted, beautiful.

He returned to the engineering data.

A poltergeist!

The "throwing-ghost" of the ancient lore and myth. The fearsome manifestation of unrealism. Superstition!

Sheer superstition!

The physicist's mind rejected it, at first. But that which made him the physicist prodded neatly and patiently and quietly. "Where there's smoke, there's fire," it said. And it mentioned situations where, though exact engineering data had not been taken, certainly the observers were not incompetent. They were not trained, but they did attempt to give a valid picture.

Well, so there might be something to it. So the poltergeist might be something.

This case was no flash in the pan. It was real and valid. For nine full days it had persisted. For nine full days, stones passed through the air at the direction of —the poltergeist. Pictures of the stones in full flight. A step-by-step, frame-by-frame sequence picture of a stone leaving the ground and speeding away gave Thomas a wriggly feeling up and down his spine.

Barometric pressure 29.77 inches, temperature 84.66 degrees, both rising slightly. A graph gave the pressure and temperature throughout the nine days. The total number of stones and the masses, individual and aggregate. The district, with a map of both the entire township and a close-up map-diagram of the area, with motion-traces across it, each labeled, notated, numbered, and keyed to the text.

Physical data on the gravitational field. Maps of the magnetic field, both transverse and vertical. Wind direction during each passage of the stones.

A faked report.

Couldn't be real. Absolutely impossible. Ridiculous, and the work of a frantic mind, working avidly to create a situation.

And yet the engineer was a good engineer. He couldn't—it was psychologically impossible for him —to present fake data.

Ergo this report must be real.

Thomas considered the reports of peculiar activity. Mostly the newspapers reported them as small boys throwing stones as a method of exerting their ability to be annoying to the police and duly constituted authority.

There were reports, he knew. About twelve authentic reports per year, which considering the possibility of having the poltergeist phenomena present when no observer was there—how many times had he heard small stones rattling from the roof or rattling noises of one sort or another—meant that the poltergeist was a rather common phenomenon. There were cases he recalled wherein earthquake temblor had been blamed for the upsetting of a grand piano. He'd wondered about that one—a grand piano is stable, positionwise —and how it could have been rolled across the room and dumped upside down.

Poltergeist phenomena.

Ah yes. It might be advisable to get slightly soused tonight. But Thomas was a physicist. He did not quail or get slightly panicky at the idea of the unknown, even though the unknown was known to have tossed a slab of marble—appropriately, a tombstone—several hundred feet through a caretaker's shed.

To be sure, it was slightly running against the grain to sit there in the broad daylight and read about things that according to all physics from Archimedes to Einstein claimed impossible, racial superstition, and old wives' tales. It was very disquieting to read of stones—dead, inert, lifeless, immobile bits of granite—that took off from Mother Earth with no visible means of support, to go whizzing through the thin daylight air at speeds that raised bruises, cut nicks in trees, and shattered windows. It bothered the sense of propriety. It was not right. It was like seeing Lake Louise in violent flame, or watching Niagara go tumbling up from the whirling pools to the ledge that flanked Goat Island. It was crushing chrome-vanadium test-bars between your fingers just after removal from a tensile strength machine that failed to fracture them at fifteen thousand pounds per square inch. It was watching phosphorus lying inert in an atmosphere of pure oxygen.

It was all wrong.

And yet, thought the physicist, what must the Ancient One have thought when he considered the act of fire melting hard metal? They did strange things, in those days. They invented phlogiston, and spent centuries trying to isolate it. Galileo and his telescope, looking through it to Jupiter, must have been startled at the concept as well as the sight of a planetary system in operation.

Science knew that the poltergeist was a problem—but like the man who does not care to go crazy because of the insoluble problem, science shrugged, admitted that it was stumped—intelligently enough, under the circumstances—and then remarked that after finding the next decimal place, it would, perhaps, take a look into the natural phenomena of things that were thrown by nothing.

Until that date, it could look the other way and claim that small boys were throwing stones.

Little boys that they could not see.

Little green men—

Uh-huh, well, here before Thomas Lionel was a veritable wealth of intelligent observations and data on the complete operation, including evidence to substantiate the fact that neither small boys or little green men were involved.

The evidence and engineering measurements were made with impersonal directness. The engineer, recognizing that he knew nothing of the cause, recorded the effect with court-stenographic impartiality. A stone of so many grams left point

A in a rising parabola and proceeded to point B where it landed and rolled to point C. It took X seconds, attained Y velocity at peak, and covered Z feet. Graph 1 represents acceleration and deceleration, and equation XXVII is the mathematical representation of the space-curve described by this stone of so many grams.

And bottle VQ contained the stone.

It was all wrong, but it was interesting. It pointed the way to madness—and unless it could be rationalized, the pathway to madness would be a one-way street. Thomas knew at that point that his feet were on that path. He could never retreat until he carried back with him an answer—and from the data presented, his answer must be right.

The engineer, he knew, had done it deliberately. As a means of frustration it was more than airright. It was perfect. Show a physicist something that floats between two plates, and he'll go crazy until he knows why. And the engineer had shown the physicist any number of things that floated—sped, indeed—through the air between heaven and earth, like Mohammed's coffin.

Without the benefit of mirrors.

Well, Thomas Lionel, are you licked?

He found a letter that removed all doubt as to the reason. He opened it and read:

Dear Archimedes:

Since you so gallantly presented me with this aggregation of things to measure the last three decimal places of everything, I have decided to put it to work. I have had some fun, thanks to you, in measuring things that I believe have never been set to music before. I have spent some time collecting and presenting data.

This data I do not pretend to understand. I don't intend to try. I am merely an impartial observer. To harness this power would be a boon to civilization. I can see a small truck full of equipment bearing the sign:

POLTERGEIST MOVING COMPANY

if you can only unravel the information contained in my data. You, as a physicist, surely must be able to explain the manifestation in terms that satisfy all and sundry. Once you decide what makes, I'll be interested. Until that date I am stumped, admit it, and happy that I am able to hand the problem to one who by all the evidence, has the personality and character that will not permit these pages of painstaking data to molder in the dust.

Please—old fellow, tell me what's with a poltergeist.

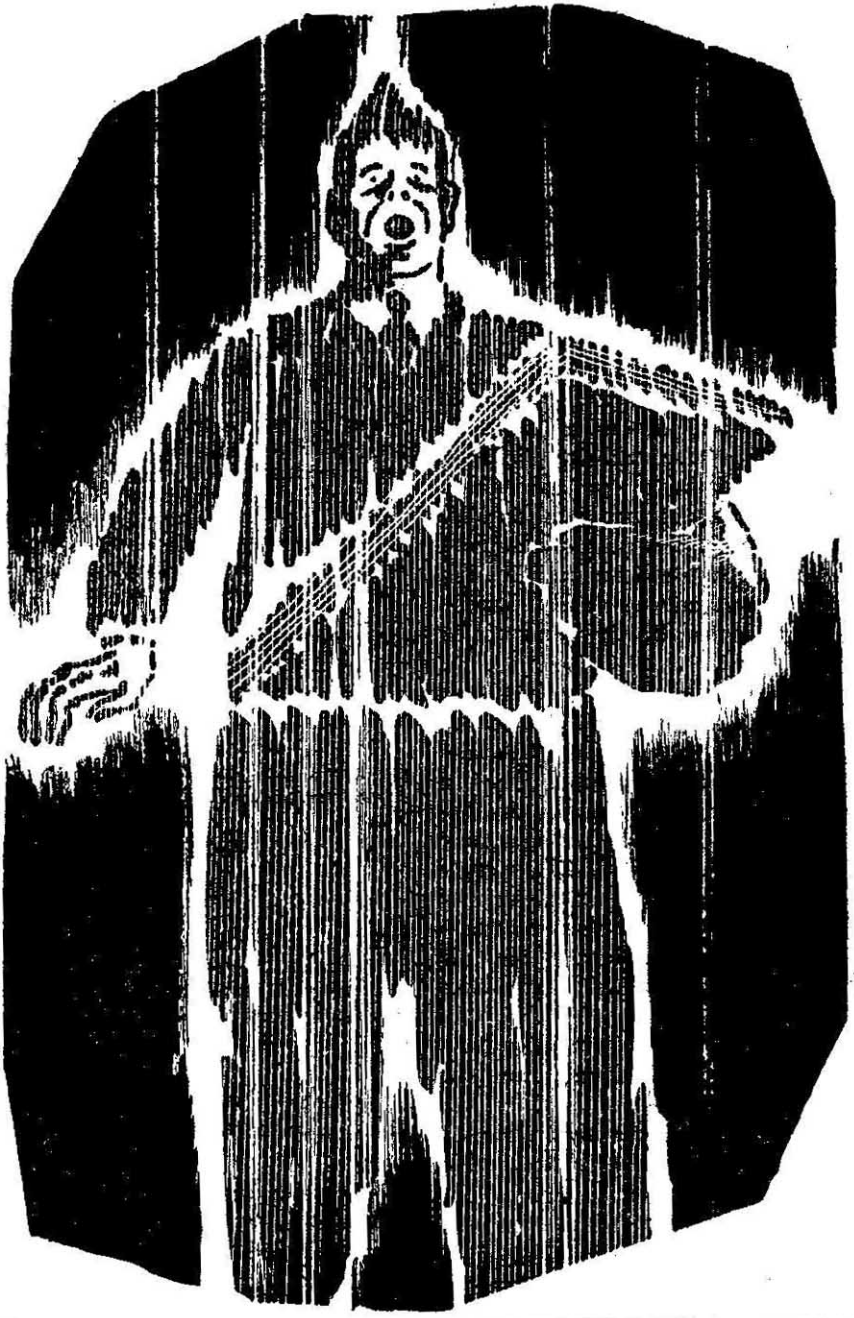
And don't refer vaguely to space warps or fourth dimensional animals. That's strictly for *Corny Stories* or *Vulturesome Tales.*

Interestedly,
Tom Lionel,
Consulting Engineer.

P.S. That junk you bought made it possible to make these measurements. Surely the same stuff should enable you to figure out the answer. You and your monomolecular films.

You and your monomolecular films, Thomas snorted.

That was the start. Then, for eight solid weeks, the laboratory lights burned by night, and the machinery turned at all and odd



hours of the clock. Measurements were conducted on all sorts of things; including at one instance, the astronomical data pertaining to planetary line-up of the solar system. That one was stamped with a large reject sign; not only it didn't apply, but it didn't make sense either. Trips to the library were frequent, and many's the ancient tome that Thomas read until his eyes burned.

The equations, graphs, and tabulations came in for their study and he located a percentage of dispersion in them. It was either experimental error or true dispersion of effect.

The engineer had done his work well. He had compiled his information, and then had presented it in such a manner that left no doubt. And it proved conclusively that something was there and at the same time pointed out that if there was something there, it could be analyzed, and possibly reproduced.

The physicist knew that no answer would be satisfactory until the phenomenon could be reproduced.

And both he and the engineer knew that the chances were more than possible that a high-order physical effect might be the basic cause. An effect for which mankind had no instruments; Radio as a natural phenomenon would be inexplicable to a race that had never discovered a means of detection; the mathematical prediction of radio occurred years before the original experiments.

So—

The physicist set his mind against frustration. To change over to the engineer without an answer would be an admission of defeat. At least without *some* satisfactory answer.

He mulled his problem by the hour, by the day, and by the week. He did take enough time out to consider the chess problem daily. He figured all the possible moves and finally, one night, he smiled, shrugged his shoulders and decided to plunge ahead.

He slid his rook down from one king row to the other through the square formerly covered by the knight which had been protected by a bishop. All the way across the board he went, and as he arrived at his opponent's king row, he took out the little sign and stood it on the center of the board.

Tom Lionel blinked and removed his finger from the pushbutton. He shook his head. This was all wrong. And, besides, what in the name of entropy was this little box? He didn't recall putting a finger on that button—but here he was, removing his hand after holding the button down.

It was a small metal box about eight by seven by four inches. The edges were all die-straight and the surfaces were as optically flat as Tom could determine without testing. The pushbutton was set flush with the surface, and made of the same metal as the box.

No other projection was evident.

But the button was accompanied

with engraving cut in the metal of the front surface. It said:

BE AN ENGINEER!

Away with imagination! Be practical! Dispense with theory! Do nothing that cannot be justified and explained to perfection.

To succed; to enjoy the wonderful practicality of the engineer—
PRESS HERE!
Poltergeist Conversion Co., Ltd.

Tom blinked and got the idea at once. The engineer knew. The physicist had dreamed up this thing; it must contain some sort of thing that caused the shift in personality at the physicist's will.

He took hold of it and lifted.

It slipped out of his fingers.

He set both hands on it and lifted. It stayed on the table. He grunted and strained, and succeeded in getting it off the table by several inches. Then he gave up and returned it slowly to the top again, fearing to drop it lest it damage the desk top.

Metal, huh?

Must be practically solid, then.

What metal?

Tom thought. Must be tougher than a battleship's nose, for if entry were easy, the physicist knew he'd be rebuilding the thing every time he wanted to use it.

He took a cold chisel, set the edge against one corner and walloped it with a hammer. The edge of the cold chisel turned back in a neat Vee. Tom took a file, set the cutting edge against one corner and filed. The file slipped across the corner of the box with all the bite of a solid, slick bar of smooth steel.

An atomic hydrogen cutting torch stood nearby. Tom fired up and set the ultra-hot flame against the same corner that had defied his previous efforts. Nothing much happened excepting that the box got hotter.

That spoiled Tom's fun for the moment. The desk below the box started to smoke and then burst into flame. Tom grabbed a carbon tetrachloride extinguisher but stopped before he played the stream on the hot metal. It was charring the desk through.

The desk was ruined anyway, so Tom ignored it for the moment. He ran a bucket of water and slid it underneath the desk just in time to catch the ultra-hot box just as it passed through the table.

While it was sizzling in the bucket of water and sending forth great clouds of vapor, Tom busied himself with the extinguisher, putting out the fire on the desk.

Tungsten!

Well, tungsten or not, it must be ruined after immersion in water after being red-hot all over. Nothing on God's green earth—

Holy entropy! He'd said that before. It presented a couple of large, bright red question marks.

One. That thing was apparently tungsten clear through. Therefore, how had the physicist cast it?

Two. Granted that thing had been cast—what in the name of howling rockets had the physicist used for the inside circuits?

And three. If running molten tungsten into the mold hadn't ruined the guts of the box, how could heat and water do anything at all?

And, disquieting thought, was the pushbutton waterproof?

With much difficulty, Tom moved the box out from its watery bath below the bench and hauled it over to the high-power X-ray machine. He looked at the fluoroscope and grunted in disgust.

Naturally, tungsten would be completely and utterly blank-faced to any X-ray manipulation. He wanted to kick it, but he knew that kicking a solid slab of tungsten would be damaging only to the kickee.

A means of casting tungsten—something that they'd been seeking ever since the stuff was isolated. He had it—or at least, the physicist had it.

Utter frustration.

Thomas Lionel looked at the box and grinned. He knew what had happened. The engineer hadn't been able to guess—

He pressed the button again—

Tom Lionel removed his finger from the button and swore. He used an engineer's ability to remember and then to improvise, and from there he took up the job of invention. His swearing did him good. At least he forgot to

worry about the tungsten box. He'd find that one out eventually, anyway.

And, furthermore, its trial by fire and water had damaged it in absolutely no way.

Q.E.D., here he was again!

He looked further. It was not like the physicist to just do this. There must be other information pertaining to the problem that the engineer had left. He went into the living room of his house and sought the desk. There was more of it, anyway.

The title page of the manuscript read:

MATHEMATICAL ANALYSIS OF OBSERVATIONAL DATA MADE DURING THE MANIFESTATION OF FORCES OPERATING IN A NEW FIELD OF PHYSICAL SCIENCE.

By Thomas Lionel, Ph.D., M.M.
Consulting Engineer.

Tom lifted the manuscript from the desk—

And he got the squeamish feeling of being dropped in an ultra-high speed elevator that was accelerating at a terrific rate. He instinctively dropped the manuscript and clutched the edge of the desk. When the manuscript hit the desk, it caused the phenomenon to stop.

Tom felt the top page, ran around it with his fingers, and then carefully slid his hand beneath the last page, found the button on the desk top, and held it down while he removed the manuscript.

He lifted. It gave him the screaming willies, and instinctively, Tom pressed hard on the button.

His elevator changed direction. It gave him the effect of being hit on the head with a sand bag. It was now accelerating upward at a violent rate.

He let the button up slowly. The feeling ceased as he reached a pressure about even to the weight of the manuscript; stopping all at once. He compensated by dropping an equal number of blank pages from the desk on the button and took the manuscript to his easy chair to read.

It was one of those things. It couldn't be denied. He was going to be *forced* into presenting this paper before the American Physical Society, using his full name and all of his degrees and the works. The physicist and his little tungsten box would see to it that he remained an engineer until the paper was presented, fully and completely. The physicist didn't have all the answers, of course, but he had solved some of the basic problems.

He finished the manuscript, and then found a letter. It said:

Dear Galileo:

The phenomenon of losing fifty pounds is the result of an antigravity field which I discovered from your data on the good old poltergeist. The trouble with the thing is simply this:

In order to make the thing function, it takes something like three tons of equipment to make the object within the field lose its fifty pounds.

I, as a physicist, do not care about the practicality of the device. I have made it

work. You, as an engineer, will appreciate the possibilities behind the perfection of this device. I offer you the chance to start your Poltergeist Moving Company, providing, of course, that you can make something of this effect.

Incidentally, I have been unable to get or to predict antigravitational forces of less than fifty pounds regardless of how the equipment is set up.

I don't care, I will leave the rest to you.

Sincerely,
Thomas Lionel, Ph.D., M.M.

Tungsten casting, antigravity, inefficiency and poltergeists! Tom's head whirled. With a last-hope gesture, he stalked over to the chessboard and studied the men.

It bothered him, he was completely frustrated. The room whirled a bit, despite Tom's fight against it. This was the last straw, this chess game.

Not that he himself was the absolute loser in this game of living chess. It was just that he had started something that threatened to boil over at the edges.

Fundamentally, he'd tried to exorcise the physicist. He'd gone to much trouble and effort to remove the low-down effect of physicist-thinking patterns from his immediate locale. Instead—by his supreme efforts to get rid of the theorist, aforementioned theorist had come up with a few problems of his own that tickled the imagination, offered all sorts of interesting problems, and—

Had basically shown how utterly impossibly foolish it would be to try and get rid of the physicist.

Thomas Lionel, PhD., M.M., knew too much to be immediately removed, obliterated, canceled, or even ignored.

How do you cast tungsten? How do you make antigravity—even on an inefficient scale? And if a poltergeist is—and you know his address, as the physicist seemed to, can you hire the throwing-ghost? Brother, did he have a lot of problems to reduce to practice! He'd have little time for getting rid of his pal.

Tom Lionel snarled at the chessboard. He'd made his gambit, and instead of ridding himself of a rather powerful threat to his own security, he'd—well, he reread the significant sign that presided over the chessboard and began to growl like an insulted cocker spaniel.

The sign said:

CHECKMATE!

THE END.