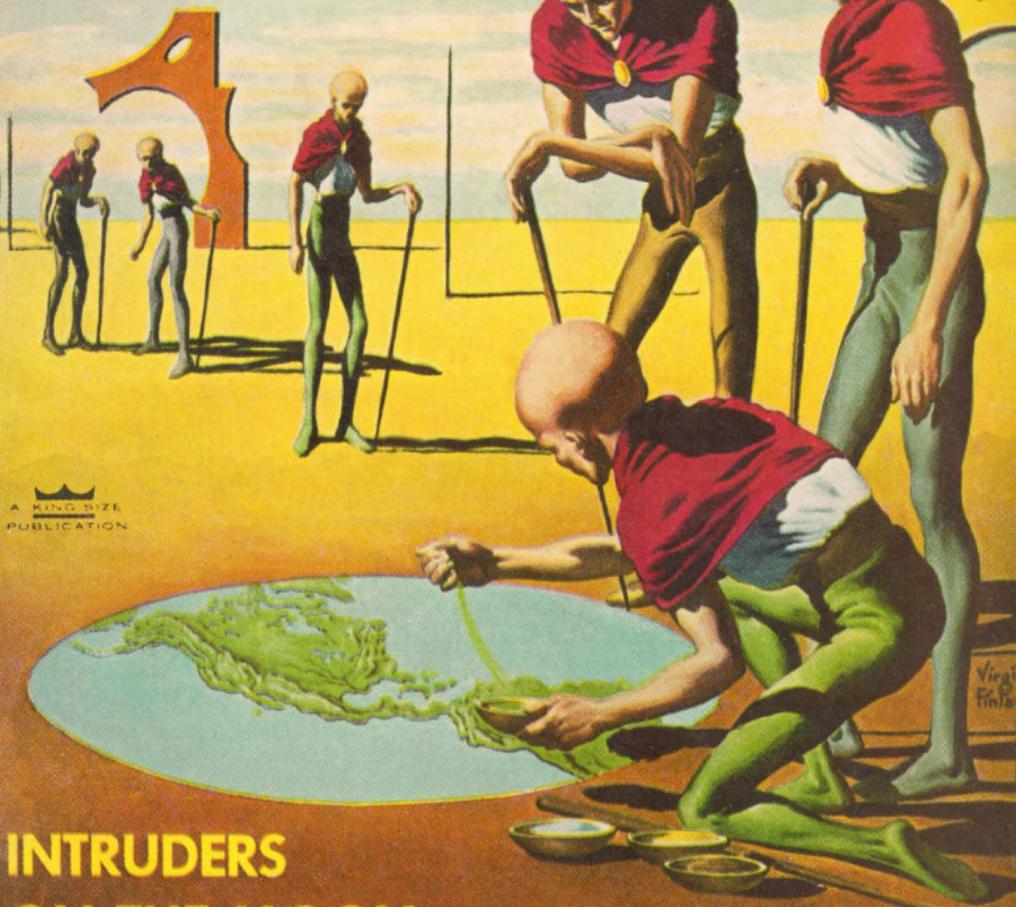


# FANTASTIC UNIVERSE

SCIENCE FICTION

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**INTRUDERS  
ON THE MOON**  
An Adventure Novelet  
By EDMUND COOPER

**PFUI ON PSI**  
A Challenging Article  
By L. SPRAGUE DE CAMP

**pfui**

**on**

**psi**

*by . . L. SPRAGUE de CAMP*

About every ten strokes, the friction between my fingers and the paper rose markedly for two-three strokes, as if . .

Perhaps you have been perturbed by statements in SF magazines about psionic effects, or direct effects of mind on matter outside the brain. These statements appear not only in articles, editorials, and book-reviews. They assume that the reality of psionic effects has been proved; that they are based on incontestible "facts"; and that if you don't agree, you're a barnacled old reactionary of the kind who persecuted Galileo and sneered at Columbus.

The reason for your discomfort is that, even if you haven't studied the matter, you feel in a vague way that, if psionic effects are real, something must be wrong with all the rest of science. Telekinesis and precognition, to take the most egregious examples, defy logical, plausible explanation.

Well, cheer up. Whatever is wrong with science-as-it-now stands, you need not believe in psionics to keep your franchise as a sane, sensible, scientifically-minded man.

Between the realms of magic and science lies a shadowy borderland where dwell

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*L. Sprague de Camp, author of LOST CONTINENTS (Gnome Press) and other works, explores a question of considerable interest to SF readers in this provocative article on Psionics. Are psionic effects "facts" that cannot be gainsaid and Psionics the key to understanding the forces around us? Is criticism permissible — or rank heresy?*

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explorers, exiles, and spies from both. Here magicians pose as scientists, scientists act like magicians, and scientists try to investigate magic scientifically.

One region they explore is the old concept of a mind that acts outside the body, either on another mind or on material things. The idea of such mental action is as old as magic and religion. Gods and spirits have always been thought of as disembodied or disembodiable minds with powers of clairvoyance (seeing through opaque obstacles), telepathy (speaking by direct mind-to-mind contact), telekinesis (moving material things by mental force), and precognition (prophecy). Tribal priests and magicians have also claimed to exercise these powers with the help of gods and spirits. An idea so firmly held for so long by so many is not readily given up.

A century ago appeared a class of magicians called spiritualist mediums. These, too, claimed clairvoyance, telepathy, and the rest. Most claimed to exercise these powers by the help of spirits of the dead.

Soon after, some academic people, first in Britain and then elsewhere, began to examine these claims. The first organized group of these psionicists. (as we may call them) was the British Society for Psychological Research, founded 1882.

Early mediums flaunted telekinetic powers—noises, object-throwing, table-tipping, horn-blowing, slate-writing and levitation. This is called physical mediumship, as contrasted with mental mediumship — clairvoyance, telepathy, and precognition. As the researchers got more skilled, they found that whenever they put a medium under rigorous control, either the medium was caught faking, or the effects stopped, or the medium refused to go on.

Many people wrote books asserting that certain mediums had proved that these powers did indeed exist. An author often chose a single medium, sometimes averring that this subject was the only genuine medium ever observed.

A study of the enormous literature\* on this subject, shows that none of these mediums has a clear record. Those who were never caught in fakery, like Stainton Moses, never worked under close control. It is said that the Schneider brothers produced real effects—but Willi Schneider stopped making magic when the SPR put him under close control. His brother Rudi created effects under close control for the SPR in 1929-31—but then he

\* For an introduction to this literature, see the notes in *Science*, No. 3165 (26 Aug. 1955) p. 367.

was photographed cheating. Mina Crandon, "Margery the Medium," won many adherents in Boston—but she was seen faking, and years later one of her confederates gave the story of the plot to the newspapers.

As a result of these failures by physical mediums, interest shifted towards mental mediumship, and most of the respectable research is done by professors like Rhine in America and Soal in Britain, outside the Societies of Physical Research. The SPR's have largely degenerated into mere spiritualist clubs, devoted to protecting mediums from exposure rather than to exposing them. For instance, when the editor of the American SPR's journal printed the news of Margery's exposure, the pro-Margery officers of the Society promptly fired him.

All science-fiction readers have heard of psi-powers. This term was coined by Dr. Joseph Banks Rhine of Duke University, leader of the American psionics. The term includes extra-sensory perception (clairvoyance, telepathy, and precognition) and what Rhine calls psychokinesis (the telekinesis of other writers). The psionic concept has become a standard prop of science fiction along with the blaster and the hyper-drive. Rhine has gathered a mass of statistics which, he says,

powers are erratic and decline have such powers, though the powers are erratic and decline with use.

This study is called parapsychology or psionics. Some science-fiction people, not satisfied with using this concept in stories, assert that these powers have now been proved real once and for all.

A leading SF personality, John W. Campbell Jr., investigates machines that react to psionic forces. He started with a gadget for analyzing minerals by their "eloptic radiation," patented by T. G. Hieronymous. (See *Astounding SF*, June, 1956.) The radiations are picked up by a tuned electrical circuit. They are collected in an electrode, radiated through a slit and a glass prism, collected by another electrode, amplified, and detected by the observer's stroking a plastic plate with his fingers.

So far the device looks like Goldbergian nonsense. Campbell says he does not believe Hieronymous' eloptic theory. This is not surprising. "Eloptic" comes from a rare Greek word *elops* or *ellops*. This is either an adjective meaning "mute" or a noun meaning "fish." "Eloptic" thus seems to mean "fishy," and this contraction looks fishy if anything ever did.

Campbell, however, claims one can still get feelings in one's finger by stroking the

plate. The effect is real, he says; it is only the explanation that's wrong. The true explanation is the presence of psionic forces. To demonstrate, he has persuaded a lot of people to stroke the plate and say that the plate felt sticky or greasy at some point when the tuning-knob was turned.

Then Campbell got rid of the pseudo-electrical gadgetry and substituted a drawing of an equivalent electrical circuit, mounted inside the original housing of the Hieronymous machine. Where the original device had a three pentode amplifier, Campbell put a symbol for a single pentode in his diagram. Still people felt the plate turn sticky or greasy. It is not surprising that an imaginary device should give imaginary results.

What should we believe about these claims? Anybody may believe what he likes, but what is the logical, rational, scientific attitude?

From time to time, men announce they have found a new science. They set up a branch of research, or a school of thought, or a cult, centered around this discovery. Sometimes, as with the heliocentric theory of the solar system, they are right. Sometimes, as with astrology, they are wrong.

When these revelations appear, how do you tell right

from wrong? There is *no* sure, simple way. The best test is to repeat all the experiments yourself, but this is often impractical.

Failing that, you can to some extent judge the claims of the new school from internal evidence. This may not always lead you to the right conclusions, but it may be the best you can do. Thus, if the leader shows the stigmata of the quack (egomania etc.) the chances are against his being right. On the other hand, you cannot infer that, because the leader seems honest, earnest, and intelligent, his theory is right. The history of science is strewn with the wrecks of wrong ideas put forth by honest, intelligent men.

Two other ways of judging a theory are to ask whether its phenomena can be objectively recorded and reproduced, and whether its results seem to add up, to make sense, to fit together into a logical, consistent scheme.

Do the alleged psionic phenomena qualify on either count? No. They are admittedly sporadic and fugitive. Some investigators report fantastic runs in card-guessing experiments, like the feat of a young man named Pearce who correctly guessed all twenty-five cards in a Zener pack while sitting in an automobile with Rhine. (A Zener pack is a pack of thick cards with five cards of each of five designs: a circle, ■

square, a star, a cross, and a set of wavy lines.) Others get no results whatever. The phenomena cannot be produced on demand. Parapsychologists admit this; but there are other phenomena, like ball lightning, of which the same can be said. Still, if we cannot have our psionics when we want it, one reason for believing in it disappears.

Well then, do the results make sense? No, not if by "sense" you mean that they fit into the rest of the well-established body of science.

For instance, when we try to think of psionic powers, we think first of radiation. But psionics does not work like any known radiation. It does not seem affected by distance. It pays no attention to shielding. It has an incredible selectivity, so a clairvoyant can "read" a Zener card in the middle of the deck without confusing it with the adjacent cards. A telepath "speaks" with another hundreds of miles away, unaffected by the mental broadcasts of millions of other minds within the same radius. It ignores the position of the target; that is, whether a Zener card is facing the seer or edge-on to him.

All other human faculties have bodily structures to account for them; not so with psionics. Ordinarily human faculties get sharper with practice, but psionics does the reverse.

Some researchers claim to

have proved telekinesis and precognition. If telekinesis be true, how can the mind shoot out a pair of psychic tweezers to grab a die in mid-flight and bring it down the desired side up? As for precognition, suppose the subject foresees that a certain card will be on top after the pack is shuffled. Then if the experimenter *doesn't* shuffle the pack, where is the future event that the subject "saw through time"?

Dr. Rhine says: forget radiations and psychic tweezers. They are false analogies from the materialistic, "physicalistic" view of the universe. This view is wrong. The real universe is something spiritual.

But this is explaining one unknown by another unknown. The principle to apply is that of Laplace: "The weight of the evidence should be proportional to the strangeness of the facts." Thus if a man who has been in Africa says he saw a herd of elephants in Africa, I do not require much corroboration. But if he says he saw a herd of elephants in the Adirondack Mountains, I demand strong evidence and lots of corroboration before I believe him.

Likewise, when somebody's claims about mental powers involve turning everything that science has learned upside down and inside out, the evidence ought to be frightfully strong. It ought to be as

strong, say, as if a geographer asserted that the world was not round after all, but flat, as Wilbur Voliva always maintained.

The same objections apply *a fortiori* to the Hieronymous machines. Here the gadget not only fails to make sense. It not only fails to give consistent results. It does not give any objective results at all. We stroke the box and tell how our fingers feel. This is the rankest subjectivism. The human sensory system is not built for exact scientific measurements and is notoriously bad at it.

As Campbell says, in any new science you have to use such crude methods of detection at first, because the right kinds of meters have not been invented. On the other hand, subjective feelings have led investigators wildly astray. They led Reichenbach into "odic rays," Baraduc and Kilmer into "auras," and others into other blind alleys. While such methods may have to be used *faute de mieux*, a man's saying he sees or feels something that others do not is not in itself proof that there is anything there.

Psionicists try to flatten opposition by repeating over and over that certain things are "facts." But calling something a fact does not make it one. Lots of "facts" put forward to support psionics are at least doubtful.

For instance, in the 1880's, researchers tested the clairvoyant powers of the young daughters of a British clergyman named Creery. In time the Creery girls were caught cheating by spoken codes.

Well, three psionicists mention the Creery children in their writings. Harry Price says simply they cheated. G. N. M Tyrrell blandly states that the girls got results far beyond chance but says nothing about their exposure. Rhine mentions the fraud by whitewashes the little hoaxers on the ground that "it is a poor kind of cheating which grows worse by practice." This is an illogical objection, for, while the girls might become more skillful fakers with practice, the investigators would become sharper detectives.

So, you see, your idea of the "facts" depends on which book you read.

Campbell has cited as examples of telekinesis, the self-levitation of D.D. Home and the table-raising of Eusapia Paladino. What happened? Home never worked under rigid control. He did his levitation-act in almost total darkness, without control, before a trio of enthusiastic friends who later wrote contradictory accounts of the event.

Signora Paladino was caught at a seance in New York in 1910. Two physics researchers (rather unsport-

ingly) dressed in black to be invisible in the darkened room. They crawled under Eusapia's table and found her tossing the table about with the muscular toes of one large bare foot. She was also caught in England when examiners relaxed precautions and suddenly tightened them when she had become overconfident. Her main trick was to persuade her inquisitors they were in contact with both her feet or hands when they were only touching one, while she did her act with the free member. When control was tightened so that this simple trick became impossible, either she got angrily excited and refused to go on, or nothing happened at all. This is an old story in psychic research.

After Eusapia's exposure. European savants went on testing her on the naive ground that, although she did cheat, she also made real phenomena. They thought themselves so clever at detecting legerdemain that if they didn't see it it did not exist.

So much for "facts." How, then, can psionic results be explained? The first possibility is, of course, that psionists have really found ways by which minds can work directly on things outside their bodies. This idea meets enormous difficulties when we try to fit it into what we already know about the universe.

As Campbell has said, what is needed is not just a set of alleged facts, inexplicable by any known science. What is needed is a theory, even a wrong one to connect the facts up and make sense of them. And, though intelligent people have been working on this problem for nearly a century, no such theory has come up. As things stand, I find it easier to believe in elves than in the powers claimed for psionics.

Science has gone through this sort of thing before. Alleged facts that could not be explained have come up. Sometimes they were found to be true facts, and a rational explanation was at length devised. Thus fossils puzzled scientists for two thousand years before they agreed that they were relics of former life-forms. But in phrenology and numerology, the facts turned out to be fictions and the explanations never did make sense. Unless and until a logical theory can be devised and confirmed by more facts, the chances are heavily against the mind-acting-on-matter idea.

What are the other possible explanations? They are error, fraud, and self-deception.

Some of Rhine's critics have said his probability-mathematics are wrong, but some at least of these criticisms are unsound. Some obscuring subjects for further

tests, on the ground that this would bias the results. This objection is invalid as long as Rhine either reports *all* the results, both of high-scoring and of low-scoring subjects, or reports only the results from high-scoring subjects and these only *after* they have been selected, omitting the preliminary tests by which these champions were chosen. If you flip ten pennies ten times each, you cannot, by selecting the penny that came down "heads" most often, count on getting more heads than tails from that penny thereafter-unless the penny has a permanent bias towards heads.

Critics also object that the Zener cards tend to fall into "patterns" which the subjects could learn. The fallacy that random events fall into predictable patterns is what makes gamblers lose their shirts trying to beat roulette-wheels by "systems".

On the other hand, as Bridgman points out, mere failure of a series of events to follow a chance or random pattern, as in the case of Zener-card guessing, is not, by itself, positive evidence for speculative hypothesis like the existence of an unknown mental faculty, especially when the nonchance event does not occur in any regular, repeatable, predictable way.

Some critics cry "fraud." George R. Price's celebrated

piece in *Science* for 26 August, 1955, "Science and the Supernatural," implied this charge, on the ground that it is easier to believe that men lie than that all the rest of science is mistaken. Rhine and Soal were indignant.\*

However, as Price remarked, he had not accused them personally of fakery. To produce statistical biases, *all* members of a group of researchers need not conspire to commit a fraud. One or two will do. Fraud does occur in science, and an air of rectitude is no guarantee against it. Charles Dawson's respectability did not stop him from perpetrating the Piltdown and other hoaxes. Harry Price, leading British psychic researcher for half a century, was found by the British SPR to have faked many of the effects he claimed to observe.

The ideal conditions for scientific fraud seem to be an unwary, enthusiastic experimenter and a less scrupulous assistant who fudges the results. The fakery may be done for any of many reasons: fame, fortune, fanaticism, or just fun. When, sixty years ago, Henri Moissan was trying to make synthetic diamonds, an assistant got so bored with doing the same lengthly experiment over and

\**Science*, No. 3184 (6 Jan. 1956).

over that he slipped some bits of industrial diamond into the mixture to please the old man and end the runs. Moisan died thinking he had made diamonds, and the truth did not come out until later.

Could something like this be the case at Duke? Well, people who know Rhine tell me he is so noble and idealistic that he assumes everybody else to be as honest as himself, and so loveable that nobody who saw him being hornswoggled would disclose the fact for fear of hurting him. Oliver Lodge and Conan Doyle were men of this kind and were mercilessly hoaxed by mediums.

Moreover, Rhine prefers as helpers undergraduates of the jolly, extroverted, enthusiastic, salesmanlike type rather than dour analytical skeptics. He thus picks the kind most likely to hoax him.

Nor is Rhine's own attitude objective. Because he thinks psionics will help mankind by restoring "spiritual" values, he is keenly enthusiastic when a subject does a good run and bitterly disappointed when one does not. He says so himself.

Of course, if Rhine were a coolly objective man who did not care how his results came out so long as they were accurate, he would probably not feel strongly enough about psionics to have done his experiments at all. This is an

old dilemma of science. The aggressive enthusiast is the man most likely to get results but also the man most likely to go on wild-goose chases.

Then there is self-deception, which can take many forms. It can be refusal to notice unfavorable evidence or dishonesty on the part of one's associates. All of us have this tendency, and when strongly developed it has led many high-minded intellectuals down weird garden paths of pseudo-science.

Self-deception can be a tendency to make biased errors. ESP tests have been run at Yale and the results recorded both mechanically, by a movie-camera, and by the usual method of calling out the names of cards and writing them down. When results were compared, it was found that those who believed in ESP consistently erred in favor of ESP, while those who did not made mistakes in the opposite direction.

The answer to this problem is to record all results mechanically. Leading psionics, however, show a suspicious aversion to mechanical recordings. They say they are too expensive.

There are interesting possibilities, yet unexplored, in unconscious fraud. If, for instance, the psionist has a split personality, the submerged part of the personality might fake results with-

out the dominant part's knowledge. Moreover, human memory is extremely tricky. People so readily forget real events that they want to forget, and remember things that never happened but which they wish had happened, that no observations about matters on which people feel strongly can be taken as gospel.

Nor can subjective reactions to the feel of a plastic plate be taken seriously. I have my own idea about these changes in feel. While writing this, it occurred to me that if feeling varies when you stroke a meaningless machine, perhaps it varies if you stroke anything. Nearby lay a copy of *Time* for 5 November, 1956, bearing on its cover the face of a political personality. I stroked his face (an act with no political significance). Sure enough, the sensation began to vary after fifteen to thirty strokes. About every ten strokes, the friction between my fingers and the paper rose markedly for two or three strokes.

After I had gone through this routine several times, the

obvious explanation struck me. My arm was getting tired so that I was bearing down harder. When the contact got so strong that the magazine began to slide about, I put more effort into holding up my arm, and the contact again became light and slippery.

In conclusion, I have no objection to psionic research. The more the merrier, even if it only proves that psionic effects do not exist.

Nor do I mind stories about psionics if written in moderation (which they haven't been lately) and if well done. I have written stories about Atlantis, time-travel, and parallel universes though I do not believe in any of them.

But I do object to declarations that psionics has now been safely proved, that psionic effects are "facts" that cannot be gainsaid, and that if you doubt these "facts" you are a benighted old reactionary who would have burnt Galileo and scoffed at Columbus if you had a chance. It hasn't, they aren't, and you're not.

