Andrew May

Pseudoscience and Science Fiction

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Introduction

Any large bookstore today will have a shelf labelled "Science Fiction". The term hardly needs explaining. It encompasses any work of fiction that stretches the reader's imagination beyond the current limits of science: extrasensory perception, time-slips, space aliens, faster-than-light travel and other dimensions. Yet elsewhere in the same store, there is likely to be another shelf with a selection of *non-fiction* books on exactly the same subjects. How this shelf is labelled—"Paranormal" or "Alternative Beliefs" or "Unexplained Phenomena"—will vary from store to store. It will rarely be labelled "Pseudoscience" . . . but that is exactly what it is.

The prefix "pseudo-" comes from a Greek word meaning false. "Science" itself comes from the Latin for knowledge, but the defining feature of modern science is the *method* by which this knowledge is arrived at. Pseudoscience is "false science", not because its assertions are false (although they often are), but because they are arrived at by a non-scientific method.

Real science can be thought of as a four-step process:

1. Pose a question
2. Formulate a hypothesis to answer that question
3. Analyse the hypothesis to determine its testable consequences
4. Carry out the tests, and accept/modify/reject the hypothesis accordingly

Pseudoscience is only really concerned with the first two of these steps. It is all about making hypotheses, not putting them to the test. In fact, pseudoscientific hypotheses are often constructed so as to be *untestable*—and hence incapable of disproof.

Science and pseudoscience may address the same questions, but they approach them in completely different ways. For a scientist, the aim is to get as close to the truth as possible—even if that truth is not an appealing or easily understandable one. For this reason, science can often come across as overly complex, boring and irrelevant to the non-scientist. Pseudoscience, on the other hand, is largely geared towards telling people what they want to hear.

As a specific example, consider the question of life on other planets. Most people would agree this is an exciting question, and there is a branch of science called astrobiology that deals with it. Unfortunately, it is not a question that can be answered by direct observation, even with the most powerful telescopes. The best astrobiologists can do is to determine the most extreme conditions under which life (usually in microscopic form) can survive on Earth and then search for similar environments on other planets. This may strike the non-specialist as a disappointingly dull answer to what started out as an exciting question.

A pseudoscientific approach to the same question might be as follows. Start from the "exciting" premise that extraterrestrials are intelligent humanoids, similar to ourselves but technologically more advanced by several centuries. They visit Earth frequently, but their technology allows them to remain virtually undetectable and to tamper with the perceptions and memories of any inadvertent witnesses. The aliens may even be conspiring with Earth governments to conceal their existence from the public. Not only is this hypothesis more appealing than anything real science has to offer, but it is literally impossible to disprove. In terms of audience appeal, pseudoscience beats mainstream science hands down.

The term pseudoscience is a pejorative, and many of the people who use it—usually professional scientists—denigrate it as "bad science". This misses the point that there is no significant overlap between the "consumers" of pseudoscience and those of real science. The latter is an essentially practical discipline: its main role is as an enabler of technological advancement. In contrast, pseudoscience is a creative undertaking—effectively a branch of the entertainment industry. Its end users *read books* . . . and for a book to be successful, it needs to say something large swathes of the public want to read. Pseudoscience is much better than real science at giving the audience what it wants.

People *want to believe* there is intelligent, anthropomorphic life elsewhere in the universe. They *want to believe* in strange powers and mysterious events. They *want to believe* there is a meaningful pattern behind today's headlines—even if that pattern is a sinister government conspiracy.

The phrase "I want to believe" was popularized in the 1990s by the TV series *The X-Files*. While much traditional science fiction is set on other planets, or in the far future, *The X-Files* was rooted firmly in its own present. Yet it managed to deal with all the major SF tropes—time travel, aliens, ESP and antigravity—and it dealt with them in the here and now. That is essentially what pseudoscience does—except that it is presented as "fact" rather than fiction.

Besides its overlapping subject matter, pseudoscience resembles science fiction in other ways. Both are products of the imagination, and both are aimed at a broad, general readership. The most obvious difference is one of purpose. Most science fiction writers only want to tell a good story, not to make a didactic point. If they do set out to make a point, they are more likely to satirize some aspect of present-day politics than—to give a common example from the world of pseudoscience—highlight a flaw in Einstein's theory of relativity.

Fiction writers may draw on popular pseudoscientific theories to add verisimilitude to their stories. The best-selling novelist Dan Brown is a master of this technique. More surprisingly, the process sometimes works the other way around, with pseudoscience taking its cue from science fiction. The symbiotic relationship between ufology and Hollywood is a prime example of this.

A number of SF authors also produced non-fiction works about pseudoscience. Some of them, like John Sladek and John Brunner, took a deeply sceptical view, while people like Arthur C. Clarke and Lionel Fanthorpe approached the subject in a more open-minded way. At the other extreme, writers like John W. Campbell and Whitley Strieber, who started their careers in fiction, went on to become outspoken advocates of pseudoscientific topics.

For the most part, this book takes a non-judgmental attitude to the pseudoscientific topics it deals with. Whether they are right or wrong is irrelevant to the book's main purpose, which is to highlight some of the more interesting examples of cross-fertilization between pseudoscience and science fiction.

The first person to make a systematic study of anomalous phenomena was Charles Fort. His writings coincided with the emergence of science fiction as a distinct genre in the 1920s and 30s, and Fort's influence on early SF writers was huge. This is the subject of the first chapter, "Charles Fort and the Forteans". The next chapter, "Anomalous Phenomena", discusses a number of Fortean phenomena that have crossed the boundaries between fact and fiction, including the Philadelphia Experiment and the Bermuda Triangle.

The "High-Tech Paranoia" chapter examines the blurring of fact and fiction in the bizarrely paranoid worlds of writers like Richard Shaver and Philip K. Dick. It is followed by a chapter on UFOs—and the intriguing two-way interaction between fact and fiction that has continued from the first "flying saucer" sightings of the 1940s to the present day.

Between them, the next two chapters span some of the most ubiquitous topics of both pseudoscience and science fiction: ESP and other powers of the mind in "Mind Power", followed by a range of physics-defying hardware—

space drives, antigravity and perpetual motion machines—in "Space Drives and Anti-gravity".

A speculative idea that has cropped up time and again over the last hundred years, both in fiction and non-fiction, is that of ancient technology—whether of human or extraterrestrial origin. This is examined in "Technology of the Ancients". To round the book off, the final chapter on "Conspiracy Theories" ventures into the ever-popular realm of conspiracy theories—including the strange notion of "predictive programming", whereby science fiction itself is used as a medium for the indoctrination of an unsuspecting public.

Charles Fort and the Forteans

Abstract Characterized by science fiction author Damon Knight as the "Prophet of the Unexplained", Charles Fort was the first person to make a systematic study of anomalous phenomena. During the 1920s and early 30s, Fort collected masses of data that he believed had been deliberately excluded—or "damned", to use his own word—by the scientific establishment. This was the very period when science fiction was emerging as a distinct genre in the pulp magazines, and Fort's ideas were every bit as "amazing" and "astounding" as anything those magazines had to offer. As a result, he became required reading—and essential source material—for a generation of SF authors.

Pulp Fiction

Long before the days of blockbuster movies, comics and video games, there were pulp magazines. The name comes from the fact that they were printed on cheap wood-pulp paper, as opposed to the glossy paper associated with more upmarket magazines. The pulps were cheap and plentiful, and they specialized in exciting, easy-to-read genre fiction with a mass appeal. It was in this context that science fiction, as a clearly defined genre of its own, made its debut in the 1920s. The scope of the new genre was potentially huge. As pulp historian and SF author Ron Goulart put it:

> Science fiction could accommodate planet-hopping adventure, satiric thoughts about the future, trips through time to the past. Spacemen and monstrous aliens, fragile princesses, mad scientists, absent-minded professors and dedicated researchers. Hymns in praise of technology and dire warnings about the perils of the machine. Utopia and anti-utopia. Hard science, pseudoscience and crackpot science. [1]

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All these things had existed before, but they had never been grouped under a convenient all-embracing label. An early SF fan, Alva Rogers, explained how the name came about:

> The term "science fiction", it might be noted here, was first used by Hugo Gernsback in the first issue of *Science Wonder Stories* [June 1929]. As near as can be determined this was the first time this particular combination ever saw print anywhere in any magazine. Until then the most popular term used to describe the literature was "scientifiction", a word coined by Gernsback in 1925 and originally intended as the title for what became *Amazing Stories*. Scientifiction in turn was a contraction of "scientific fiction", which was used extensively by Gernsback during the early twenties to describe the stories he ran as a regular feature in his magazine *Science and Invention*. [2]

Hugo Gernsback is often described as the "father of science fiction". The Hugo awards, handed out each year at the World Science Fiction Convention, are named in his honour. Born in Luxembourg in 1884, Gernsback emigrated to America in 1904. He developed an interest in amateur radio and electronics—cutting edge technology at the time—and founded one of the first magazines on the subject, *Modern Electrics*, in 1908.

Innovatively, Gernsback included fictional stories as well as factual articles in the magazine. Over the course of 12 issues in 1911–12, he serialized his own first novel, *Ralph 124C 41+*, set in the year 2660. As Gernsback explained in the original foreword to the novel: "It is intended to give the reader as accurate a prophecy of the future as is consistent with the present marvellous growth of science" [3]. In retrospect, Gernsback's prophecies can be seen as a mixture of valid technological extrapolation—television, videophones, driverless vehicles, solar power, spaceflight—and outright pseudoscience, such as telepathic writing, invisibility and antigravity.

In 1913 Gernsback brought out his second magazine, *The Electrical Experimenter*, which later changed its title to *Science and Invention*. It followed the same formula as *Modern Electrics*, mixing popular science and fiction. The big change came in April 1926, with the debut of *Amazing Stories* (see Fig. 1)—a magazine devoted entirely to "scientifiction", as Gernsback explained in his editorial in the first issue:

> *Amazing Stories* is a new kind of fiction magazine! It is entirely new—entirely different—something that has never been done before in this country. Therefore, *Amazing Stories* deserves your attention and interest.
> There is the usual fiction magazine, the love story and the sex-appeal type of magazine, the adventure type, and so on, but a magazine of "Scientifiction" is a pioneer in its field in America.

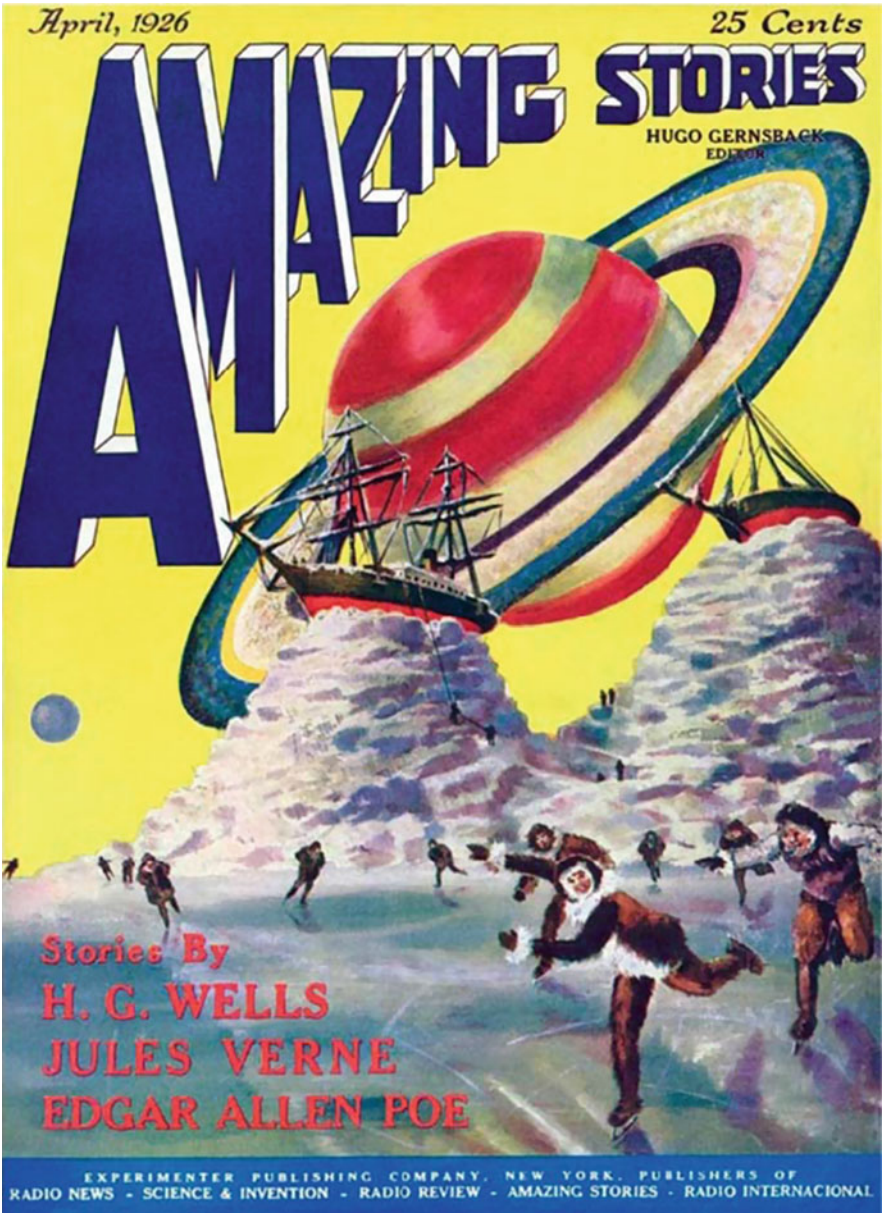

Fig. 1 The first issue of *Amazing Stories*, April 1926 (public domain image)

> By "scientifiction" I mean the Jules Verne, H. G. Wells, and Edgar Allan Poe type of story—a charming romance intermingled with scientific fact and prophetic vision. [4]

That first issue of *Amazing Stories* contained reprints of works by all three writers mentioned by Gernsback—Poe, Verne and Wells—as well as several

other authors. One of the newer stories to be featured was "The Thing from Outside" by George Allan England, which had originally appeared in Gernsback's *Science and Invention* in April 1923.

"The Thing from Outside" is far from being "a charming romance intermingled with scientific fact and prophetic vision". It's a tale of fear, paranoia and contradictory perceptions. Strange footprints appear on barely accessible rock ledges. There are hints of a sinister, invisible visitor from interstellar space or the fourth dimension:

> "I tell you," insisted Jandron, "there are forms of life as superior to us as we are to ants. We can't see 'em. No ant ever saw a man. And did any ant ever form the least conception of a man? These Things have left thousands of traces, all over the world. ... Charles Fort, the greatest authority in the world on unexplained phenomena, gives innumerable cases of happenings that science can't explain, in his *Book of the Damned*. He claims this earth was once a no-man's land where all kinds of Things explored and colonized and fought for possession. And he says that now everybody's warned off, except the Owners. I happen to remember a few sentences of his: "In the past, inhabitants of a host of worlds have dropped here, hopped here, wafted here, sailed, flown, motored, walked here; have come singly, have come in enormous numbers; have visited for hunting, trading, mining. They have been unable to stay here, have made colonies here, have been lost here." [5]

This was not the first time that extraterrestrial creatures had appeared in a work of fiction. What set England's story apart—and presaged a whole new sub-genre of pseudo-factual fiction—was its reference to Charles Fort: a real person, still living at the time the story appeared.

Who Was Charles Fort?

Charles Hoy Fort (see Fig. 2) was born in 1874 in Albany, New York. His writing career began with fiction—a stream of novels and short stories, most of which went unpublished and are now lost. One of the first people to appreciate Fort's writing was Theodore Dreiser—a novelist himself, and the editor of *Smith's Magazine*, which published a number of Fort's early short stories. These were followed by Fort's only published novel, *The Outcast Manufacturers*, which appeared in 1909.

The focus of Fort's interest gradually turned to science, which he viewed with an increasingly hostile attitude. The books he read dated from the last decade of the 19th century, and the first decade of the 20th—a period when scientists were particularly arrogant about "knowing everything". Fort could see that this was patently untrue. He channelled his accumulated scepticism

Fig. 2 Charles Fort in 1920 (public domain image)

into two more novels, known only by the single-letter titles *X* and *Y*. His biographer Damon Knight—a science fiction writer himself—put these in the following context:

> Because he believed there were, in science, only believers and cranks, and because he would not be a believer, he became a crank. . . . He wrote a crank book of his own, and called it *X*. Then he wrote another, and called it *Y*. Neither was ever published, and the manuscripts, like nearly all Fort's manuscripts, were destroyed; but we still have the letters he wrote Dreiser about them.
> *X* was organized around the notion that our civilization is invisibly controlled by beings from the planet Mars. . . . In *Y*, Fort imagined another sinister civilization a little closer at hand—at the South Pole. [6]

Dreiser liked both *X* and *Y*, and tried his best to find a publisher for them—ultimately without success. Disillusioned with fiction, Fort's next book—still on a resolutely anti-science theme—was non-fiction. He called it *The Book of the Damned*, and explained the title at some length in the first chapter:

> By the damned, I mean the excluded.
> We shall have a procession of data that Science has excluded.
> [. . .]
> Anything that tries to establish itself as a real, or positive, or absolute system, government, organization, self, soul, entity, individuality, can so attempt only by drawing a line about itself, or about the inclusions that constitute itself, and damning or excluding, or breaking away from, all other "things".
> [. . .]
> In this book, I assemble some of the data that I think are of the falsely and arbitrarily excluded.
> The data of the damned.

> I have gone into the outer darkness of scientific and philosophical transactions and proceedings, ultra-respectable, but covered with the dust of disregard. I have descended into journalism. I have come back with the quasi-souls of lost data.
> [. . .]
> We are not realists. We are not idealists. We are intermediatists—that nothing is real, but that nothing is unreal: that all phenomena are approximations one way or the other between realness and unrealness. [7]

Unlike Fort's novels, *The Book of the Damned* gave Dreiser little trouble finding a publisher, and it duly appeared in 1919. The world had never seen a book quite like this one before, either in terms of its style—which verged on the avant-garde—or its content. A new word, "Fortean", had to be coined to describe its scope. Drawing on news reports from around the world, Fort described things that were not supposed to happen—but seemingly did. Frogs and fish fell from clear skies. Strange lights appeared in the night sky—things that had no right to be there. It would be another 30 years before the term "unidentified flying object" was coined, but in effect that was what Fort was talking about.

The direct quote in England's story—"inhabitants of a host of worlds have dropped here"—comes from Chapter 12 of the *Book of the Damned*. The same chapter contains one of Fort's most famous speculations, which is as chilling today as it was in 1919:

> I think we're property.
> I should say we belong to something:
> That once upon a time, this earth was No-man's Land, that other worlds explored and colonized here, and fought among themselves for possession, but that now it's owned by something:
> That something owns this earth—all others warned off. [8]

Fort's "data" consisted for the most part of newspaper snippets—over the years he recorded and catalogued thousands of them. Much of his research was carried out in the New York Public Library. There was far too much to fit in one book, and in 1923 *The Book of the Damned* was followed by a sequel, *New Lands*.

Between 1924 and 1926 Fort lived in the Bloomsbury area of London, continuing his research at the British Museum. It was during this period that his ideas were first presented to a wider public. In a series of letters to the *New York Times*, he suggested that sightings of strange lights and other objects in the sky might be attributable to surveillance by an extraterrestrial intelligence [9].

After his return to America, Fort published two more books—*Lo!* in 1931 and *Wild Talents* in 1932. He only just lived to see the latter in print, dying that same year at the age of just 57.

As the title suggests, *Wild Talents* dealt with reports of purported psychic abilities, such as telepathy, telekinesis, dowsing and clairvoyance. It also covered other supernatural topics—such as poltergeists, werewolves and witchcraft—which Fort considered to be part and parcel of the same basic phenomenon.

Another "wild talent"—near-instantaneous teleportation from one place to another—forms one of the major themes of *Lo!* In fact, the very word "teleportation" was first coined in that book. To Fort, teleportation was a psychic phenomenon analogous to telepathy or telekinesis, by which a person is suddenly transported from one place to another by paranormal means. In some cases this may be a voluntary act ("Maybe for ages the secret of it has been known by esoteric ones," Fort says at one point [10]), but in others it may be spontaneous and unbidden. The entire first half of *Lo!* deals with possible examples of teleportation, ranging from mysterious appearances—such as that of Kaspar Hauser in Nuremburg in 1828—to equally mysterious disappearances, such as the loss of the crew of the Mary Celeste in 1872.

No-one can deny that Charles Fort did the world a great service in drawing attention to the vast number of anomalous reports that are conveniently overlooked by mainstream science. On the other hand, he made a number of egregious errors that have become all too common in the world of pseudoscience:

- He made no attempt to investigate the validity of the cases he cited, as long as they supported the point he was trying to make. If he had done so, a significant number of them (especially those from small local newspapers) would have turned out to be the misperceptions of unreliable witnesses, or even editorial fabrications on a "slow news day".
- Fort used anomalous events—whether or not they stood up to close scrutiny—as springboards for wild speculations of his own. This merely serves to explain one improbable mystery in terms of another, equally improbable, mystery.
- Possibly because he was taught science in a very didactic, dogmatic way, Fort totally misunderstood the scientific method. He had no conception of testability, falsifiability or quantitative prediction, and assumed that scientific theories had no firmer grounding than his own speculations.

For all his failings, Fort was never dogmatic about his assertions—a fact that sets him well above the majority of pseudoscientists. He espoused what might

be called a relativist view of knowledge: "I conceive of nothing, in religion, science, or philosophy, that is more than the proper thing to wear, for a while" [11].

Neither did he take himself too seriously: "I believe nothing of my own that I have ever written. I cannot accept that the products of minds are subject-matter for beliefs" [12]. In *Wild Talents* he went even further:

> This book is fiction in the sense that *Pickwick Papers*, and *The Adventures of Sherlock Holmes*, and *Uncle Tom's Cabin*; Newton's *Principia*, Darwin's *Origin of Species*, *Genesis*, *Gulliver's Travels*, and mathematical theorems, and every history of the United States, and all other histories, are fictions. A library-myth that irritates me most is the classification of books under "fiction" and "non-fiction". [13]

This blurring of Fortean fact and fiction continued after his death, when his book *Lo!* was serialized in a science fiction magazine in 1934. The magazine in question, *Astounding Stories*, had first appeared in January 1930 as a copycat rival to *Amazing Stories*. In October 1933 *Astounding* moved upmarket when it was acquired by the prestigious (by pulp standards) Street & Smith company. The magazine paid higher rates than its rivals, and began to print better quality fiction. *Astounding*'s new editor, F. Orlin Tremaine, put the focus firmly on scientific ideas rather than adventure.

One of Tremaine's innovations was to run factual articles. To quote Arthur C. Clarke: "Whether *Ranch Romances*, *Western Love Stories* et al. ever printed thoughtful essays on land ownership, cattle branding . . . and similar relevant subjects, I have no idea; but somehow I doubt it" [14].

Lo! ran over eight issues between April and November 1934 (see Fig. 3). As Clarke went on to say: "No choice could have been more appropriate for a science fiction magazine, and Fort's writing was to have an immense influence on the field" [15].

Lo! had appeared in book form three years earlier, but in *Astounding* it was able to reach a much larger audience. To quote SF historian Sam Moskowitz: "*Astounding Stories* had at that time a circulation between 45,000 and 50,000. In three printings, *Lo!* had reached an audience approximating 3,000" [16].

In his editorial blurb preceding the first instalment, Tremaine emphasized the work's significance for readers and writers of science fiction:

> Here is the most astounding collation of factual data ever offered to a large audience. This book has been read by three thousand people—mostly writers seeking plots! We offer it to the one group in America which can digest it. [17]

The link between Charles Fort and science fiction was well and truly forged.

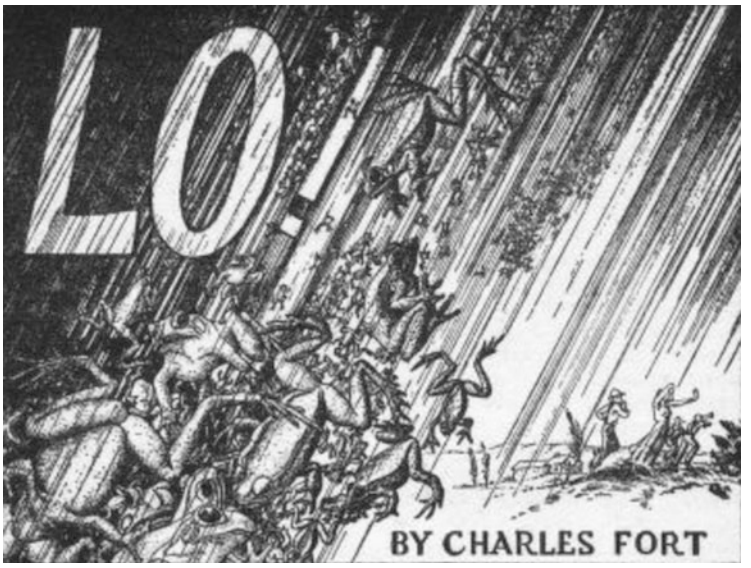

Fig. 3 Illustration for the serialized version of *Lo*! in *Astounding Stories* (public domain image)

Fortean Fiction

From the start, Fort's work appealed to writers of fiction. Indeed, the very term "Fortean" was coined by a young author named Ben Hecht, who later became a prolific Hollywood screenwriter. In his review of *Book of the Damned* he wrote: "I am the first disciple of Charles Fort. … Henceforth I am a Fortean" [18].

A year before Fort died, the Fortean Society was founded by New York based author Tiffany Thayer. Its purpose was "to perpetuate the name of Charles Fort and promote the reading of his books; to preserve Fort's notes and papers; to continue the work of gathering Fortean data; and to encourage dissent" [19].

Early members of the society included several fiction writers. As well as Ben Hecht there was Theodore Dreiser, who had helped Fort find his first publisher, and such literary figures of the time as John Cowper Powys, Dorothy Parker, Booth Tarkington and H. L. Mencken.

In his last years, Fort corresponded with at least two young SF writers: Edmond Hamilton and Miriam Allen deFord. The latter was name-checked in both *New Lands* ("Miriam Allen deFord has sent me an account of her own observations") and *Wild Talents* ("Clipping sent to me by Miriam Allen deFord of San Francisco"). In return, at least one of deFord's short stories mentions Fort by name. This is "Slips Take Over", which deals with spontaneous teleportation between parallel dimensions:

> Ever hear about the farmer who went to his barn to milk his cows, and the cows were found unmilked and the farmer never seen again? Or the private plane that crashed with only the owner in it, and the plane was found, but never the pilot? Or the diplomat who walked around the horses of his carriage—and vanished? Hell, Charles Fort's books are full of cases—supposing you ever heard of Charles Fort. . . . And take it another way—what about people like Kaspar Hauser, who suddenly appear—where from? [20]

That story dates from 1964, but Fort's other young correspondent—Edmond Hamilton—produced two Fortean stories during Fort's own lifetime. These are "The Space Visitors", published in *Air Wonder Stories* in March 1930, and "The Earth Owners" in *Weird Tales*, August 1931. The second of these is another "we are property" tale, owing something to George Allan England's earlier "The Thing from Outside"—a debt that Hamilton acknowledged [21].

Hamilton's first Fortean story, "The Space Visitors", took its cue from another provocative Fort quote: "I think that we're fished for" [22]. In the story, Hamilton gives this a literal interpretation: a gigantic scoop appears from nowhere, rakes up whole portions of cities, then vanishes as mysteriously as it appeared (see Fig. 4).

Another early reference to Charles Fort can be found in H. P. Lovecraft's novella "The Whisperer in Darkness", which first appeared in the August 1931 issue of *Weird Tales*. Lovecraft is usually thought of as a horror writer, but many of his later stories—this one included—dealt with mysteries of space and time that seem closer to science fiction than traditional horror.

Part of Lovecraft's genius lay in his ability to present the most outlandish concepts in a compellingly believable way. One of his favourite techniques involved liberally sprinkling his stories with references to supposedly scholarly writings. Some of these he made up himself (the infamous *Necronomicon* being a prime example), but others are real books. It is in this context that Charles Fort crops up in "The Whisperer in Darkness", when the story's narrator—initially a sceptic—starts to investigate strange sightings in rural Vermont:

> The more I laughed at such theories, the more these stubborn friends asseverated them; adding that even without the heritage of legend the recent reports were too clear, consistent, detailed, and sanely prosaic in manner of telling, to be completely ignored. Two or three fanatical extremists went so far as to hint at possible meanings in the ancient Indian tales which gave the hidden beings a non-terrestrial origin; citing the extravagant books of Charles Fort with their claims that voyagers from other worlds and outer space have often visited the earth. [23]

Fig. 4 Illustration of "The Space Visitors" by Edmond Hamilton (public domain image)

Surprisingly, Lovecraft himself was a hard-headed sceptic when it came to supposedly supernatural phenomena. While he appreciated Fort's writings as a stimulus for his fictional stories, he gave them no credence at all as non-fiction. In one of his letters he wrote:

> Fort scraped up all sorts of press anecdotes of a certain type—which in turn were typical misstatements, misinterpretations, exaggerations and distortions of actually observed things, or else hallucinations or fabrications. Track down any one of them to its reported place of occurrence and the marvel evaporates. [24]

Sinister Barrier

Eric Frank Russell was one of the first generation of SF fans in Britain. In 1934, at the age of 29, he joined the British Interplanetary Society, which was based in his home town of Liverpool. For three years he played an active role as one of the society's administrators, but dropped out when its headquarters moved to London in 1937. That same year Russell sold his first SF story to Tremaine at *Astounding* magazine.

A few years earlier, when Tremaine serialized *Lo!* in *Astounding*, Russell "read it without a glimmer of interest"—according to his biographer John Ingham. The situation soon changed, however:

> Within a couple of years, Russell had read *Lo!* again, this time in book form, and was hooked. In no time at all, he had become completely obsessed by what he described as "the peculiar genius of Charles Fort, both as a writer and as an originator of challenging ideas", remaining a staunch admirer and supporter of Fort for the rest of his life. [25]

Russell bought all of Fort's books, and began a correspondence with Tiffany Thayer at the Fortean Society in New York. He became a regular contributor to the society's magazine, started his own collection of Fortean news clippings, and eventually became the Fortean Society's British Secretary. By 1938 Russell had started work on a Fortean-inspired novel "that was destined to change not only his own life but the image of science fiction forever" [26].

The novel's eventual title was *Sinister Barrier*. It opens with an introduction in which Russell explicitly acknowledges its Fortean origins:

> Perhaps my greatest debt is to two friends, one of whom asked me, "Since everybody wants peace, why don't we get it?" while the other posed me this one, "If there are extra-terrestrial races further advanced than ourselves, why haven't they visited us already?" Charles Fort gave me what may well be the answer. He said, *"I think we're property."* And that is the plot of *Sinister Barrier*. [27]

The "we are property" theme had already been used by George Allan England in "The Thing from Outside" and by Edmond Hamilton in "The Earth Owners". Those were short stories, though. As a full-length novel, *Sinister Barrier* was much more ambitious. Russell submitted the manuscript to *Astounding*, partly because he had already had several stories published there, and also because it was the magazine that had serialized Charles Fort's own *Lo!*

Tremaine had moved on to other things in 1938, passing the editorial helm at *Astounding* to a 28-year-old physics graduate named John W. Campbell. The latter had already made something of a name for himself as a writer of science fiction. He shared Tremaine's vision of "serious" SF, with strong scientific content and original ideas. One of his first acts as editor was to changed the magazine's name from *Astounding Stories* to *Astounding Science Fiction*. Under Campbell's leadership, the magazine soon found itself at the cutting edge of speculative fiction, publishing early works by a whole new generation of writers like Isaac Asimov and Robert A. Heinlein.

When Russell sent the draft of his novel to Campbell, its title was *Forbidden Acres*. Campbell liked it, but wanted a stronger title and a more upbeat ending. The result, after considerable rewriting, was *Sinister Barrier*. Campbell made the decision to run the story, not in *Astounding*, but as the lead feature in the first issue of a new Street & Smith magazine called *Unknown*—a kind of crossover between the science fiction and weird fantasy genres. The premiere issue duly appeared in March 1939 (see Fig. 5).

The plot of *Sinister Barrier* is comparatively straightforward. *Fortean Times* editor and long-time SF fan Bob Rickard summarized it in the following terms:

> Russell's protagonist discovers (mainly by misadventure) that humans are being controlled by invisible spherical entities that hide behind a "jammed" part of the electromagnetic spectrum—the titular "sinister barrier of our limitations". These "Vitons" feast, like vampires, on humanity's suffering, much of which they cruelly engineer. Having found a way to provoke the Vitons and make them visible, our hero leads humanity's revolt against the ethereal parasites. [28]

There is more to *Sinister Barrier* than a straightforward "humans versus aliens" story, however. Its real novelty lies in its Fortean blurring of fact and fiction. In his introductory note, Russell makes the straight-faced claim that his story is essentially true, but that he has been forced to present it in the guise of fiction to avoid the risk of "removal" by the Vitons (a fate that befalls various characters in the novel who get too close to the truth):

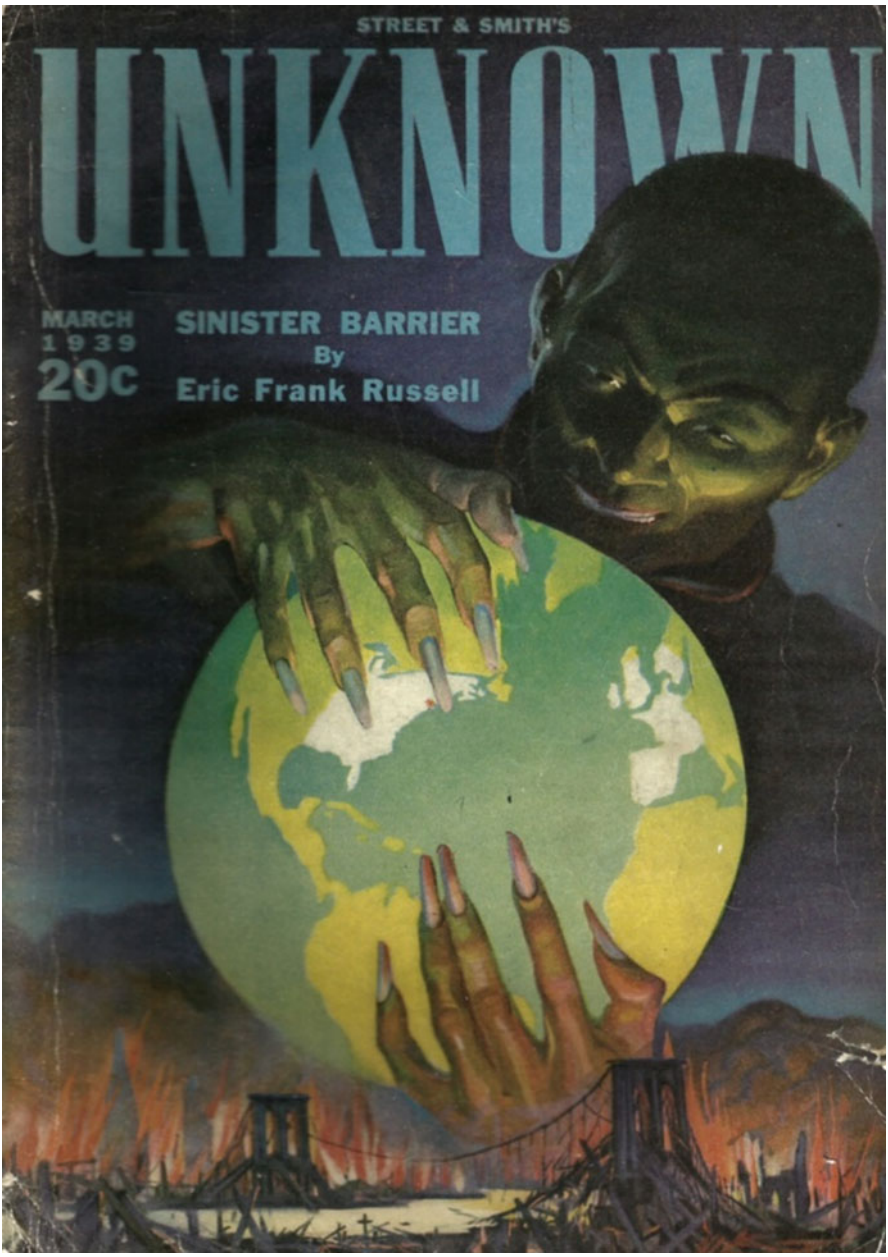

Fig. 5 The first issue of *Unknown* magazine, featuring Eric Frank Russell's *Sinister Barrier* (public domain image)

I regard it as a sort of fact-fiction solely because I do sincerely believe that if ever a story was based upon facts it is this one. *Sinister Barrier* is as true a story as it is possible to concoct while presenting believe-it-or-not truths in the guise of entertainment. It derives its fantastic atmosphere only from the queerness, the

> eccentricity, the complete inexplicability of the established facts that gave it birth. These facts are myriad. I have them in the form of a thousand press clippings snatched from half a hundred newspapers in the Old World and the New. [27]

In the magazine's editorial, Campbell plays along with this view: "The facts Russell states are facts. A man may well strike truth in what is meant as fiction" [29].

In true Fortean tradition, *Sinister Barrier* is packed with offbeat newspaper clippings. Despite the story's future setting, and in keeping with Russell's stated intention of presenting fact in the form of fiction, all these news items are perfectly real. As Russell himself says in a footnote to the novel:

> Every back-dated press item mentioned in this story is absolutely authentic, and may be inspected in the files of libraries and newspaper offices. These clippings are not fantasy but hard fact. [30]

At various points, Russell manages to work mysterious or unexplained phenomena from the "real world" into the plot. Fireballs are explained as dying Vitons. People who disappeared under mysterious circumstances, such as Amelia Earhart or the crew of the Mary Celeste, are said to have been abducted by Vitons for experimental purposes.

As soon as it was published, *Sinister Barrier* caused a sensation in the SF world. As John Ingham recounts:

> The science fiction buying public had never read anything like it. Russell's reputation as a writer, already on-the-up, was boosted higher still. At a stroke he became the superstar of late 1930s science fiction. If he had never written anything else in his lifetime, his place in science fiction history was assured. [31]

Russell's second contribution to *Unknown* was a neat complement to *Sinister Barrier*: a factual article in the style and spirit of Charles Fort himself. Called "Over the Border", it appeared in September 1939—the first non-fiction article in *Unknown*, just as *Lo*! had been *Astounding*'s first foray into non-fiction five years earlier. Russell's piece contains a catalogue of what today would be called UFO sightings—mysterious aircraft and strange lights in the sky—coupled with the (then very novel) hypothesis that such objects have an extraterrestrial origin. Campbell draws special attention to Russell's speculations in his editorial:

> In a single year, the year 1938, chosen only because it is the last full year of record, hundreds of entirely inexplicable things have happened. We don't

> know how or why; science cannot see how these unquestionable facts fit into the pattern of truth. Eric Frank Russell suggests the string that may tie these things together—the disquieting string that Earth is a stopping-off place on a regular line of interplanetary shipping, run by beings utterly alien to us. [32]

Russell became a prolific writer of novels and short stories during the 1940s and 50s, though none of his later fiction was as explicitly Fortean as *Sinister Barrier*. However, he did produce a non-fiction book called *Great World Mysteries* (1957), which contains in-depth analyses of some of Fort's best known cases—including levitation, spontaneous human combustion, the Mary Celeste, Kaspar Hauser, the "devil's footprints" that appeared overnight in Devon in 1855 (to be discussed further in the chapter on "Anomalous Phenomena") . . . and, of course, UFOs [33].

A Continuing Source of Inspiration

Referring to the books of Charles Fort, John W. Campbell commented to Eric Frank Russell that "they contained not less than one good science fiction plot per page" [34]. Another of Campbell's regular authors, Henry Kuttner, "told Russell that he was inspired by *Sinister Barrier* to look at Fort's work for ideas of his own" [35]. When Campbell reviewed a new edition of Fort's works in 1941, he observed that:

> Unquestionably, Fort's collected facts are important. Only—no one yet has been able to find out just how or why, or what they mean. They are, in other words, a perfectly magnificent source-book and challenge to writers and readers of science-fiction . . . and—if only we could find the pattern hidden there among the vast jumble of facts—it probably contains the root truths of about four new sciences. It's not all light reading, but it's a vast mine of fascinating material for either science fiction or fantasy. [36]

Campbell was merely stating the truth. Many of the things Fort wrote about have become standard SF tropes: UFOs, strange powers, mysterious happenings. SF stories frequently name-drop Fort himself, as a way of gaining vicarious credibility—a tradition that can be traced all the way from George Allan England's "The Thing from Outside" in the 1920s to the 21st century. When *The X-Files* was revived for its tenth season in 2016, one of the episodes puts the following words into the mouth of Agent Mulder:

> Charles Fort spent his entire life researching natural and scientific anomalies, which he published in four books, all of which I know by heart. [37]

Some SF authors became collectors and purveyors of Forteana in their own right. Perhaps the most famous example is Arthur C. Clarke, whose TV series *Mysterious World* (1980) and *World of Strange Powers* (1985) were Fortean in style and subject matter. British TV viewers may also remember Lionel Fanthorpe's short-lived *Fortean TV* show from 1997. Thirty or forty years earlier, Fanthorpe was a prolific writer of science fiction and fantasy (see the chapters on "Anomalous Phenomena" and "Technology of the Ancients").

While many SF writers share Charles Fort's fascination with unsolved mysteries, far fewer share his bizarrely anarchic brand of epistemology. To Fort, all theories were wrong, even his own. He rejected all science, and came up with alternatives which were often frankly preposterous—like the idea of floating islands in the sky from which mysterious objects fall, or the idea that the earth is flat (or nearly flat) and stationary in space, or that the moon and planets are only a few hundred miles away.

It is very rare for SF writers—or even pseudoscientists—to deviate from scientific orthodoxy to this extent. They may come up with wild speculations—such as timeslips, wormholes or antigravity—but these are usually rationalized in terms of a fundamentally scientific worldview.

One notable exception—and hence one of the most genuinely Fortean of all SF writers—is R. A. Lafferty. Several of his stories mention Fort by name, and the title of one of them—"Nor Limestone Islands"—is a deliberate homage to one of Fort's most outrageous ideas. The title is supposedly a quotation from an ultra-sceptical scientist's "unfolk ballad" (penned, of course, by Lafferty himself) [38]:

> I will not credit whales that fly
> Nor limestone islands in the sky

Raphael Aloysius Lafferty was a prolific contributor to SF magazines and anthologies in the 1960s and 70s. His stories were short, whimsical and surreal, and filled with bizarrely cartoonish characters. His chatty, vaguely avant-garde writing style is reminiscent of that of Fort himself. As with Fort, this surface whimsicality conceals a strongly held—and highly unorthodox—view of the world.

Like Fort, Lafferty was a relativist, believing there was no such thing as absolute truth. In his fiction, reality has a way of shifting into new configurations without anyone noticing. This is particularly evident in his short story collection *Ringing Changes* [39]. The majority of these stories tell of times in the past—often the not-very-distant past—when the laws of physics were different, or human abilities were different, or animal species were different, or time itself was different. Almost no-one is aware of this, though, because history quickly reshapes itself to cover up the changes.

The longest story in the collection, "The Rivers of Damascus", features a pair of psychically talented characters—one who can "dowse" the past in the way that other people dowse underground rivers, and another who can tune into the resulting mental impressions and turn them into solid reality. They offer their services as a "para-archaeological probe" to help academic historians research the past. Unfortunately, they tap into the wrong psychic stream, revealing a past that is completely different from the one in the history books. Ostracized by the scientific establishment, the pair are paraded before a billion-strong audience on a TV show called *Science Supreme, the End of the Crackpots*. The story has a happy ending, though, when the audience decides the entrenched academics are the true crackpots.

An even more overtly Fortean story in the same collection is titled "Oh Whatta You Do When the Well Runs Dry?" The well of the title is the Collective Unconscious: the place people get their ideas and creative inspirations from. One day it suddenly dries up—or most people think it has dried up. The Forteans, however, know better. They know the Collective Unconscious consists of countless sub-wells, and what has run dry is just the conventional-thinking one. There are plenty of others to choose from—but only if everyone in the world becomes as open-minded as the Forteans. Again, the story has a happy ending:

> You know what rough and shouting people the Forteans had always been? . . . These shabby, crude, delirious dregs of humanity had always lived on rocks in the lower skies and in shanties on the outskirts of our towns. But now we all drank their water, we thought their thoughts (thoughts? some of their ghouly notions were enough to rot the flesh off your bones), and now we became indistinguishable from them. [39]

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Anomalous Phenomena

Abstract Since Charles Fort's time, "anomalous phenomena" of the kind he specialized in—mysterious events supposedly beyond the abilities of science to explain—have continued to crop up in news reports and fringe media around the world. Such phenomena have tremendous appeal both for pseudoscientists—who can employ them as "evidence" for whatever crackpot theory they are putting forward—and for science fiction writers, who can weave their plots around them. As with Fort's own work, the line between fact and fiction often becomes blurred. This chapter examines some fictional and non-fictional treatments of anomalous phenomena—including such modern myths as the Philadelphia Experiment and the Bermuda Triangle.

Science, Pseudoscience or Science Fiction?

Charles Fort was the archetypal anti-scientist. His books list thousands of reported events that he believed were "damned" by scientists, or deliberately excluded from consideration. In fact, there is very little science can say about such cases, because the evidence—as reported in Fort's newspaper clippings—is usually anecdotal, second-hand and single-source. For science to work, it requires repeatable experiments or observations, and in the absence of these there is little that it can say. Where sufficient evidence exists to investigate Fort's cases in detail, they have a tendency to fall apart. As H. P. Lovecraft was quoted as saying in the previous chapter: "track down any one of them to its reported place of occurrence and the marvel evaporates" [1].

For pseudoscientists, on the other hand, cases like those recorded by Fort are a veritable goldmine. They can be wheeled out as evidence for any of a whole range of theories, from UFOs and alien abductions to teleportation and parallel dimensions.

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In science fiction, the situation is almost identical—with the difference that the theory in question is now just a convenient plot device, rather than a sincerely held belief. In other cases, writers may cite anomalous phenomena from Charles Fort's books, or other "real world" sources, in order to add verisimilitude to a story.

An example of this can be seen in the excerpt from Miriam Allen deFord's short story "Slips Take Over" quoted in the previous chapter. In this, she referred to "the diplomat who walked around the horses of his carriage—and vanished" [2]. This is an allusion to one of the cases Fort described in his book *Lo!*:

> Upon November 25th, 1809, Benjamin Bathurst, returning from Vienna, where, at the Court of the Emperor Francis, he had been representing the British Government, was in the small town of Perleberg, Germany. In the presence of his valet and his secretary, he was examining horses, which were to carry his coach over more of his journey back to England. Under observation, he walked around to the other side of the horses. He vanished. [3]

In deFord's story, this is "explained" using the idea that Bathurst spontaneously slipped over into a parallel timeline. A completely different "explanation" is put forward in Eric Frank Russell's novel *Sinister Barrier*, which was also discussed in "Charles Fort and the Forteans". In the novel, Russell suggests that Bathurst was abducted by aliens for the purposes of experimentation:

> Beach went imperturbably on. ". . . the man who went nowhere; the case of the disappearance of Benjamin Bathurst, British ambassador extraordinary to Vienna, who, on November 25, 1809, walked around the heads of a couple of horses—and vanished forever."
> "I don't quite see the connection," Graham protested. "Why the devil should these super-creatures make people disappear?"
> "Why do medical students make stray cats disappear?" [4]

These are just passing references, designed to give a false air of authority to the fictional concept being purveyed. At the other extreme, the Bathurst case can be used as the springboard for an entire story. The best known example of this is H. Beam Piper's "He Walked Around the Horses", which was originally printed in *Astounding Science Fiction* in April 1948. As in deFord's later story, Bathurst accidentally slips into a parallel time stream—but in this case the action focuses exclusively on Bathurst's fate.

"He Walked Around the Horses" was the first of several stories Piper wrote around the concept of parallel timelines, which he referred to as "Paratime". The second story, "Police Operation", appeared in *Astounding* three months after the first. This second instalment introduced the Paratime Police, whose

Fig. 1 Illustration from H. Beam Piper's story "Police Operation" (public domain image)

role was to cover up such inter-dimensional slips as and when they occurred. The story opens with a quotation from Charles Fort:

> . . . there may be something in the nature of an occult police force, which operates to divert human suspicions, and to supply explanations that are good enough for whatever, somewhat in the nature of minds, human beings have—or that, if there be occult mischief makers and occult ravagers, they may be of a world also of other beings that are acting to check them, and to explain them, not benevolently, but to divert suspicion from themselves, because they, too, may be exploiting life upon this earth, but in ways more subtle, and in orderly, or organised, fashion. [5]

"Police Operation" sees the Paratime Police scrambling to capture an alien creature that has slipped from a more technologically advanced version of the present into our own timeline (see Fig. 1). This fictional scenario has parallels in internet-era pseudoscience, where some "cryptozoologists" have argued that mystery creatures like Bigfoot may be visitors from another universe [6].

Another science fictional treatment of the Benjamin Bathurst story is Lionel Fanthorpe's novel *Time Echo*, published in 1959 under the pseudonym of Lionel Roberts. This novel sees Bathurst transported five centuries into the future, via a "time vortex". In the process, he exchanges places with a man from the future, Mike Grafton, who travels in the opposite direction.

> To use a physical analogy, he, Mike Grafton, had been displaced from his own natural environment in the 24th century. He had been standing at a precise spot in space and a precise instant of time. . . . If he was to disappear, he must disappear at the extremity of a certain time cycle. Anything which would fill his place must, in all probability, be standing at the other end of the vortex, the antipodes of the cycle from which he had been drawn. At that precise spot five hundred years ago, stood Benjamin Bathurst. He had walked around the head of his horses. . . he had been caught by a strange fourth-dimensional time vortex, and he had never been seen again in his own world. [7]

Best known in Britain as the presenter of *Fortean TV* in the 1990s, Lionel Fanthorpe was a prolific writer of science fiction and supernatural fantasy in the 1950s and 60s. Even at that time he was a devoted admirer of Charles Fort, and included references to him in several of his stories [8].

One of Fanthorpe's most overtly Fortean novels was *UFO 517*, published in 1965 under the pseudonym of Bron Fane. Amongst other "real world" anomalies, it features the case of the Devil's footprints, which Fort described in *The Book of the Damned*. Dating from February 1855, the same case was discussed in greater depth by Eric Frank Russell in his book *Great World Mysteries*. The latter includes the following quote from the prestigious *Times* of London:

> Considerable sensation has been evoked in the towns of Topsham, Lympstone, Exmouth, Teignmouth and Dawlish, in the south of Devon, in consequence of the discovery of a vast number of foot-tracks of a most strange and mysterious description.
> [. . .]
> It appears that on Thursday night last there was a very heavy fall of snow in the neighbourhood of Exeter and south Devon. On the following morning the inhabitants of the above towns were surprised at discovering the tracks of some strange and mysterious animal, endowed with the power of ubiquity, as the footprints were to be seen in all kinds of inaccessible places—on the tops of houses and narrow walls, in gardens and courtyards enclosed by high walls and palings, as well as in open fields. There was hardly a garden in Lympstone where the footprints were not observed. [9]

At the time, the prints were popularly attributed to the devil—as was often the case with seemingly inexplicable events prior to the 20th century. Subsequent theories ranged from a deliberate hoax or an unusual meteorological phenomenon to any number of animals from mice, toads and badgers to kangaroos and monkeys. One of the more sophisticated theories, put forward

by ufologist George Lyell, suggested that "the prints may have been made by a laser beam used as some sort of measuring device by a flying saucer" [10].

A beam fired by a flying saucer is also used to "explain" the Devon footprints in *UFO 517*. Significantly, this predated its non-fiction counterpart by several years. Lyell's theory appeared in the January 1972 issue of *Flying Saucer Review*; Fanthorpe's novel was published in 1965. This is also the year in which the action of the novel begins. Encountering a race of malevolent, time-travelling aliens, the protagonists succeed in capturing one of their flying saucers and proceed to battle them in various periods of the past. February 1855, for example, sees a UFO battle over south Devon:

> The disc ship shivered and shook with blood-chilling vibrations; through the reeling observation ports Val and his companions saw streaks of strange, pale grey light leaping towards them from the three opposing vessels. Where the grey beams struck the snow strange curved marks appeared. [11]

The hero later surmises that this was the incident that gave rise to the legend of the Devil's footprints.

Another scene sees the protagonists on the island of Barbados in 1820, where an incident involving an "electromagnetic ray impulse, travelling across not only space but time" repeatedly disrupts the arrangement of coffins inside a sealed tomb. This is a reference to the so-called "Creeping Coffins of Barbados", another Fortean mystery described in Eric Frank Russell's book.

The events in question occurred in the early 19th century, in a churchyard on the south coast of Barbados. Over a period of several years, every time the Chase family's private vault was unsealed to add a newly deceased relative, the coffins were found to be in wild disarray—often standing on end. The coffins were always carefully put back in their correct places, only to be found scattered about at random the next time the vault was opened. Increasingly elaborate precautions were taken to prevent unauthorised entry to the vault, but all to no avail. Eventually the family gave up and abandoned the vault. After considering various possible explanations ranging from malicious damage and natural phenomena to supernatural activity, Russell concludes:

> This writer refuses to credit that any coffins have been moved around anywhere by ghosties or eerie beasties or things that go bump in the night. Whatever shifted the coffins at Barbados and elsewhere was, I believe, a force natural enough though not within our knowledge even at the present date. [12]

An "electromagnetic ray impulse, travelling across not only space but time", perhaps?

Time-Slips

The idea of a "time-slip"—whether backwards into the past, forwards into the future, or sideways into a parallel time stream—is a popular plot device with science fiction writers. This has little relation to the actual feasibility, or otherwise, of such a scenario. It simply reflects the fact that authors are provided with almost limitless possibilities, whether their aim is action-adventure, comedy or satirical comment.

As long ago as 1889, Mark Twain's *A Connecticut Yankee in King Arthur's Court* portrayed the comical adventures of a modern-day protagonist thrust into the distant past. Isaac Asimov's first full-length novel, *Pebble in the Sky* (1949), starts with a 20th century everyman suddenly propelled thousands of years into the future, to a time when Earth is just a small part of a vast galactic empire. In Philip K. Dick's *Flow My Tears, the Policeman Said* (1974), a world-famous TV star wakes up one day to find himself in a parallel reality where no-one has heard of him.

From a scientific point of view, such time-slips are on very shaky ground. In principle it might be possible to construct a "time machine", but this would only permit travel backwards and forwards along its own time-line. Science writer Brian Clegg has emphasized "the inability of such a time machine to travel back to before it was first built" [13].

Actually it is misleading to talk about "travel in time"—or about "travel in space", for that matter. All journeys take place in four-dimensional space-time. They start at one set of spatial coordinates and one moment in time, and finish at another set of coordinates and another time. To travel from, say, the London of 2017 to the London of 1717 would requires not only a displacement in time, but also a significant displacement in space. This is because the Earth has changed position relative to the Sun and other stars over the last three centuries. If someone—Sir Isaac Newton, say—had built a time machine in London in 1717, and if that machine still existed in some dusty basement today, then it could in principle be used to travel back to 1717. On the other hand, a spontaneous "time-slip", occurring without the aid of such a device, is simply impossible.

Another common SF trope is the idea of alternate, parallel time streams. An early description of the concept was given by Stanley G. Weinbaum in his short story "The Worlds of If", dating from 1935:

> I gulped. "Sideways into time! What's there?"
> "What would naturally be there?" he snorted. "Ahead is the future; behind is the past. Those are real, the worlds of past and future. What worlds are neither

> past nor future, but contemporary and yet—extemporal—existing, as it were, in time parallel to our time?"
> I shook my head.
> "Idiot!" he snapped. "The conditional worlds, of course! The worlds of if. Ahead are the worlds to be; behind are the worlds that were; to either side are the worlds that might have been—the worlds of if!" [14]

How many such parallel worlds are there? The number might be infinite—and in an infinite number of universes, anything can happen. That is what SF writers like to hear! A particularly self-indulgent parallel world is described in Fredric Brown's novel *What Mad Universe*, originally published in *Startling Stories* in 1948 (see Fig. 2). Set only a few years in the future, the story's protagonist is a New York based pulp magazine editor named Keith Winton—responsible among other things for *Surprising Stories* (sic).

At the start of the novel, just as he is musing on his crazy authors and even crazier readers, Winton is caught in gigantic explosion. This thrusts him into a parallel time stream closely resembling the SF fantasies of those very writers and readers. The city is still called New York, but its currency is measured in credits instead of dollars, and there are purple aliens among the crowd on the streets. As the story progresses, Winton encounters interplanetary spaceships and a telepathic super-computer named Mekky. Brown uses the scenario as an excuse for a way-out SF adventure—but also as an incisive satire on science fiction itself. At the end of the story, Mekky explains Winton's predicament:

> From your mind, I can see why, out of an infinity of universes, you landed in this one.
> You mean it wasn't random?
> Nothing is random. It is because you chanced, at the exact instant of the flash, to be thinking about this particular universe. [15]

Nowadays, SF writers often give added credibility to alternate-world stories by appealing to the "many worlds" interpretation of quantum theory. This is a perfectly real hypothesis that originated with physicist Hugh Everett in 1957. It holds that every time a quantum event can have more than one possible outcome, the universe branches into different futures representing each of these outcomes. Nevertheless, this is just a conjecture for which there is no physical evidence; it is simply a way to make sense of the mathematical equations of quantum physics. There is no reason to suppose there would ever be a means of travelling from one probability stream to another [16].

Mere facts like these are not going to deter SF authors from writing about time-slips, of course—and the same goes for pseudoscientists.

Fig. 2 *Startling Stories*, September 1948, featuring Fredric Brown's *What Mad Universe* (public domain image)

One of the most famous "real world" time-slips occurred at the Palace of Versailles in France in August 1901. The witnesses were Annie Moberly and Eleanor Jourdain, respectively the Principal and Vice-Principal of St Hugh's College in Oxford. Their experience was documented in a book they

co-authored called *An Adventure*, which was published in 1911. As they walked around the gardens they gradually became disoriented, with the distinct feeling that something strange was happening to them. They could see no other tourists besides themselves, and the few people they did encounter appeared to be wearing the fashions of the late 18th century. They saw buildings and a bridge that they later discovered was demolished long before their visit. Later, trying to make sense of their experience, they carried out detailed research that led them to believe they had slipped back to 1789—the year of the French revolution.

To sceptical eyes, there is nothing in this story that cannot be explained as a misperception of commonplace events, or as a trick of the memory. Nevertheless, the extreme reputability of the witnesses, coupled with the striking details of their experience—they claimed to have seen Queen Marie Antoinette in person—meant their book was a hit with readers. As the *New York Times* observed at the time: "Their little book is far more interesting than the average mystery novel" [17].

The enduring popularity of stories like this, in spite of the flimsy evidence on which they are based, emphasizes just how many people "want to believe", like Fox Mulder of *The X-Files*. The same thing, on a much more grandiose scale, can be seen in the phenomenon that has become known as the Philadelphia Experiment.

The Philadelphia Experiment

The history of the Philadelphia Experiment is a long one, extending over many decades, and it demonstrates the complex interplay that can exist between wishful thinking, deliberate hoaxing, science fiction and pseudoscience. The story began with a series of letters written in 1955 to UFO researcher Morris K. Jessup, and signed "Carlos Allende". The letters told of a secret experiment conducted in 1943 on a newly commissioned destroyer, USS Eldridge, while it was berthed in the Philadelphia Naval Yard. According to Allende, the experiment used Einstein's Unified Field Theory (which in reality was left unfinished on Einstein's death) to turn the ship invisible. Over time, in correspondence with Jessup and others, Allende added further tantalizing details to the story. Several sailors died or were seriously injured during the experiment—allegedly one of the reasons why it was hushed up (to the extent that Allende seems to have been the only one who knew anything about it). Most spectacularly of all, while the ship was "invisible", it was said to have been instantaneously teleported to the Norfolk Naval Base in Virginia [18].

This sounds like a first-rate science fiction plot—except that Allende insisted it was all true. Nevertheless, there was no physical evidence that any of the events he described took place at all. He claimed to be an eye-witness, but when researcher Robert Goerman finally tracked Allende down in 1979—his real name turned out to be Carl Allen—he was unconvincing in the extreme. "Goerman's investigations cast an unflattering light on the life of Carl Allen. Although brilliant in school, he never really used his mind and never worked very hard at anything except what his brothers describe as leg-pulling" [19].

By this time, however, the Philadelphia Experiment has acquired a life of its own. It was too good a story, and too many people "wanted to believe". The situation became even more blurred in 1984, when the sci-fi film *The Philadelphia Experiment* was released. Loosely based on Allende's account, the movie added a twist of its own in the form of a time-slip. In the screen version, a side-effect of the experiment sees two sailors transported forward in time from 1943 to 1984. After the movie was released, the time-slip element gradually worked its way into "non-fiction" narratives of the Philadelphia Experiment. In 1997, for example, an alleged eyewitness claimed that the Eldridge "made a journey through time with convenient ports of call at Amistad Reservoir, Texas, in 1954; Chicago, Illinois, in 1969; Sebago Lake, Maine, 1997" [20].

An internet search for "Philadelphia Experiment" generates thousands of hits, most of them from conspiracy-themed sites. Visitors to such sites are seemingly undeterred by the fact that official records clearly show that USS Eldridge never docked in Philadelphia in 1943. For some people, an official denial is seen as strong corroborative evidence!

The real reason for the tenacity of such myths is their mass-market appeal: they say things many people want to hear. As researcher Jacques Vallée put it:

> When Carlos Allende claimed that he had witnessed the disappearance of a large vessel he could be readily understood by a vast audience. His revelations involved a situation anyone could clearly visualize: one instant the destroyer was in the harbour in Philadelphia, the next instant it wasn't there any more. Sailors were caught in an incredibly powerful force field. Some became ill, others became crazy. This was the kind of tale to which teenagers, science fiction buffs, military personnel and even the "average Joe" drinking beer at the corner saloon could easily relate. Even more importantly, this was the kind of story that would lend itself to adaptation and convenient filming by camera crews, a tale that was both intriguing, dramatic and visual, as opposed to most scientific endeavours which are either boring, complicated or too abstract for a general audience. [19]

Define the quantum master constraint (regularisation issues aside) as

$$\hat{M} := \int d^3x \left(\frac{\widehat{H}}{\det(q(x))^{1/4}} \right)^{\dagger} (x) \left(\frac{\widehat{H}}{\det(q(x))^{1/4}} \right) (x).$$

Obviously,

$$\left(\frac{\widehat{H}}{\det(q(x))^{1/4}} \right) (x) \Psi = 0$$

for all x implies $\hat{M}\Psi = 0$. Conversely, if $\hat{M}\Psi = 0$ then

$$0 =< \Psi, \hat{M}\Psi >= \int d^3x \left\| \left(\frac{\widehat{H}}{\det(q(x))^{1/4}} \right) (x) \Psi \right\|^2 \quad Eq\ 4$$

implies

$$\left(\frac{\widehat{H}}{\det(q(x))^{1/4}} \right) (x) \Psi = 0 .$$

Fig. 3 Excerpt from the Wikipedia article on "Loop Quantum Gravity", a present-day counterpart to the Unified Field Theory on which the Philadelphia Experiment was supposedly based (source: Wikipedia, CC-BY-SA 3.0)

This is in compete contrast to real science, which can often seem totally baffling to the uninitiated (see Fig. 3).

Modern-day folklore like the Philadelphia Experiment grows through a spiral process in which deliberate hoax, wild speculation and science fiction augment and feed off each other. A recent addition to this spiral is the 2013 film *The Dyatlov Pass Incident*, loosely based on real events that took place in February 1959. Unlike the Philadelphia Experiment, the Dyatlov Pass incident left real physical evidence behind, in the form of nine dead bodies. Several years before the film came out, an article in *Fortean Times* described it in the following terms:

> The story sounds like something out of a low-budget horror movie: nine young students go on a skiing holiday in Russia's Ural Mountains but never return. Eventually, their bodies are discovered—five of them frozen to death near their tent, four more bearing mysterious injuries—a smashed head, a missing tongue—buried in the snow some distance away. All, it seems, had fled in sudden terror from their camp in the middle of the night. . . . At the time, seemingly baffled investigators offered the non-explanation that the group had died as a result of "a compelling unknown force"—and then simply closed the case and filed it as "Top Secret". [21]

There are several factors that make this incident one of the 20th century's most intriguing unsolved mysteries. What was the "compelling unknown force" that caused the students such terror? Why did the deaths from hypothermia occur before—not after—the deaths from crushing physical injuries? Why did several of the bodies show signs of radiation damage? What were the mysterious objects seen in the sky around the time of the incident? Most intriguing of all—why did the Soviet military stamp the case Top Secret and close off the area to civilians?

The Dyatlov Pass incident has never suffered from a shortage of theories. The unusual nature of the victims' injuries has led cryptozoologists to suggest an attack by an Almasty—the Russian equivalent of Bigfoot or the Yeti. Inevitably, other speculators have pointed the finger at aliens and UFOs. It certainly seems to be the case that other people in the area saw strange orange spheres in the sky that night. Another witness saw "a shining circular body fly over the village from the south-west to the north-east . . . when the body disappeared behind the horizon, the sky lit up in that place for a few more minutes" [21].

Another theory holds that the deaths were the result of some top secret military test. The incident occurred in the depths of the Cold War, little more than a year after the launch of Sputnik 1. There is no doubt, in any case, that the Russian military were quick to move in and seal the site off from the public gaze.

The 2013 movie follows a group of American students attempting to follow in the footsteps of their Russian predecessors. After toying with all the obvious explanations—UFOs, Bigfoot, a natural accident that morphed into something more sinister through folklore and misinterpretation—the film then comes up with a new explanation of its own. This turns out to be a kind of Russian counterpart to the Philadelphia Experiment. . . complete with time-slips!

Tunguska

On 30 June 1908, a huge explosion rocked the Tunguska river valley in a remote part of Siberia. There was a sudden flash of light and heat, followed by an ear-splitting roar and a violent wind, while the sky was darkened by a spreading cloud of debris. The most obvious explanation for the event was the impact of a giant meteor. At the time, however, it was assumed that such an impact would necessarily create a visible crater, and nothing of the sort was ever found. Extensive searches revealed vast numbers of burned and felled trees

Fig. 4 Trees felled by the 1908 Tunguska explosion, seen here in a photograph taken on a 1929 scientific expedition (public domain image)

(see Fig. 4), but no impact crater. Hence another "unsolved mystery" was born [22].

It is now known that some meteors—even very large ones—can explode while still airborne, leaving no obvious crater on the ground. A well-documented example was the meteor that exploded over the city of Chelyabinsk—coincidentally also in Russia—on 15 February 2013. That object is believed to have measured approximately 18 metres across, and weighed more than 10 tonnes, resulting in "the largest known meteor explosion since the 1908 Tunguska event" [23].

The enormous size of the Tunguska explosion, and the presumed failure of the meteor explanation, led to endless speculations on the subject during the course of the 20th century—both in fiction and non-fiction. The obvious similarity of the observed effects to a nuclear explosion led many people to wonder if that was exactly what it had been (whether caused by maverick scientists or by visiting extraterrestrials). Searches were made for above-normal radioactivity, or other traces of radiation damage, with inconclusive results [22].

One of the wilder speculations came, not from the world of pseudoscience, but from two physicists from the University of Texas at Austin: A. A. Jackson and M. P. Ryan. In 1973 they suggested the culprit was a microscopically small black hole—the existence of which had been predicted theoretically only a few years previously. They argued that the impact of such an object would

"create an atmospheric shock wave with enough force to level hundreds of square kilometres of Siberian forest", and yet "no major crater of meteoric residue would result" [22].

This sounds like science fiction—and within a year it was. Larry Niven's novella "The Borderland of Sol", first published in 1974, is based on exactly the same idea. After devastating Tunguska, the black hole would have passed straight through the Earth and continued on its orbit through the Solar System. Niven's story, set hundreds of years in the future, features a character who is trying to calculate that orbit and trace the current location of the Tunguska black hole [24].

An even more far-fetched theory, which has proved particularly tenacious in the ufological community, is the notion that the Tunguska event was caused by the crash of an alien spaceship. This forms one of the "case studies" considered by Jenny Randles in her book *UFO Retrievals*. Interestingly, however, she points out that the idea originated not in ufology but in science fiction. In 1946, the Russian author Alexander Kazantsev wrote a short story based on the premise that "an alien spacecraft powered by nuclear motors had blown up above Tunguska" [25]. A similar scenario cropped up again a few years later, when the Polish author Stanisław Lem used it in his 1951 novel *The Astronauts* [26].

It was not long before the science-fictional origin of the spaceship theory had been conveniently forgotten by some authors. In their book *The Morning of the Magicians* (1963), Louis Pauwels and Jacques Bergier write:

> It is suggested in the reports of the Moscow Academy of Sciences on the explosion of 30 June, 1908, that this may have been caused by the disintegration of an interstellar spaceship. [27]

Another link between the Tunguska explosion and a spaceship—in this case, one that was built by humans rather than aliens—can be found in the novel *Chekhov's Journey* (1983) by Ian Watson. The fact that there were no human-built spacecraft at the time of the Tunguska explosion in 1908—and that the novel's title character, the Russian playwright Anton Chekhov, died in 1904—signal the fact that that this is another time-slip novel.

The action actually starts in 1990—still a few years in the future when the novel was written, and exactly a century after the real-world Chekhov embarked on a long and arduous journey across Siberia. To investigate Chekhov's reasons for undertaking the journey, which have never been entirely clear, the protagonists are making a new and experimental type of docu-drama. The actor playing Chekhov is put into a hypnotic trance, which is supposed to bring him into contact with the mind of the real Anton

Chekhov. The theory is explained using pseudoscientific technobabble as follows:

> It'll be based upon your unconscious perceptions—those are a whole lot keener than your conscious faculties. Some people still find it hard to credit, but a trance isn't an inferior mental state. Not a bit of it! The encephalograph proves the contrary. A trance is actually a far more active mental state than ordinary waking life. So it's your "super-perception" which we'll bring to the surface—recreating Chekhov in the process. [28]

The idea that historical events can be recalled through hypnosis is an accepted one in the world of pseudoscience. Fortean author Mike Dash refers to "the discovery, in the early 1950s, that hypnotic subjects could be regressed past the moment of their birth and into previous lives", and cites the case of a Welsh hypnotherapist named Arnall Bloxham who regressed more than 400 people during the 1960s and 70s—supposedly providing a wealth of factual information that could not have been known to their conscious minds [29]. This phenomenon is normally associated with the idea of "reincarnation", or the transmigration of souls from past to future lives—but in Watson's book it is simply portrayed as a kind of telepathic link between people in different time periods.

To the astonishment of everyone in the novel, it turns out that the reason Chekhov embarked on his journey was to investigate the Tunguska explosion—even though it was still 18 years in the future. To complicate matters still further, the actor keeps slipping out of Chekhov's mind and into that of a future Russian cosmonaut on board a spacecraft that is hurtling backward through time—to its destiny in Tunguska!

From a science fictional perspective, even the mainstream hypothesis of a meteor impact—which most pseudoscientists would dismiss as boringly mundane—can be made into an exciting story. This is exactly what the writers of *The X-Files* did in the episode entitled "Tunguska" (first shown in 1996). Journeying to present-day Tunguska, Agent Mulder discovers that fragments retrieved from the impact site "contain a deadly substance known as Black Oil that contains a microbial life form capable of infecting, and controlling, any and all living creatures on Earth" [26].

The Bermuda Triangle

In his long chronicle of unexplained disappearances, Charles Fort includes the following item: "Another training ship, the Atalanta (British) set sail, early in the year 1880, with 250 cadets and sailors aboard, from Bermuda, and was not heard of again" [30].

The same incident appears among many others in Charles Berlitz's best-selling book, *The Bermuda Triangle*, first published in 1974. Whereas Fort's vanishings were taken from all over the world, Berlitz focuses—as the title suggests—on those within the so-called Bermuda Triangle (see Fig. 5). The idea that this region was particularly prone to mysterious disappearances had been bouncing around in specialist publications for a decade before Berlitz wrote about it, but this was the book that brought it to mainstream attention. Four years later, the book was transformed into a movie. The movie was billed as science fiction; the book had been billed as fact.

"Fact" is a subjective term. Researcher Mike Dash classed the Bermuda Triangle among "phenomena made up of wishful thinking, poor research and misidentification":

Fig. 5 The supposed location of the Bermuda Triangle (public domain image)

> This supposed graveyard of ships and planes was promoted by writers in the early 1970s, who fixed the triangle's amorphous boundaries to include the maximum possible number of cases and copied from one to another with little regard for accuracy. Then Lawrence Kusche, a reference librarian at Arizona State University, took it upon himself to check each report against the original sources. He discovered that many of the best known cases had rational explanations. . . . Worse, several of the triangle's supposed victims had disappeared thousands of miles away. . . which is not to say that mysterious disappearances do not take place at sea, simply that there is no evidence that they regularly occur in definable locations. [31]

Undeterred by such considerations, Berlitz put forward several outlandish theories for the disappearances, ranging from space warps and alien abductions to still-functioning high-tech gadgetry on the sunken continent of Atlantis. All these ideas sound like science fiction plots—and, over the years, they have all seen service as exactly that.

Even before Berlitz wrote his book, the TV series *Doctor Who* featured the mysterious disappearance of ships (not in the Bermuda Triangle, but off the coast of Britain) in a 1972 episode entitled "The Sea Devils". The Doctor pins the responsibility on an ancient race of amphibious reptiles, operating from a deep underwater base [32]. Seven years later, in Jane Gallion's novelette "Beneath the Bermuda Triangle", the situation has become weirder and more complex. After their light plane crashes into the ocean, the protagonists find themselves inside a vast underwater dome—a relic of ancient Atlantis—complete with pyramids, mystic crystals, ancient priests and evil aliens [33].

Equally weird was *Skull the Slayer*, a short-lived series from Marvel Comics that ran for just eight issues, cover-dated August 1975 to November 1976 [34]. The story opens with the protagonists flying through a strange aerial vortex over the Bermuda Triangle. This transports them back in time to a prehistoric island, where aliens have built a huge "Time Tower" that pulls in creatures from various different stages of Earth's history—from dinosaurs to ancient Egypt to the present day.

In the third issue, as the protagonists approach the Time Tower, they come across the skeletal remains of dozens of sailors and airmen—presumably earlier victims of the Bermuda Triangle. Then in the final two issues they encounter a U.S. Navy pilot, Captain Victor Cochran, who was sent out in search of a group of torpedo-bombers that disappeared in 1945. After passing through the time vortex, Cochran was discovered by a tribe of Inca warriors who have worshipped him as a god ever since.

The reference to torpedo-bombers is an allusion to the real-world disappearance of U.S. Navy Flight 19 in December 1945. This consisted of five

Grumman Avenger aircraft, whose disappearance en masse remains one of the most enduring mysteries of the Bermuda Triangle. It is these five aircraft that are rediscovered in the middle of the desert at the start of *Close Encounters of the Third Kind*, and their crew who are seen emerging from the flying saucer in the climactic final scene.

In August 1946, a few months after the disappearance of Flight 19, a reader wrote to the SF magazine *Amazing Stories* mentioning the incident as an example of an "unsolved mystery". The editor, Ray Palmer, replied:

> About those Navy planes, now you've got something! As we remember it, search planes also failed to come back. Not a sign, not a message, just instant disappearance. And no fuss about it since, just official forgetfulness. Your editor would like to KNOW what happened, because it wasn't anything ordinary. As a matter of fact, this is only one of hundreds of mysteries of this type which have baffled the world in the past few years. But we hear nothing further about them because officialdom and "explainers of everything by means of book learning" can't explain them. We think Shaver has come closest to a real explanation, and after all, a poor explanation is better than none at all. [35]

The reader may be wondering what Palmer meant when he said that "Shaver has come closest to a real explanation". This is a reference to Richard Shaver, one of the most prolific contributors to Palmer's magazine in the late 1940s, and arguably the single most important individual in the long and convoluted interaction between science fiction and pseudoscience. Much more will be said about him in the next chapter.

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High-Tech Paranoia

Abstract Richard Shaver caused a stir in the science fiction world of the 1940s with a series of stories that blurred the boundaries between fiction, pseudoscience and paranoia. The Shaver Mystery, as it became known, told of an ancient race of degenerate humans living in underground caves, and controlling world affairs through disruptive rays and other advanced technology. Although Shaver is largely forgotten today, his legacy lives on both in the world of conspiracy theories—many of which echo his themes of secret masters and mind control—and in the paranoid fiction of writers like Philip K. Dick.

The Shaver Mystery

Raymond A. Palmer took over the editorship of *Amazing Stories* in 1938. Born in 1910, Palmer discovered science fiction as a teenager, and went on to create the world's first SF fanzine in 1930. As an editor, he specialized in the kind of unchallenging adventure stories that people automatically associate with the term "pulp science fiction". As genre historian Ron Goulart put it: "What Palmer brought forth was a thick flamboyant pulp (it eventually swelled to over 250 pages) aimed at adolescent boys, and, possibly, superstitious old ladies" [1].

Palmer was always on the lookout for new gimmicks that could help to sell his magazine. As discussed in "Charles Fort and the Forteans", when his rival John W. Campbell published Eric Frank Russell's *Sinister Barrier* in *Unknown* magazine in 1939, it was cannily presented as "fact in the guise of fiction". The idea immediately struck a chord with Ray Palmer.

As far as Campbell and Russell were concerned, *Sinister Barrier* was a one-off. For Palmer, on the other hand, the idea that fiction could be interwoven with (alleged) fact offered a virtually untouched goldmine. Within a few years he was doing the same sort of thing, on an industrial scale, in his own magazine. The result was the phenomenon known as the Shaver Mystery.

A. May, *Pseudoscience and Science Fiction*, Science and Fiction,
DOI 10.1007/978-3-319-42605-1_3

The author behind the "mystery" was Richard S. Shaver, a former factory worker who first began corresponding with Palmer in 1943. To quote another historian of the pulps, Bruce Lanier Wright:

> One of the first things he sent Palmer was a 10,000 word manuscript entitled "A Warning to Future Man", an extraordinary document outlining nothing less than an alternate history of mankind and a new physics as well. Palmer appears not to have known just what to make of this, but smelled a circulation-booster. He rewrote the Shaver manuscript into pulp fiction billed as the astonishing truth. Retitled "I Remember Lemuria", it ran in the March 1945 *Amazing* and generated an unprecedented reaction, with reader response jumping from dozens to thousands of letters. [2]

By referencing Lemuria, Palmer was tapping into an already flourishing vein of non-fiction speculation. Originally coined by 19th century scientists to refer to a hypothetical land-bridge between India and Africa, the name "Lemuria" was soon picked up by the quasi-occult Theosophical Society to describe one of the sources of the ancient wisdom they purveyed. Crossing over from mysticism to pseudoscience, the idea of Lemuria as an Atlantis-style "lost continent" was popularized in the early 20th century by authors like James Churchward—who moved it from the Indian Ocean to the Pacific [3]. In the words of Palmer's biographer, Fred Nadis:

> When Palmer titled Shaver's story "I Remember Lemuria", he sought to attract readers who would know of Theosophy and Churchward's works. The content of the story had little to do with occultist theory though. Its sources were standard space opera added to the pulp writings of H. P. Lovecraft, Robert E. Howard, Edgar Rice Burroughs and Abraham Merritt. [4]

Despite having flourished millennia in the past, Shaver depicted ancient Lemurian civilization as possessing an advanced level of technology. This was not a new idea—19th century depictions of Atlantis included flying machines and what today would be called "television" [5]. Ray Palmer's own first foray into fiction—"The Time Ray of Jandra", published in the June 1930 issue of *Science Wonder Stories*, when he was just 20 years old—saw its protagonist travel back in time to just such a high-tech civilization of the past [6].

"I Remember Lemuria" was the start of something big. In all, Palmer published more than twenty "Shaver Mystery" stories in *Amazing*. One issue—June 1947 (see Fig. 1)—contained no fewer than four stories by Richard Shaver, totalling an impressive 90,000 words.

Shaver's stories are not great fiction, and they all had to be heavily rewritten for publication by Palmer and other ghost writers. The important thing about

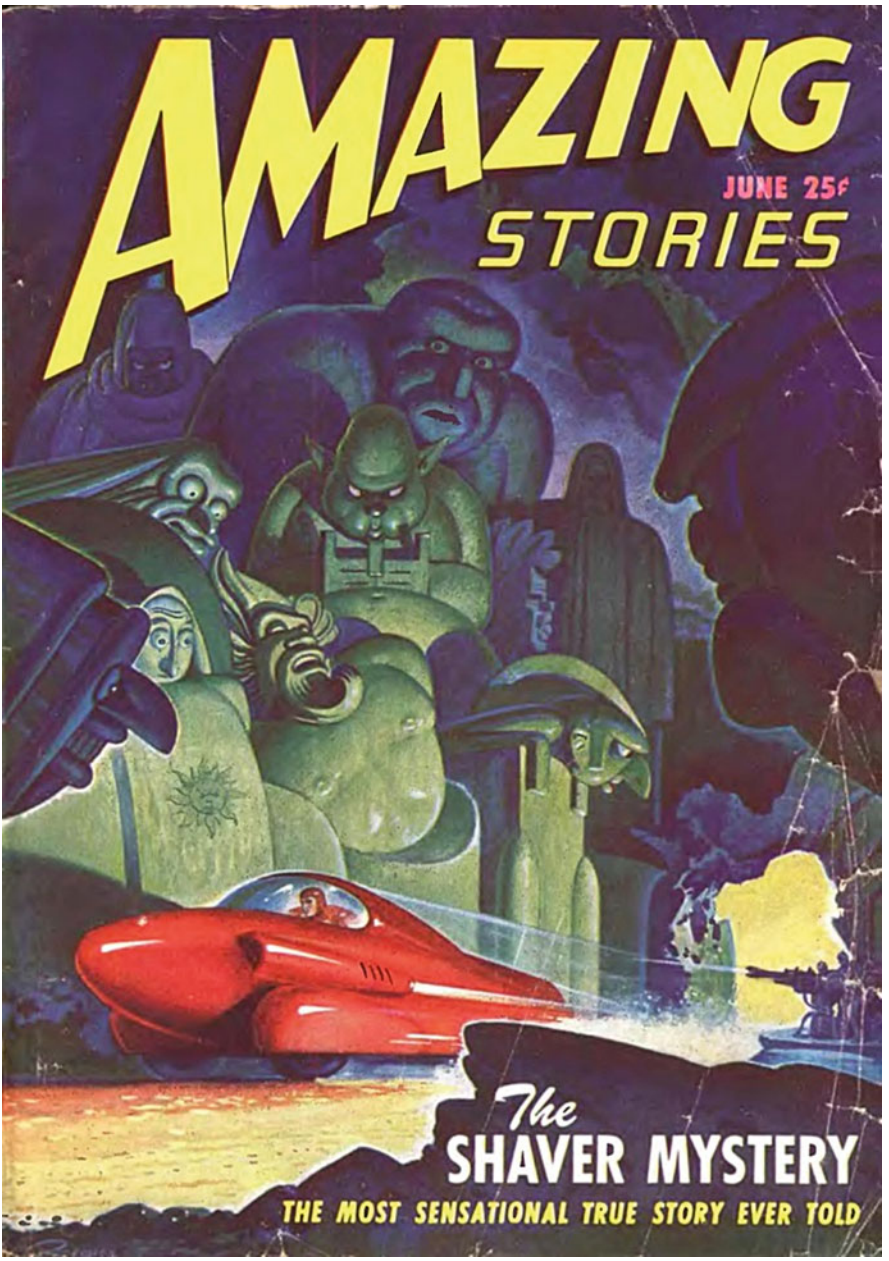

Fig. 1 The June 1947 issue of *Amazing Stories*, devoted almost entirely to the "Shaver Mystery" (public domain image)

the Shaver Mystery—the thing that helped boost *Amazing*'s readership eightfold from 25,000 to nearly 200,000 [1]—had nothing to do with writing quality, though. Like *Sinister Barrier*, Shaver's fiction was supposed to be based on a disturbingly paranoid "truth".

Shaver opened his readers' eyes to the true nature of reality. Beneath the Earth's surface lies a vast subterranean world populated by degenerate humanoids called "deros". These sinister creatures interact with surface dwellers by means of mind-control rays and the occasional abduction. Other technology to be found in the caves—according to Shaver—includes interplanetary spaceships and "thought records" from ancient Lemuria.

At the time, *Amazing Stories* sat at the bottom end of the SF market, and both Palmer and Shaver had fairly poor reputations among devotees of the genre. Certainly they were not in the same league as Eric Frank Russell and John Campbell—and Palmer was aware of the fact. He went so far as to appeal to the elevated status accorded to *Sinister Barrier* as "evidence" for the validity of the Shaver Mystery:

> *Sinister Barrier* was part and parcel of the same mystery we call 'The Shaver Mystery' today! . . . We submit that Shaver has not been original. Campbell and Russell did it first! And they did it well! We agree with them to the bitter end—Man does not rule this Earth, and it is based on fact that he does not. [7]

Eric Frank Russell almost certainly had his tongue firmly in his cheek when he wrote *Sinister Barrier*. In contrast, it seems equally likely that Shaver genuinely believed what he wrote—not because there is any truth to it, but because it appears he "was suffering from several of the classic symptoms of paranoid schizophrenia" [8]. As for Palmer, he carefully hedged his bets:

> The Shaver stories are a mystery. They are not proved. But there is truth in them. Much truth. So much that it has excited many thousands of our readers. Your editor sees truth in the stories. Shaver says they are true, basically, except for the fictional treatment he must give them to enable us to publish them. [9]

They Are Out to Get You

Modern readers may detect a strikingly familiar theme in the Shaver Mystery stories. While the idea of degenerate, cavern-dwelling deros may seem ludicrous, the *actions* of those deros closely resemble the ubiquitous "Them" of internet conspiracy theories. Consider this description, written by conspiracy specialist David Hatcher Childress in 1999:

> The deros have special beam weapon rays that they use to create as much trouble with the outside world as possible. The dero secretly foster wars, crimes and disasters while working among surface people or using their controlling rays. These rays can create solid-looking illusions, nightmares, hypnotic compulsions and urges to commit a crime. [10]

Even the most cursory internet search will find numerous websites claiming that the United States government—or some sinister supra-national group—is using secret technology to achieve exactly the same ends today.

This phenomenon is not as new as it may seem. For well over a century, references to "controlling rays" and similar technology have been recognized as a common symptom of schizophrenia. As the psychologist William Ireland wrote as long ago as 1886:

> The insane are quick to catch at new scientific notions to explain their delusions. Complaints of being electrified and being magnetized against their will have long been common, and since the invention of the telephone, they have said that there are telephones in their rooms, or that people use this instrument to torment them. [11]

By 1918, the phenomenon was so widespread that the Austrian psychoanalyst Viktor Tausk coined the term "Influencing Machine" to describe imaginary technology designed to persecute its victims:

> The schizophrenic influencing machine is a machine of mystical nature. The patients are able to give only vague hints of its construction. It consists of boxes, cranks, levers, wheels, buttons, wires, batteries, and the like. Patients endeavour to discover the construction of the apparatus by means of their technical knowledge, and it appears that with the progressive popularization of the sciences, all the forces known to technology are utilized to explain the functioning of the apparatus. All the discoveries of mankind, however, are regarded as inadequate to explain the marvellous powers of this machine, by which the patients feel themselves persecuted. [11]

It seems likely, then, that Richard Shaver was simply the latest in a long line of schizophrenics who believed themselves to be victims of such "influencing machines". If so, there is a neat irony in the ensuing fiction-fact-fiction-fact sequence. The deros and their devices originated in Shaver's imagination, but he believed them to be real. He then portrayed them in works of fiction, while assuring his readers that they were based on fact!

To emphasize this last point, Shaver's stories often included copious "factual" footnotes. Here is an example taken from the very first story, "I Remember Lemuria":

> The course of history, the battles, the decisions of tyrants and kings—was almost invariably decided by interfering control from the caverns and their hidden apparatus. This interference, this use of the apparatus in a prankish, evil, destructive way, is the source of god worship. . . .
> The remarkable part of it all is that it still goes on today. Emotional and mental stim—unsuspected by such as you and the average citizen—used in mad prankishness, all come from the ancient apparatus. If you will remember your stage fright in the school play, the many other times when your emotions seem to have gone awry without sufficient reason—were these natural?
> The dero of the caves are the greatest menace to our happiness and progress; the cause of many mad things that happen to us, even so far as murder. Many people know something of it, but they say they do not. They are lying. They fear to be called mad, or to be held up to ridicule. Examine your own memory carefully. You will find many evidences of outside stim, some good, some evil—but mostly evil. [12]

The new readers attracted to *Amazing* by the Shaver Mystery came from a much wider demographic than traditional SF fandom. Many of them had no interest in fiction at all, but were attracted by the supposedly non-fictional aspects of the Mystery. By August 1946, Palmer claimed the magazine had received "over 10,000 confirming letters from our readers" [13]. As Fred Nadis observed:

> The Shaver Mystery opened the way to a mutant form of science fiction that was to bear fruit as imaginary narratives of the weird gave way to actual sightings of flying saucers, reported visits to underground caves, and encounters with alien beings. [14]

The correspondence pages of *Amazing Stories* became one of the first major forums where people could discuss the whole range of Fortean subjects—anything from lost civilizations and mind control to alien spaceships visiting the Earth. Well before the flying saucer craze took off in the summer of 1947, the idea of alien visitation—factual as well as fictional—was an established element of the Shaver Mystery (see Fig. 2).

Here is Palmer writing in July 1946, a full year before newspapers around the world starting talking about "flying saucers":

Fig. 2 The Shaver Mystery included the concept of alien spacecraft visiting Earth, as in the story "Earth Slaves to Space" illustrated here (public domain image)

> If you don't think spaceships visit the Earth regularly, as in this story, then the files of Charles Fort, and your editor's own files are something you should see . . . and if you think responsible parties in world governments are ignorant of the fact of spaceships visiting earth, you just don't think the way we do. [15]

It was for prescient comments such as these that Ray Palmer was once described as "the man who invented flying saucers" [16]. His role in the development of the UFO myth will be examined further in the next chapter.

While readers of the Fortean kind might have enjoyed the new direction *Amazing* had taken, "the typical SF fan reaction to the Shaver Mystery was one of stark horror, not least because of its apparent popularity" [2]. One SF group even "passed a resolution that the Shaver stories endangered the sanity of their readers" [17]. A frequent criticism from fans was that the Shaver Mystery purported to be "true", and hence had no place in a magazine that was supposed to be devoted to fiction. Ultimately, this was the view that prevailed, as David Hatcher Childress explained:

> The Shaver stories were largely discontinued after the June 1947 issue because of a massive write-in campaign complaining that *Amazing Stories* was now printing "true" stories. Readers wanted a return to fiction. Ray Palmer quit in support of Shaver and went on to start *Fate* magazine. [18]

Shaver's Legacy

After its brief heyday in the 1940s, the Shaver Mystery quickly fell into obscurity. The idea of vast underground caverns filled with malevolent sub-humans and their high-tech gadgets was just too much for most people. Nevertheless, the occasional homage to Shaver's legacy does pop up now and then. One notable example occurred in 1990 in the "Judge Anderson of Psi Division" comic strip, when a sinister group of deros made an appearance in a story entitled *Shamballa* [19].

The story opens with the world being hit by a sudden plague of Fortean events: stigmatics in Rome, phantom hounds in London, a Manticore in Jakarta, a Bunyip in Australia. Judge Anderson herself witnesses a pre-Columbian meteorite crack open to reveal a living toad entombed inside it. She pays a visit to the conveniently named Department of Fortean Events, where she meets its director, Doc Rickard (a homage to Bob Rickard, the founding editor of *Fortean Times* magazine). Together, they discover the cause of the trouble:

> The deros, they called themselves—perverse throwbacks to more savage days, they delighted in death and destruction. Outlawed, they took to the deep tunnels—scheming, plotting, waiting for the day when their strength and numbers would allow . . . the conquest of the world above. [19]

Despite the similarity of name and back-story, Judge Anderson's deros are visually quite different from Shaver's—being portrayed as zombie-like and emaciated, as opposed to the grossly obese deros of the Shaver Mystery (see Fig. 3).

Just like Shaver's deros, however, the ones that Judge Anderson encounters can wreak all kinds of remote havoc in the surface world:

> These deros—they're responsible for the psi-outbreaks across the world. Omens—harbingers of foulness to come. The worse things become, the stronger the deros. The stronger the deros, the worse things become. [19]

A more light-hearted tribute to Shaver can be found in Ron Goulart's 1979 novel *Hello, Lemuria, Hello*. The back-cover blurb describes this as "one of the very few novels ever written to be based on the famous Shaver Mystery". However, while Shaver was in deadly earnest about everything he wrote, Goulart plays the same ideas for laughs.

Fig. 3 One of Shaver's deros, from *Amazing Stories*, June 1947 (public domain image)

Goulart's novel includes a pastiche of Richard Shaver in the form of a crackpot author named P. K. Stackpole. "Hello, Lemuria, Hello" is supposedly the title of Stackpole's latest book—a non-fiction one, and winner of the Crackpot Writers of America's prestigious Goofy award. Stackpole is a stereotypical paranoid, constantly complaining that he is being persecuted by Lizard People and the FBI—the latter having implanted a radio transmitter in his rectum. His writings include such articles as "Here's a Microwave Threat They Didn't Tell You About" and "The Government Is Building Concentration Camps Again and You Are Footing the Bills"—just the sort of titles that could easily be found on conspiracy websites today.

Goulart's counterparts of Shaver's deros are called "abnors", with a backstory that is almost identical:

> These Lemurian nitwits possessed incredible powers. They could, for instance, move heavy objects by will, could send their astral bodies on journeys of great distance, could control the minds of lesser creatures. . . and do a whole bag of other nifty tricks. There was a problem, though, in that a lot of them were nasty types. . . . The nasty ones were banished to caves beneath the earth, far beneath. The good ones, more's the pity, got tired of our planet and took off for new and distant worlds. Somewhere along about there the whole continent of Lemuria sank without a trace. Thereafter nobody heard much from the bad side of the family for centuries and centuries. These bad ones, by the way, are called abnors. . . . After a long period of snoozing, the abnors got active again. They commenced sending out thought messages to selected humans, causing disasters, wars and vanishings. [20]

Underground caves and ancient Lemurians aside, Shaver's core theme—that world affairs are controlled by a hidden group of "secret masters"—has proved perennially popular with both pseudoscientists and SF writers. Writing about the enormous proliferation of conspiracy websites purveying such ideas, researcher Richard Leon noted their tendency towards ideas that a rational person would describe as "science fictional":

> At their extremes, the theories they promote transcend mundane politics with tales of alien manipulations of Earth history organised into complex and complete cosmologies. David Icke famously believes that Earth is run by shape-shifting lizards from another dimension, some of whom take human form as the Royal Family. Less well-known is the montalk.net site, which includes a library of complex articles introducing readers to the concepts of invisible telepathic alien influence and timeline warfare. [21]

The concept of a world ruled by "shape-shifting lizards", attributed by Leon to David Icke, is reminiscent of a short story by Ray Nelson published in *The Magazine of Fantasy and Science Fiction* in November 1963—a significant date for conspiracy theorists, since it was the month that John F. Kennedy was assassinated.

Nelson's story, called "Eight O'Clock in the Morning", features a protagonist who is accidentally dehypnotized "all the way". This allows him to see the world around him as it really is, with ordinary people surrounded by lizard-like aliens: "the green, reptilian flesh and the multiple yellow eyes of the rulers of the earth". For the first time, his conscious mind sees the hidden commands printed on advertising posters, saying things like "Work eight hours, play eight hours, sleep eight hours" and "Marry and Reproduce".

> As soon as he got home, the first thing he did was to disconnect the TV set. In other rooms he could hear the TV sets of his neighbours, though. Most of the time the voices were human, but now and then he heard the arrogant, strangely bird-like croaks of the aliens. "Obey the government," said one croak. "We are the government," said another. "We are your friends." [22]

Nelson's short story provided the inspiration for one of the most Shaverian of sci-fi movies: John Carpenter's *They Live*, released in 1988. This portrays a world not too different from our own, with a two-tier society consisting of a small, powerful elite—which controls the flow of money and information—and a large but essentially spiritless underclass. The protagonist, who belongs to the latter class, acquires a special pair of sunglasses that enable him to see the truth. The ruling classes are in actual fact hideous alien invaders, while ordinary people are continuously bombarded with subliminal messages such as "OBEY", "CONSUME", "CONFORM", "BUY", "WATCH TV" and "DO NOT QUESTION AUTHORITY".

As with the Vitons in Eric Frank Russell's *Sinister Barrier*, the aliens are depicted as Earth's "owners". A street preacher, who is also able to see the true reality, puts it like this:

> Outside the limit of our sight, feeding off us, perched on top of us, from birth to death, are our owners! Our owners! They have us. They control us! They are our masters! Wake up! They're all about you! All around you! [23]

The Strange World of Philip K. Dick

Philip K. Dick was one of the 20th century's most prolific SF authors (see Fig. 4). Unlike Richard Shaver, Dick is highly regarded as a writer by academics. Like Shaver, however, he displayed a distinct tendency to paranoia—both in real life and in his fiction.

A constantly recurring theme of Dick's fiction is the idea that the reality we perceive around us is in some sense "fake". As he explained in 1980:

> Fakery is a topic which absolutely fascinates me; I am convinced that anything can be faked, or anyhow evidence pointing to any given thing. Spurious clues can lead us to believe anything *they* want us to believe. There is really no upper limit to this. Once you have mentally opened the door to reception of the notion of *fake*, you are ready to think yourself into another kind of reality entirely. [24]

In philosophical terms, this view shares something in common with the mystical strand of Christianity known as Gnosticism. Dick's biographer Lawrence Sutin described this as the "view that our world is an illusory reality created by an evil, lesser deity" [25]. Gnosticism as a religious movement largely died out during the Middle Ages, but its ideas gained prominence again during the 20th century thanks to the writings of people like psychologist Carl Gustav Jung [26].

Some of Dick's fictional works dramatize the Gnostic idea of a "fake universe" by positing a sub-universe that is even more fake. For example, the novels *Eye in the Sky* (1957) and *A Maze of Death* (1970) both portray a group of characters thrust into a counterfeit, mentally projected reality. In the latter novel the act is consensual—a deliberate means of escape—while in the former it is the result of an accident involving a nuclear particle accelerator. Even after

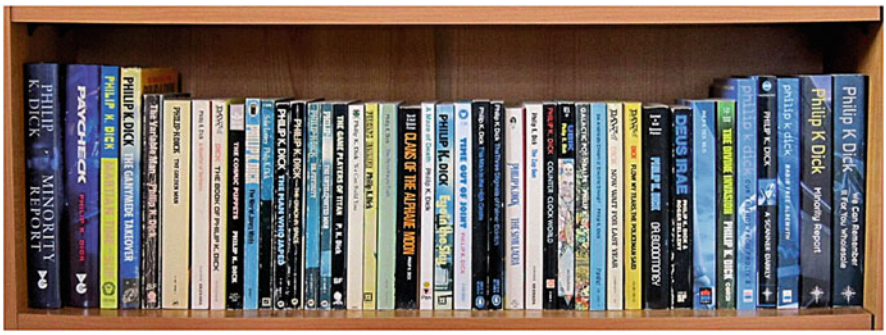

Fig. 4 A selection of books by Philip K. Dick (author's photo)

the victims realize what has happened, they are still trapped in their shared nightmare:

> All eight of us dropped into the proton beam of the Bevatron. During the interval there was only one consciousness, one frame of reference, for the eight of us. Silvester never lost consciousness.
> [. . .]
> Physically, we're stretched out on the floor of the Bevatron. But mentally, we're here. The free energy of the beam turned Silvester's personal world into a public universe. We're subject to the logic of a religious crank, an old man who picked up a screwball cult in Chicago in the thirties. We're in his universe, where all his ignorant and pious superstitions function. We're in the man's head. . . . This landscape. This terrain. The convolutions of a brain; the hills and valleys of Silvester's mind. [27]

Another common idea in Dick's work, and an even more overtly paranoid one, is that "everything the government tells you is a lie" [24]. A particularly extreme example of this can be found in his novel *The Penultimate Truth* (1964). This depicts the mass of humanity living in underground bunkers, convinced by the government and the mass media that the surface of the Earth is uninhabitable, having been ravaged by a nuclear war between East and West. In fact, this is pure fabrication—the surface world is an idyllic paradise, where the favoured elite of both sides live in peace and prosperity [28].

The government's lies in *The Penultimate Truth* extend to the rewriting of history. In particular, the Nazis—who were masters of media manipulation themselves—are made out to have been the victims rather than the aggressors during the Second World War. The use of Nazis, or neo-Nazis, to symbolize the worst excesses of government is a common theme in Dick's fiction. One of his best known novels, *The Man in the High Castle* (1963), features an alternate timeline in which the Nazis won the war and now rule the United States.

Dick's fear of Nazi-style totalitarianism was something he shared with Richard Shaver. Although Shaver was a very different writer in many ways (he never questioned his own view of reality, while Dick did so to the point of obsession), he portrayed his own nightmare of a Nazi-controlled America in a short novel called *The Mind Rovers*, published in the January 1947 issue of *Amazing Stories*. This takes place in an alternate version of the present, in which the US government is ruled by the mob, and the mob is ruled by a sadistic Nazi named Klug. In a surreal plot worthy of Dick himself, Shaver's protagonists learn how to dream themselves into other people's brains. By

hopping from one mind to another, they eventually find their way into Klug's brain in an audacious attempt to defeat the Nazi tyrant.

It is widely accepted that Richard Shaver really did suffer from clinical paranoia. That was probably not true of Philip K. Dick, although he did have psychiatric problems from time to time. As biographer Lawrence Sutin wrote:

> Phil was admitted to both Marin General Psychiatric Hospital and Ross Psychiatric Clinic in August 1971. Anne Dick writes that Phil consulted with Dr X that August, telling him that he believed "the FBI or the CIA were tapping his phone, breaking into his house when he was out and stealing his papers". Phil wished to be hospitalized for his own protection. [29]

While worries about government surveillance may seem like a classic symptom of paranoia, in Dick's case there is no doubt that the FBI really did keep a file on him. As Fortean writer Nick Redfern points out: "One of the prime reasons why Dick attracted attention from the FBI was a series of bizarre letters he penned to the Bureau in the early 1970s, in which he described his personal knowledge of an allegedly underground Nazi cabal". In October 1972, for example, Dick informed the FBI that:

> I am a well-known author of science fiction novels, one of which dealt with Nazi Germany, called *Man in the High Castle.* . . . I bring this to your attention because several months ago I was approached by an individual who I have reason to believe belonged to a covert organization involved in politics, illegal weapons etc., who put great pressure on me to place coded information in future novels "to be read by the right people here and there", as he phrased it. I refused to do this.
> [. . .]
> I would like to add: what alarms me the most is that this covert organization which approached me may be neo-Nazi, although it did not identify itself as being such. My novels are extremely anti-Nazi. I heard only one code identification by this individual: Solarcon-6. [30]

Dick's world became even stranger in March 1974, when he started to experience a series of mystical-style visions:

> I suddenly began seeing whirling lights. . . . For almost eight hours I continued to see these frightening vortexes of light. . . . One week later, under similar circumstances, I began at night to see light once more. . . . This time I saw perfectly formed modern abstract paintings, which I later identified from art books as being of the type Kandinsky developed. There were literally hundreds of thousands of them. . . . In the following days I felt that I must have been the involuntary recipient of an ESP experiment. That was most likely. I knew the

> dazzling graphics had come to me from outside of myself; I sensed that they contained information and that somehow I was to respond. . . . I even wrote to an ESP lab in Leningrad, asking if they were involved in the long-range transmission by ESP of modern art graphics. No response. [31]

These visions continued for several months, during which Dick speculated wildly about their origin. Sceptics might dismiss them as a hallucination, brought on by overwork or an underlying medical condition, or as the side-effects of medication (either legal or illegal—Dick was known to use both) [32]. However, Dick himself was convinced the phenomena had an external origin—but whether that was God, the Russians, the FBI or space aliens he was never quite sure.

He kept revolving his ideas round and round, in an ever-growing document he referred to as his "Exegesis". In this, "he began to formulate a radical, if not downright impenetrable, new cosmology revolving around what he came to call VALIS: Vast Active Living Intelligence System, an entity which somehow steered human development while concealing itself from most of the population" [32].

VALIS is also the title of a novel Dick produced in 1981—a semi-autobiographical one, since the book's narrator is clearly meant to be Dick himself. Within the world of the novel, *VALIS* is a movie which supposedly presents Dick's experiences in a popularized form that is palatable to a wide audience. In this movie, VALIS is the name of an alien satellite. As one of the characters explains:

> "They wanted to make a sci-fi flick; that's how you would handle it in a sci-fi flick if you had such an experience. . . . So they call it VALIS," Kevin said, "and make it an ancient satellite. That's controlling people to remove an evil tyranny that grips the United States." [33]

Philip K. Dick's experience was so extraordinary that it transcends the boundaries of fact and fiction. Both pseudoscientists and conspiracy theorists have picked it up as evidence for one pet theory or another. As Mark Pilkington wrote in *Fortean Times*:

> Dick's speculations ended with his untimely death in 1982, but other writers have written his experiences into their own versions of historical events. Pseudonymous author Adam Gorightly and others have wondered whether the VALIS events can be plugged into the matrix of telepathy and, some say, mind control experimentation that was being carried out in the USA and the Eastern Bloc at the time. [34]

Telepathy and mind control may be reminiscent of the Shaver Mystery, but other authors have gone even further. In a bizarre echo of Dick's fictitious movie, Paul Rydeen asked "Was Philip K. Dick's VALIS a space satellite?" Believing the answer to the question was "yes", he even provided a tentative identification of the satellite in question:

> Black Knight is the name given to a radar blip discovered in 1960. This mystery satellite was found in polar orbit, something neither the US nor the Soviets had accomplished. It was several times larger and several times heavier than anything capable of being launched with 1960 rockets. It shouldn't have been there, but it was. [35]

This is a classic pseudoscience ploy—explaining one unknown (Philip K. Dick's mystical visions) by appeal to another unknown (an alleged mystery satellite). In fact, the latter is not so much an unknown as an imaginative fabrication by various pseudoscientists and conspiracy theorists, as the website of the Armagh Planetarium makes clear:

> Black Knight is a jumble of completely unrelated stories; reports of unusual science observations, authors promoting fringe ideas, classified spy satellites and people over-interpreting photos. These ingredients have been chopped up, stirred together and stewed on the internet to one rambling and inconsistent dollop of myth. [36]

Shapeshifting Aliens

Another archetypally paranoid theme—that of malignant, shapeshifting aliens—crops up in several of Philip K. Dick's early stories. For example, in "The Father-Thing" from 1954, alien invaders surreptitiously begin to replace humans with physically identical duplicates. The story is told from the point of view of eight-year-old Charles Walton, who is the only person who can see that his father, Ted, has been replaced by a "father-thing":

> Ted jerked. A strange expression flitted across his face. It vanished at once; but in that brief instant Ted Walton's face lost all familiarity. Something alien and cold gleamed out, a twisting, wriggling mass. The eyes blurred and receded, as an archaic sheen filmed over them. The ordinary look of a tired, middle-aged husband was gone.
> And then it was back. [37]

Another Dick story from the same period is "Colony" (1953). The colony of the title is a fledgling human settlement on a new planet. Only gradually do they realize the planet is home to a hostile, shape-changing species: "a form of protoplasm, with infinite versatility" that can mimic inanimate objects like microscopes, towels and doormats before attacking the human colonists [38].

The idea of shape-changing aliens infiltrating human society was a recurrent theme of the TV series *The X-Files* in the 1990s. It first appeared in a second season episode called, coincidentally, "Colony". In this case, the colony was Earth itself—as *Fortean Times* editor Bob Rickard explained:

> What at first appears to be the continuation of a Nazi genetics project is revealed to be an alien colonisation programme that uses cloned alien-human hybrids. The mayhem results from a war between two alien races that are infiltrating this planet . . . as a shape-shifting alien assassin stalks the alien clones. [39]

A much earlier science-fictional shape-shifter appeared in the classic novella "Who Goes There?" by John W. Campbell, the editor of *Astounding Science Fiction*. It first appeared in the August 1938 issue of that magazine, under the pen-name of Don A. Stuart. One of the first really great works of science fiction, Arthur C. Clarke described "Who Goes There?" in the following terms:

> It is a work of such power that it became almost a modern myth, and has had innumerable imitators. The discovery of a spaceship that has been buried in the Antarctic ice for twenty million years, the thawing out of its one surviving crew-member, and its attempt to take over the isolated expedition by imitating perfectly man, dog or anything else it pleased is one of the all-time greats of horror. [40]

If this scenario sounds familiar, it is because Campbell's novella was used as the basis for John Carpenter's 1982 movie *The Thing*—which, as Clarke points out, sticks pretty faithfully to the original storyline.

The alien in "Who Goes There?" does more than simply imitate its victims—it absorbs their bodily substance, allowing it to assimilate one organism after another. This gives it the potential to literally "take over the world", as one of the characters, Blair, points out to his colleague Connant:

> "Take over the world! Just it, all by itself?" Connant gasped. "Set itself up as a lone dictator?"
> "No," Blair shook his head. . . . "It would become the population of the world." [41]

Fig. 5 Robert E. Howard's novelette "The Shadow Kingdom" featured sinister shape-shifting reptilians long before they became a staple of conspiracy theory (source: public domain image)

Bizarre though it is, the idea that shape-shifting aliens really are taking over the world has a number of adherents in the world of conspiracy theory. Foremost among these is the British conspiracy theorist David Icke, who was mentioned earlier in this chapter. As conspiracy researcher Jamie King explains, Icke is particularly suspicious of the British queen and her family:

> These theorists ... claim that the British royal family are part of a reptilian shape-shifting alien conspiracy to take over the world. Their goal is to create a totalitarian One World State, ruled over by a master race of beings from outer space. [42]

The royal family is just the tip of the iceberg, however:

> According to this theory, all those in positions of power are actually shape-shifting reptilian humanoids who aim to enslave humanity. Anyone who holds sway could be part of the reptilian elite—actors, musicians, politicians. [43]

As a "non-fictional" conspiracy theory, the idea of shape-shifting reptilians infiltrating the corridors of power dates back only to the closing years of the 20th century. In fictional form, however, exactly the same idea can be found in a novelette called "The Shadow Kingdom", which appeared in *Weird Tales* magazine as long ago as August 1929. The story's author was Robert E. Howard, best known as the creator of Conan the Barbarian (Fig. 5).

"The Shadow Kingdom" features a Conan-like hero named Kull, who was born in Atlantis but by the time the story takes place has become the warrior-king of a country called Valusia. Kull discovers that the Valusian court is riddled with non-human shape-shifters called Serpent Men, who are surreptitiously killing key officials and taking their place:

> As he watched, Tu's face became strangely dim and unreal; the features mingled and merged in a seemingly impossible manner. Then, like a fading mask of fog, the face suddenly vanished and in its stead gaped and leered a monstrous serpent's head!
> [. . .]
> Hesitantly Kull . . . gazed more closely at the nameless thing that had been known as Tu, chief councillor. Save for the reptilian head, the thing was the exact counterpart of a man. [44]

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Flying Saucers

Abstract Science fiction has always had a close association, and an ongoing two-way dialogue, with the subject of UFOs—Unidentified Flying Objects, widely presumed to be extraterrestrial spacecraft. Many of the established elements of ufology made an appearance in works of fiction before they were reported in the "real world", and several important authors of non-fiction UFO books started their careers in SF. Subjects like extraterrestrial life and advanced alien civilizations are not unknown to mainstream scientists, but the latter tend to talk about them in way that is significantly different—and offers much less "human interest"—than either ufology or science fiction.

From Niche Subject to Worldwide Phenomenon

When Charles Fort died in 1932, terms like "UFO" and "Flying Saucer" had not yet been coined. Nevertheless, as his biographer Damon Knight pointed out, "Fort's books are full of reports of strange phenomena . . . similar in every way to today's reports of flying saucers but centuries before they were called flying saucers" [1]. As seen in "Charles Fort and the Forteans", Fort also speculated on the possible extraterrestrial origin of such objects. In his second book, *New Lands* (1923), he wrote of:

> Ships from other worlds that have been seen by millions of the inhabitants of this earth, exploring, night after night, in the sky of France, England, New England, and Canada. [2]

The original audience for Fort's books was minuscule—limited to a small band of dedicated "Forteans", as well as a few SF readers and writers like Richard Shaver and Ray Palmer. The latter was quick to cite Fort, rather than Shaver, as the progenitor of the "extraterrestrial hypothesis". In response to a sceptical comment from a reader in the September 1946 issue of *Amazing Stories*, Palmer wrote:

A. May, *Pseudoscience and Science Fiction*, Science and Fiction,
DOI 10.1007/978-3-319-42605-1_4

> As for spaceships, you might say Shaver did not originate that, nor our readers. Ever read the books of Charles Fort? He's the culprit, if anyone is. Personally, we believe these ships do visit the earth. [3]

Nine months after these words appeared, the whole world suddenly found itself talking about mysterious objects in the sky. The flying saucer craze had started—and it was triggered by just a single sighting. In itself, this was not very different from the hundreds of previous cases discussed by Fort and Palmer. For some strange reason, however, it made headlines around the globe. In the words of UFO researcher Jenny Randles:

> The UFO mystery officially began on June 24, 1947, when American pilot Kenneth Arnold had a close encounter above the Cascade mountain range in Washington, USA.
> While flying across the north-western states on a routine business trip, Arnold's attention was caught by a flash in the afternoon sky. After ensuring that it was not a reflection off the canopy of his small aircraft, he watched in astonishment as a formation of crescent-like objects streaked across his path. As an experienced pilot, Arnold was able to judge their speed and knew that they were travelling much faster than any aircraft that he knew about.
> At the time Arnold concluded that the objects he had seen must have been secret American aircraft on a training flight. However, his brief report to ground control created more fuss than he imagined. When he reached his destination at Yakima, he was greeted by journalists eager to hear his amazing story. It was a slow news day and Arnold offered the perfect antidote. [4]

In the immediate aftermath of Kenneth Arnold's sighting, newspapers found themselves inundated with hundreds of copycat reports from across America and around the world. Some of these incidents occurred in the weeks following Arnold's encounter, while others were back-dated accounts (like those collected by Charles Fort) that had received little publicity at the time they occurred [5].

A noteworthy point in Jenny Randles's foregoing account is the description of the objects Arnold saw as "crescent-like", rather than saucer-shaped. The fact is that Arnold was ambiguous on this point. In his first official report on the incident, written less than three weeks later on 12 July, he did indeed refer to them as "saucer-like discs" [6]. On other occasions, however, he used phrases like "semi-circular", "crescent-shaped" or "bat-wing", and maintained "that he used the word saucer not to describe their shape, but how they moved, like a saucer would if you skipped it across water" [7].

Whatever shape it was that Arnold saw, subsequent UFO sightings—throughout the late 1940s and into the 1950s and 60s—were overwhelmingly

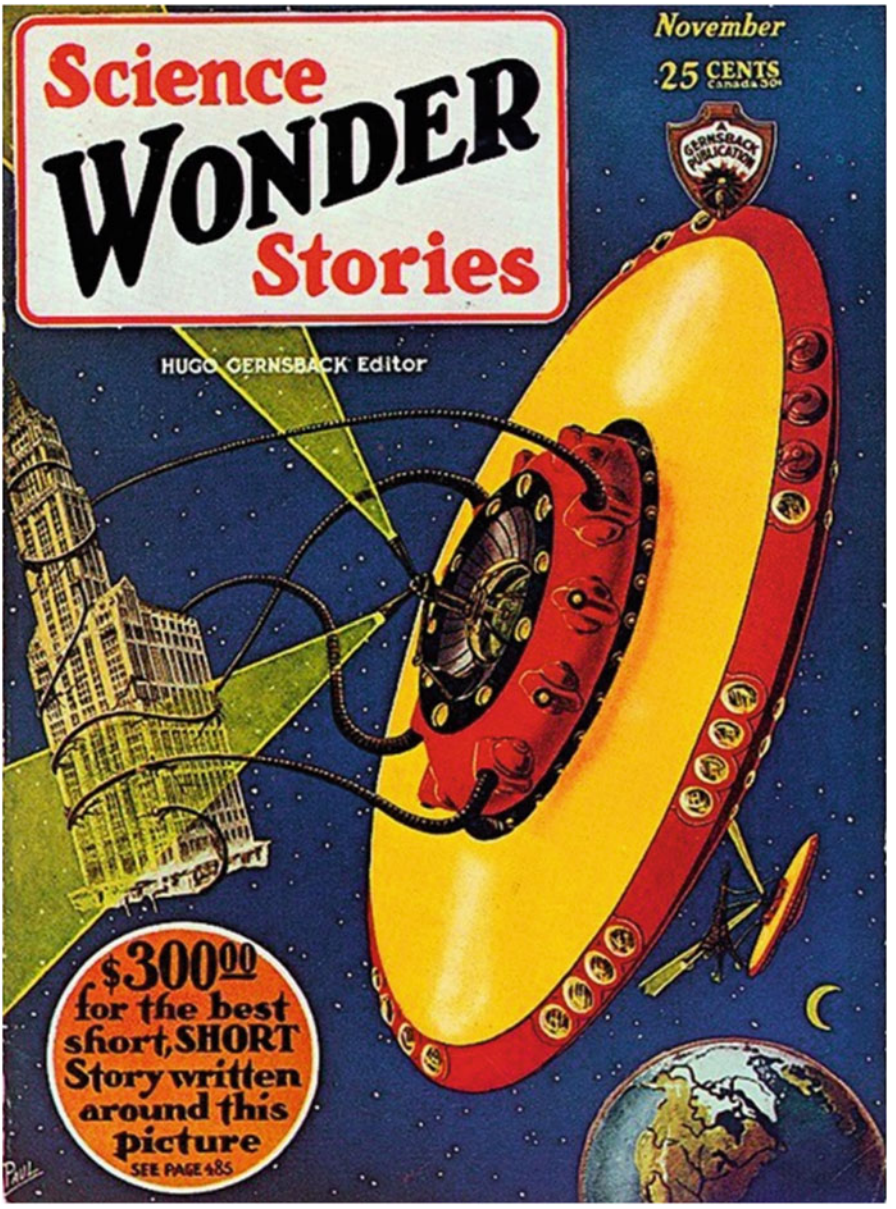

Fig. 1 The November 1929 issue of *Science Wonder Stories*, featuring a spacecraft similar to later depictions of flying saucers (public domain image)

saucer-shaped. Science fiction followed suit. Prior to then, SF writers and artists had usually envisaged alien spacecraft as being cylindrical in shape, similar to a rocket or submarine. However, the saucer shape was not unknown in SF, even as far back as the 1920s (see Fig. 1).

When Kenneth Arnold first saw his "flying saucers", he imagined they were secret military aircraft. The general public, too, did not initially make a connection between UFO reports and the notion of extraterrestrial spacecraft. During that first 1947 wave, only two witnesses expressed the opinion that the objects they saw might have been spaceships. In a Gallup poll held in August that year "outer-space explanations were so negligibly held that they were not even listed in the results" [8].

In the world of science fiction, it was a different matter. Ray Palmer, of course, was quick to advocate the extraterrestrial hypothesis—but he was not the only one. His counterpart at *Astounding Science Fiction*, John W. Campbell, expressed much the same view. In October 1947, in an editorial entitled "Flying Somethings", Campbell wrote:

> Whatever they were, if real, and as described by those who believed they saw them, a few conclusions are fairly clear. They weren't products of a foreign terrestrial power. . . the same applies to a United States Government device. . . . That would mean a fair chance that they were being piloted by visitors from outside. [9]

Campbell went on to suggest that the "visitors" were deliberately being elusive because they were engaged in covert surveillance of our planet: "They'd be very wise to learn all they could before making their interest apparent".

In Campbell's mind, the authorities were as confused by the flying saucers as the general public. Ray Palmer, on the other hand, saw the matter in a different light. Like many conspiracy theorists today, he was convinced the government already knew everything there was to know about the alien visitors. As early as July 1946, a year before Arnold's sighting, he wrote: "If you think responsible parties in world governments are ignorant of the fact of spaceships visiting earth, you just don't think the way we do" [10]. Two years later, with flying saucer reports filling the newspapers, he adopted an aggressive "I told you so" attitude:

> For more than twenty years we have been talking about spaceships, and maybe we're right at last! But "authorities" who will get the first reports of the mysterious craft, when they appear, will think there is a "leak" if they read any old issue of *Amazing Stories* at all! Moral: More "authorities" ought to read science fiction—they won't be so surprised by logical developments as they develop. [11]

Palmer began to push the extraterrestrial hypothesis as enthusiastically as he had advocated the Shaver Mystery a couple of years previously. As Isaac Asimov put it: "Now he took up flying saucers and single-handedly promoted

it into an international mania" [12]. The Fortean writer John Keel went even further, dubbing Palmer "The Man Who Invented Flying Saucers" [13].

Palmer's interest in UFOs heralded the beginning of the end of his tenure at *Amazing*—and the start of a new career as a publisher of non-fiction. As Keel explained:

> Palmer decided to put out an all-flying saucer issue of *Amazing Stories*. Instead, the publisher demanded that he drop the whole subject after, according to Palmer, two men in Air Force uniforms visited him. Palmer decided to publish a magazine of his own. Enlisting the aid of Curtis Fuller, editor of a flying magazine, and a few other friends, he put out the first issue of *Fate* in the spring of 1948. [13]

That first issue of *Fate* magazine included a piece by Kenneth Arnold himself, entitled "The Truth about Flying Saucers". A few years later, when Arnold cashed in on his experience with the publication of a full-length book, *The Coming of the Saucers* (1952), it was co-written with Ray Palmer [14].

Almost ten years after Palmer left *Amazing*, the magazine's new editors finally did produce a special flying saucer issue (see Fig. 2). Palmer himself was invited to contribute, which he did in archetypal conspiracy-theory style with an article entitled "Is the Government Hiding Saucer Facts?"

Richard Shaver was also represented, with a piece called "Historical Aspects of the Saucers". In it he remarked that:

> I appreciate the editor of *Amazing Stories* wanting to include me in the special flying saucer factual issue; it is my personal opinion that I deserve a place there, because I did tell its readers about flying saucers before anyone else. [15]

Ufology and Science Fiction

Ray Palmer was not the only pulp writer to buy into the Flying Saucer business. One of the first books on the subject was Donald Keyhoe's *Flying Saucers Are Real*, published in 1950. Keyhoe had done several stints in the military, rising to the rank of Major—a fact that was often exploited to add credibility to his writing. Most of his career, however, had been spent as a writer of pulp adventure fiction. During the 1930s he created a villain called Dr Yen Sin, based closely on Fu Manchu, as well as writing about the quasi-science-fictional exploits of a WW1 flying ace named Philip Strange. Pulp historian Don Hutchison described the character as follows:

Fig. 2 The special "Flying Saucer" issue of *Amazing Stories*, from October 1957 (public domain image)

> Known as the "Brain Devil" because of his ESP and other near-occult mental powers, Strange was an ex-child prodigy who had performed feats of magic, ventriloquism and hypnotism in showbiz. . . . The Brain Devil was also an ace flyer and Intelligence agent who used the art of disguise to confound the machinations of the Kaiser's evil scientists. [16]

Donald Keyhoe continued to write on the subject of UFOs throughout the 1950s, using the same fast-moving, easy-to-read prose style as he had in his pulp fiction. Like Ray Palmer, Keyhoe firmly espoused both the extraterrestrial hypothesis and the notion that the U.S. Government (from which he was long retired) was involved in a conspiracy to hide the truth from the public. As UFO historians David Clarke and Andy Roberts observed: "Keyhoe's writings had a massive impact on public opinion and as a result he became a major headache for the U.S. Air Force for years to come" [17].

As far as the majority of SF authors were concerned, Palmer and Keyhoe were in the minority. To quote the *Encyclopedia of Science Fiction*: "Most genre-SF writers are hostile to the extraterrestrial hypothesis—a reaction to the unjustified public assumption that SF writers are deeply interested in ufology" [18].

An exception to this rule is Otto Binder, who was a prolific writer of science fiction throughout the 1930s and 40s. He later turned to non-fiction, becoming a champion of the extraterrestrial hypothesis in books like *What We Really Know About Flying Saucers* (1967). In 1969 he combined his two interests with a novel called *Menace of the Saucers*—published under the byline of "Eando Binder", which he had used for some of his earlier fiction.

Menace of the Saucers reads almost like ufological metafiction. Its protagonist is an SF writer named Thane Smith, who has always been outspokenly sceptical about UFOs—until, at the start of this novel, he has a close encounter of his own. The text is filled with real-world reports of the kind found in many non-fiction UFO books, and Thane experiences for himself many of the oddest features of such reports. He gradually learns the logic behind seemingly illogical observations such as the saucers' defiance of the known laws of physics, the enormous variation in descriptions of their occupants, and the near-impossibility of obtaining any kind of firm proof of their existence [19].

Two years after *Menace of the Saucers* Binder produced a sequel, *Night of the Saucers*. This second novel sees Thane Smith making a return to sceptical UFO-debunking, as zealously as ever. This is not because he is once again a non-believer, but because he now knows the full truth about UFOs—and knows that the truth needs to be concealed at all cost!

Otto Binder was a fiction writer who switched to non-fiction ufology, then back to fiction in order to proselytize his views on the UFO "conspiracy". Exactly the same pattern cropped up again, two decades later, in the case of a much more famous author: Whitley Strieber.

Strieber first hit the headlines in 1987 with his non-fiction book *Communion*, although by that time he was already well established as a writer of fiction. Over the previous decade he had produced a steady stream of horror novels, which were successful but not outstandingly so. By contrast,

Communion, subtitled "A True Story", was a worldwide bestseller. In harrowing detail, it described Strieber's own personal "alien abduction" experience. Thanks to widespread newspaper and TV coverage of Strieber's book, this previously little-known aspect of ufology suddenly reached a global audience [20].

Two years after *Communion*, Strieber returned to fiction in 1989 with an SF novel called *Majestic*. In the acknowledgments at the start of the book, the author describes it as "a work of fiction based on fact"—very much the same terms Eric Frank Russell had used to describe his seminal novel *Sinister Barrier* fifty years earlier (see "Charles Fort and the Forteans"). Just as Russell had done, Strieber explained that he was presenting his narrative in fictional form in order to protect himself from reprisals from the authorities. He claimed that a lawyer friend had advised him that: "Your only hope is to publish your book as fiction. They'll figure if they hit you, it'll tell the world it's all true" [22].

The focal point of Strieber's novel is a real historic event, albeit one that is subject to multiple interpretations. This is the so-called Roswell incident of 8 July 1947—just two weeks after Kenneth Arnold's original sighting—when a "flying disc" was reported to have crashed near the military airbase in Roswell, New Mexico [4]. After an initial flurry in the world's media, the crashed object was soon dismissed as a weather balloon and forgotten. The event was hardly ever mentioned by ufologists until 1980, when a book was published on the subject: *The Roswell Incident* by William Moore and Charles Berlitz [23]. This book, followed by a stream of further "eyewitness" revelations, transformed the Roswell incident into the world's best-known UFO case—complete with crashed saucer, recovered alien bodies, reverse-engineered technology and a massive government cover-up.

Around 1984, members of the UFO community became aware of a set of supposedly Top Secret documents that appeared to blow the lid off the Roswell case. These documents concerned a top-level government team, called "Majestic-12", which had allegedly been set up in the wake of the Roswell crash. It is the historical background to these documents that Strieber portrays in his novel *Majestic*. Although the book is ostensibly fiction, Strieber claims it is based on his first-hand—or near first-hand—knowledge of the facts:

> In 1988, my uncle told me that he had personally been aware of and involved with the management of the debris that had been brought from Roswell to Wright Field in 1947. . . . He was in a position to know what he was talking about. [21]

Yet again we have a situation where an author claims that a book, presented in the form of fiction, is actually based on solid fact. Yet the supposed "fact" in question—the existence of the Majestic-12 group—is itself almost certainly fictitious. As Fortean investigator Mark Pilkington discovered, the first of the documents mentioning it "was a fake, and not a very convincing one to those who knew what they were looking for" [24].

Later documents building on that shaky start appear to have been tailored, not for an official government audience, but for the ufological community itself. Any community that bases its philosophy on the mantra "I want to believe" is going to be relatively easy to dupe. Whether the Majestic-12 documents were a random act of mischief-making—by what today would be referred to as "trolls"—or part of a more deliberate "disinformation" campaign, is still unknown [25].

Since the end of the 20th century, the Roswell legend has continued to thrive and grow on ufological internet forums. Often, as in Strieber's novel, the details that emerge can seem closer to science fiction than anything that might happen in the real world.

In November 2005 an anonymous source, claiming to be from a U.S. intelligence agency, posted information online about a supposed "exchange visit" made by American servicemen and women to the home planet of the Roswell aliens. The account contained intriguing details of the planet in question, which was given the name "Serpo" and supposedly located in the Zeta Reticuli star system. To quote Mark Pilkington again:

> Over the next few weeks Serpo began causing a splash on the internet. . . . with its terse, militaristic, first-person narrative, the Serpo papers combined the intensity of a Tom Clancy thriller with the pulp charm of an Edgar Rice Burroughs space opera. [26]

In January 2006 a second anonymous user, claiming to be a former employee of the British Ministry of Defence, posted their own "inside line" on the Serpo material. The whole thing had been made up, they claimed, as part of a Cold War exercise in disinformation:

> Originally it was a CIA document authored by a lady named Alice Bradley Sheldon. Its main purpose, if you will pardon the phrase, was to "scare the crap out of the Soviets" in response to them scaring the crap out of us. [27]

The interesting thing here is that Alice Bradley Sheldon was a real person, who really did work for the CIA for a few years in the 1950s. By the 1960s, however, she had switched to an entirely different career—as a science fiction

author. Using the pseudonym of James Tiptree, Jr., she produced a stream of award-winning short stories during the 1970s and 80s. It is feasible, therefore—though not necessarily likely—that Alice Sheldon might have been asked by the government to produce disinformational literature of this kind. On the other hand, the way the Serpo story was brought to light by anonymous internet users suggests it was an imaginative project of a different kind—a sort of online role-playing game.

The choice of "Zeta Reticuli" as the home system of the Roswell aliens is an interesting one. The role of that particular double-star system in ufology dates back to one of the earliest abduction cases, involving New Hampshire couple Betty and Barney Hill in 1961. After the abduction, under hypnosis, Betty recalled a star map that she had been shown by her alien captors. This was subsequently interpreted by an amateur astronomer as depicting the Zeta Reticuli system. Without knowing the scale and orientation of the map, however, this interpretation is ambiguous—and, of course, it depends on Betty's accurate recollection of a traumatic experience [28].

Cultural Tracking

One of the distinctive features of UFO reports is the way that, despite their supposedly other-worldly origin, they seem to mirror the earthbound culture of the time and place at which they occur. Often referred to as "cultural tracking", John Spencer gives an example of this phenomenon in his *UFO Encyclopaedia*:

> Witnesses aboard flying saucers have reported, for example, chunky number counters on the saucer control panels, but we did not have reports of liquid quartz readouts until we ourselves had invented them. [29]

Cultural tracking effects also manifest themselves in parallels between UFO witness accounts and the depiction of extraterrestrial technology in popular culture. The heyday of flying saucer sightings in the 1950s coincided with numerous low-budget sci-fi films featuring alien contact (see Fig. 3).

In many cases, film-makers exploited details of recent UFO reports in order to add verisimilitude to their fiction. In some instances, however, the fictional portrayal of a phenomenon appears to *predate* its occurrence in the real world. An example of this is the "car stop" effect, which often features in accounts of UFO encounters. As ufologist Jenny Randles puts it: "The first a witness usually knows about the arrival of the aliens is when their car engine and lights fail to operate in the presence of a UFO". However, she adds that the first

Fig. 3 UFOs and alien invaders became a staple of B-movies such as *Plan 9 from Outer Space* (1959) (public domain image)

known occurrence of such an event, in 1951, took place not in real life but in a movie, *The Day the Earth Stood Still*: "before 1951 there were no cases where such an effect had been reported in real UFO cases" [30].

Another example of the real world taking its cue from Hollywood is given by UFO historian David Clarke:

> From the late 1970s onwards, a new type of UFO arrived. Huge, black triangles were often seen hovering or cruising silently over roads and cities. . . . Curiously, such reports coincided with the debut of an imaginary spaceship with a strikingly similar shape: the Imperial Star Destroyer that had appeared on cinema screens just seconds after the opening credits for George Lucas's 1977 space epic *Star Wars*. [31]

The most obvious interpretation is a sceptical one: that UFOs have no objective reality. Witnesses misinterpret what they see in terms of what they expect to see, and their expectations are derived in part from popular-culture depictions of UFOs and extraterrestrials. The counter-argument holds that real-world experiences *always* predate their Hollywood counterparts, even if they are not well publicized until after the movie version has appeared. The truth probably lies somewhere between the two extremes, with a continuous two-way interaction between UFO reports and science fiction [32].

In the 1970s, the ufologist J. Allen Hynek distinguished three different types of "close encounter"—as opposed to merely seeing a distant unidentified object in the sky. A "close encounter of the first kind" meant the object was close enough for the witness to make out distinct details of its structure and appearance. A "close encounter of the second kind" was one where the UFO "has a measurable physical effect on either animate or inanimate matter" (a "car stop" incident of the type mentioned earlier would be an example of this). Finally, a "close encounter of the third kind" is one in which the UFO's occupants are seen [33].

Close Encounters of the Third Kind is, of course, the title of a famous 1977 film directed by Steven Spielberg. The title was chosen as a deliberate homage to Hynek, who even makes a cameo appearance in the film's climactic scene.

Although alien visitors and flying saucers were hackneyed Hollywood subjects by the time *Close Encounters* appeared, this particular movie was unusual in that it took its inspiration more from the world of "non-fiction" ufology—such as Hynek's books—than from the established SF tropes of its day. Thus, while nothing in the film would have come as a surprise to people with a committed interest in the subject, its central concepts—of government cover-ups and alien abductions—would have been a complete revelation to the bulk of the viewing public.

Another important effect of Spielberg's film was to crystallize the public's perception of what an "alien" looked like: a small, greyish-coloured figure with a smooth, child-like body and a disproportionately large head. Such creatures had featured previously in UFO reports—Betty and Barney Hill's abductors were of that type, for example—but so had many other shapes and sizes. From the late 1970s onwards, the vast majority of alien sightings conformed to the small, grey type seen in *Close Encounters of the Third Kind*.

Surprisingly, however, the *Close Encounters* aliens owed more to their creators' imaginations than to real-world witness accounts. In the words of UFO historian David Clarke:

> Steven Spielberg is on record as having wanted to avoid the stereotypical bug-eyed monsters that had dominated 1950s cinema. So he asked his special-effects wizard Carlo Rambaldi to create "something about four feet tall with a very large head and a slender body". The film's promoters pushed the idea that key scenes were rooted in real-life reports of UFOs and their occupants, but in Rambaldi's own words the director "gave me no actual design". As a result, the appearance of the grey, foetus-like alien captain who greets Roy Neary at the end of the movie was entirely speculative. [34]

The release of *Close Encounters* in 1977 led to a huge upsurge of interest in the subject of UFOs. It also boosted belief in the extraterrestrial hypothesis, and the number of reported UFO encounters. A survey carried out in America that year found that 57 per cent of respondents believed that "UFOs were real", while 7 per cent claimed to have seen one themselves [35]. In 1978, Britain's Ministry of Defence received no fewer than 750 reports of UFO sightings—the largest number there had ever been [36].

No-one can question the massive impact Spielberg's film had on the public's perception of ufology. To a sceptic, this simply means that the film created a myth that a large number of people choose to believe in. Not everyone subscribes to this view, however. Many people in the UFO community are convinced that *Close Encounters of the Third Kind* was a deliberate attempt to leak the truth about UFOs in fictional form. Spielberg himself carefully hedged his bets on the topic: "If you believe, it's science fact; if you don't believe, it's science fiction" [37].

Wishful Thinking

The central character in Robert Silverberg's novel *Tower of Glass* (1970) is a multi-billionaire, Simeon Krug, who is obsessed with the idea of finding extraterrestrial life. When his scientists finally detect a coded radio signal, Krug is overjoyed. The message defies all attempts to decipher it, but it is obvious from its logical, non-random structure that it has an intelligent origin. To Krug, this can only mean one thing: that the signal originates from a human-like species on an Earth-like planet orbiting a Sun-like star. So he is horrified when he discovers that the long-awaited message actually emanates from a radioactive nebula around a blue giant star: an impossible environment from the point of view of an Earth-like planet.

> In his long dreams he had seen something entirely different. He had imagined a planet of a yellow sun . . . a gentle sun much like the one under which he had been born. He had dreamed of . . . elegant slender beings . . . sending their message to the universe. He had seen them opening their arms to the first visitors from Earth, saying "Welcome, brothers, welcome, we knew you had to be there". All that was destroyed now. In the eye of his mind Krug saw a hellish blue sun spitting demonic fires into the void . . . saw a band of horrors gathering around a nightmarish machine to send an incomprehensible message across the gulf of space. [38]

The truth is that Krug is not interested in extraterrestrial life—only in one very specific type of extraterrestrial life. This sort of wishful thinking is prevalent among ufologists, too. When they talk about the potential abundance of "life in space", their definition of "life" is often limited to something very like present-day human civilization—or perhaps a few hundred years in advance of it. The sort of aliens reported by UFO witnesses often look improbably close to *homo sapiens* (see Fig. 4).

The Earth is currently home to some 8.7 million living species [39], of which *homo sapiens* is just one. Life has existed on Earth for at least 3.8 billion years, or something like 84 per cent of its 4.5-billion-year history [40]. Yet human civilization—going back, say, to the time of Stonehenge—is just one millionth of the age of the planet. In probability terms, averaged over the lifetime of the Earth, the likelihood of finding *life* is very high, while the probability of finding *civilized human life* is microscopically small.

The lack of temporal perspective displayed by most ufologists works in the other direction, too. They not only forget that for most of its history the Earth was inhabited by lower lifeforms, but they also fail to consider the possibility that much higher lifeforms might develop millions of years into the future.

Fig. 4 Example of an improbably human-like alien (public domain image)

To find meaningful speculation on this subject we need to graduate from pseudoscience to "real science". In the 1960s, the Russian physicist Nikolai Kardashev proposed a classification scheme for highly advanced civilizations based on the amount of energy they would be capable of exploiting [41]:

- A type I civilization is one that could tap into the entire energy output of its planet—something we could envisage our own species doing within the next few centuries.
- The next step, a Kardashev type II civilization, would be capable of accessing all the energy produced by its sun—for example by redistributing the mass of a Jupiter-sized planet into a thin shell around the star in order to trap its energy.
- The final logical step in the sequence is Kardashev's type III civilization, capable of exploiting the energy of a whole galaxy.

Each of these steps involves harnessing about ten billion times as much energy as the previous one. Science writer Michio Kaku estimates that it would take thousands of years to progress from type I to type II, and up to a million years from there to type III [41].

Realistically, any civilization capable of effortless interstellar travel is going to be at least type II on the Kardashev scale, if not type III. It seems improbable that such an advanced culture would use flying machines and other hardware that is remotely recognizable to ourselves—or even that they would retain organic, physical bodies.

Even if the aliens started out as biological creatures like ourselves, by the time they had the technology needed for interstellar travel they might reasonably be expected to have equally advanced "cyborg" style technology. For example, they might be able to upload themselves into machines that are more resilient, more capable and more durable—or possibly even encode themselves in the form of radiation capable of travelling at the speed of light. From this viewpoint, Stanley Kubrick's film *2001: A Space Odyssey* (1968) may provide a more realistic portrayal of a Type II+ civilization than *Close Encounters of the Third Kind*.

One of the strangest speculations to emerge recently from the world of fundamental physics is the concept of a "Boltzmann brain". The name comes from the 19th century Austrian physicist Ludwig Boltzmann, one of the great pioneers of statistical mechanics. Boltzmann showed, among other things, that over the course of time extremely improbable states of high complexity can arise out of random thermal fluctuations. Postulated as an extreme consequence of this effect, Boltzmann brains are, in the words of *New Scientist*, "fully formed, conscious entities that form spontaneously in outer space" [42].

This sounds like science fiction—and in fact the British astrophysicist Fred Hoyle did write a novel about an entity somewhat akin to a Boltzmann brain (almost half a century before the term was coined). *The Black Cloud* (1957) "imagines life and intelligence evolving within a cloud of interstellar dust" [43]. Several years later, in collaboration with Chandra Wickramasinghe,

Hoyle wrote a non-fiction book, *Lifecloud*, which similarly argued that life may be capable of evolving in empty space [43]. Hoyle and Wickramasinghe championed the theory, known as Panspermia, that all life—including life on Earth today—was originally seeded from outer space [44].

Another example of highly advanced—and very different—alien creatures can be found in Fredric Brown's short story "The Waveries", originally published in *Astounding Science Fiction* in January 1945. Waveries take the form of electromagnetic waves, and as such can travel through empty space at the speed of light. Attracted by the Earth's radio and TV broadcasts, they proceed to invade the planet:

> Earth is now surrounded, completely blanketed, by radio-type waves which travel ceaselessly around the Earth in all directions, changing shape at their will—which currently is still in imitation of the Earth-origin radio signals which attracted their attention and brought them here. [45]

"The Waveries" is an eye-opening story for its portrayal of an alien species that is as different from ourselves as it is possible to imagine. In 1976 Philip K. Dick wrote that it "may be the most significant—startlingly so—story SF has yet produced" [46].

Even the popular TV show *Star Trek* portrayed the diversity of alien life in a more imaginative way than it is usually perceived by ufologists. The early episode "Errand of Mercy" (1967) featured a race called the Organians, who turned out to be near-omnipotent beings of pure energy—the end result of millions of years of evolution. As the show's Mr Spock—himself a classic example of an improbably human-like alien—put it, "the Organians are as far above us on the evolutionary scale as we are above the amoeba" [47].

The true nature of the Organians is only revealed at the very end of the episode; up to that point they choose to take the form of ordinary-looking humanoids. This is no accident: TV viewers need alien characters they can relate to. The same is true throughout science fiction, written as well as visual. The comparative scarcity of non-humanoid aliens in SF arises not because its writers underestimate the diversity of extraterrestrial life, but because their stories need to be able to hold an audience's interest.

While this tendency to anthropomorphism and the "human interest angle" is understandable in the context of fiction, much the same principle seems to apply to ufology as well. On the face of it this is strange, because its adherents maintain that they are dealing with the real world, not a world of fantasy. Yet most of the aliens they encounter are humanoid in form, and culturally quite similar to humans—even to their seeming obsession with sex and sexuality (see Fig. 5).

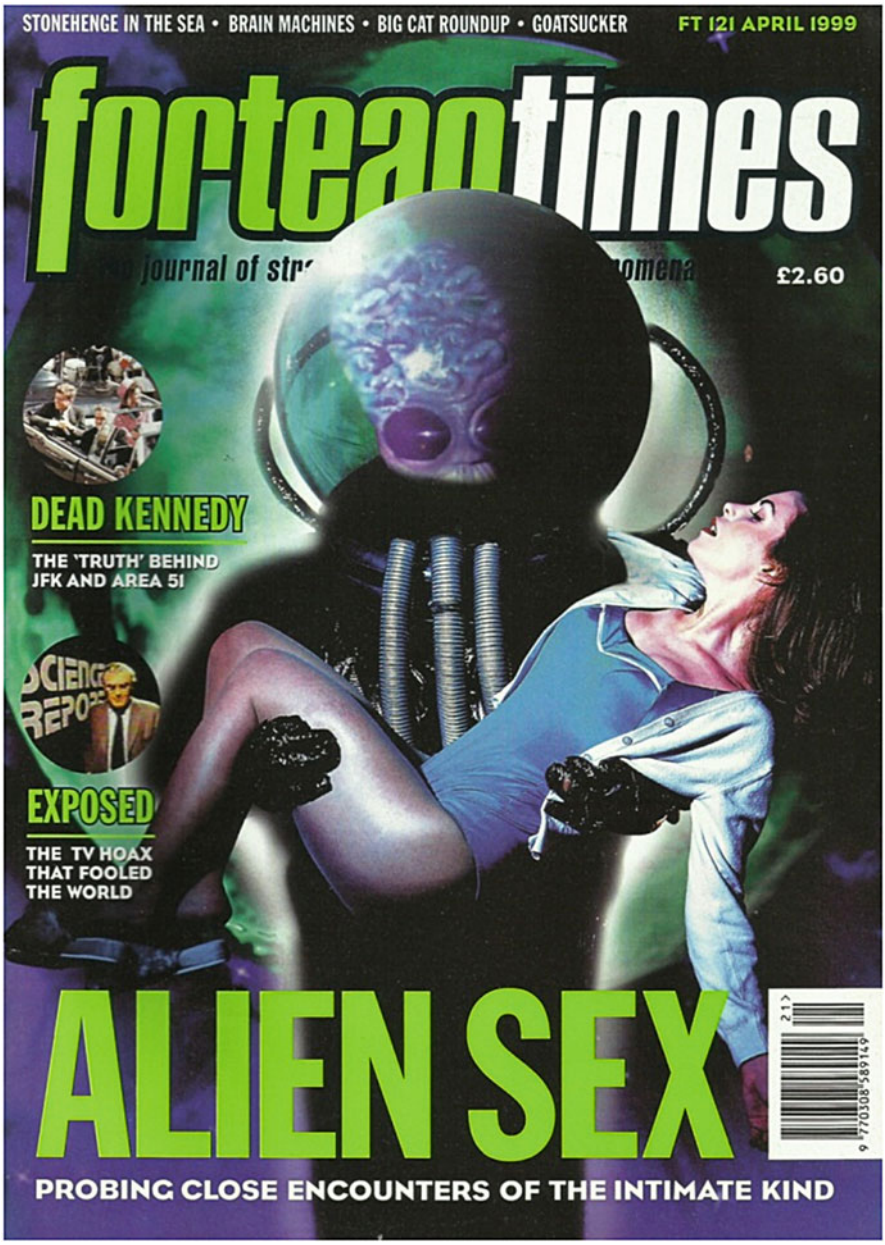

Fig. 5 Real-world reports of intimate alien encounters often mimic science fiction (image copyright *Fortean Times*, reproduced with permission)

Alien Sex

The first sexually explicit UFO encounter occurred in 1957, after a flying saucer appeared over the field where Brazilian farm worker Antonio Villas Boas was working. The engine of his tractor cut out, and space-suited aliens emerged to take him inside the craft. Villas Boas was stripped, subjected to a brief medical examination, and then left alone with an equally naked alien female. Without saying a word, she mounted him and proceeded to copulate with him in an inter-species sex session "during which she growled like a dog" [48].

For Villas Boas, the experience seems to have been a pleasurable one. The same is true of a number of other people—both male and female—who reported close encounters of the sexual kind during the ensuing decades. For example, the American jazz singer Pamela Stonebrooke claimed intimacy with a reptilian alien:

> He just appeared in my bedroom and began making love to me. The sex was incredible . . . it was like everything you wanted it to be. There was a telepathic communication and I felt totally connected to this being. . . . You sense the vibration, our bodies merge . . . your whole body has an orgasm. It's not just localized, it's a total merging of energy and spirit. [48]

In other cases, sexual exploitation by extraterrestrials can be an unwanted, frightening and often painful experience. This seems to be particularly true in the case of alien abductions recalled under hypnosis, where witnesses tend to describe the experience as cold, clinical and distressing. As researcher Mike Dash explains: "women had their eggs harvested while male abductees were hooked up to pumping machines that expressed the sperm from their bodies" [49].

Many ufologists assume the purpose of human-alien sex, whether consensual or not, is to produce hybrid offspring. This may seem a reasonable assertion to someone who is ignorant of genetics, but from a scientific point of view it is ludicrous. Human beings share 98.8 per cent of their DNA with chimpanzees [50], yet the two species cannot interbreed to produce hybrid offspring. A species from another planet would be more distantly related to *homo sapiens*, not only than a chimpanzee, but than any other terrestrial species from an earthworm to an elephant.

Despite its impossibility, the idea of human-alien hybrids has become deeply ingrained in popular culture. To some people the idea is horrific, while to others it is highly attractive—on the same level as Simeon Krug's wishful thinking about "space brothers" in *Tower of Glass*. As recently as April

2016, *Fortean Times* carried a report about a "Hybrid Baby Community" in the United States: "a group of women claiming they have offspring fathered by aliens, who live with their fathers on spaceships" [51].

As with Antonio Villas Boas and Pamela Stonebrooke, the members of the Hybrid Baby Community seem to relish their alien encounters. According to one of them: "It was an incredible super primal sexual experience. There was a real freedom and we were really going for it. It was the best sex I ever had" [51].

The idea of human-alien hybrids was popularized by the TV series *The X-Files* in the 1990s. In that case, however, the hybrids were produced not through sexual intercourse but in alien laboratories. Given a sufficiently advanced technology, this is a much less ridiculous concept—particularly if "alien hybrid" is interpreted to mean "genetically engineered by aliens", rather than a literal genetic cross between species from different planets.

An alternative take on the theme of alien hybrids can be found in the 1995 film *Species*. Like Silverberg's *Tower of Glass*, this starts with a coded radio signal being received from an extraterrestrial source. In this case, however, the message is far from incomprehensible—it is a blueprint for the genetic modification of human DNA. Naively, the scientists who receive the message go ahead and make the suggested modification in a human foetus, which they call Sil. Only too late do they realize they have fallen for the ultimate "trojan horse"—a malicious strategy designed to invade the Earth.

Initially resembling a normal human female, Sil gradually transforms into a more alien-looking creature, designed by the Swiss artist H. R. Giger. According to researcher Benjamin Radford, this design had an impact on modern culture far beyond anything the film-makers could have expected.

Early in 1995, shortly before *Species* was released, there were a number of sightings of a mystery creature in Puerto Rico that was dubbed *chupacabra* (Spanish for "goat-sucker"). However, it was only in August, a month after the film opened in Puerto Rico theatres, that a witness saw chupacabra clearly enough to provide a detailed description of it. As Radford points out, the overall impression was of a creature (see Fig. 6) very similar to the alien in *Species*:

> The chupacabra and the Sil creature from *Species* share many identical features, including: a large, oblong head; big, wraparound eye shape; black or red eyes; a small or non-existent nose; the absence of ears; bipedalism; long, thin arms; long, thin legs; long, thin fingers; a small, lipless mouth; large spikes down the spine; and the lack of a tail. [52]

Radford goes on to note further echoes of the film in two of the explanations put forward for the sudden appearance of chupacabra in the mid-1990s: "that

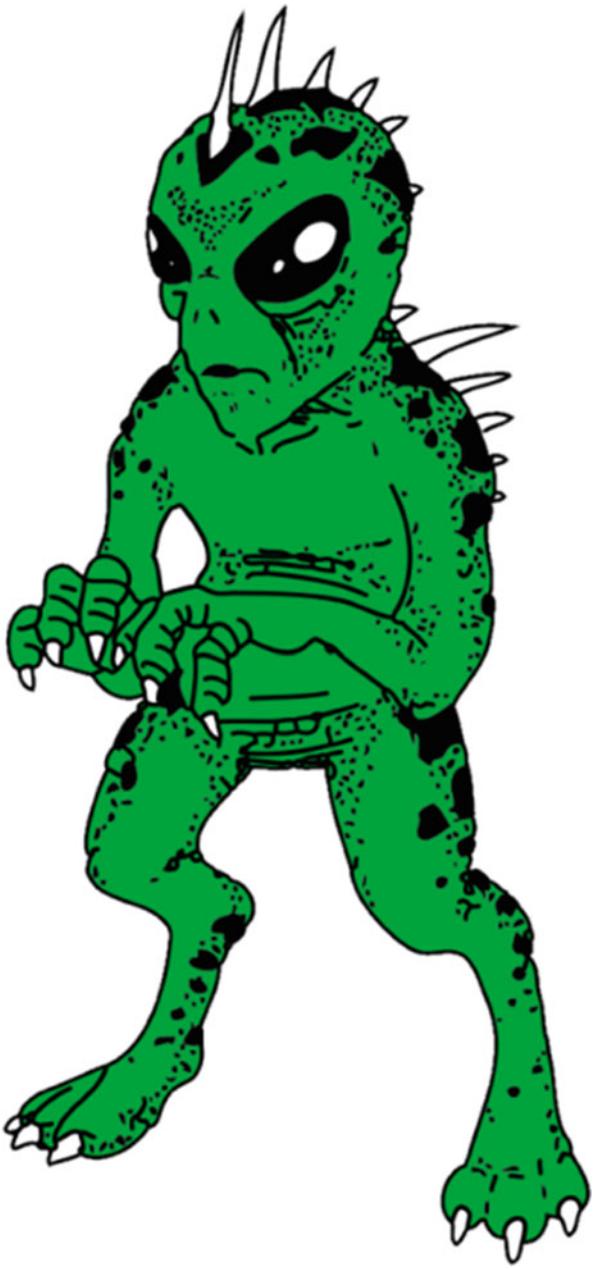

Fig. 6 Artist's conception of the chupacabra, showing several similarities to the alien depicted in the 1995 movie *Species* (public domain image)

it is either an extraterrestrial alien life form or the result of top-secret US government genetics experiments". He is not suggesting that anyone deliberately fabricated a myth based on what appeared in the film—rather that when people are faced with a situation they have never encountered before, their interpretation of it may be conditioned by the popular culture of the day.

Beyond the Extraterrestrial Hypothesis

By far the best known explanation for UFOs is the "extraterrestrial hypothesis", that they are spaceships from another planet. The main alternative, the so-called "psycho-social hypothesis", is much less familiar to the general public. One of its proponents, David Clarke, describes it as "more of a philosophy than an attempt to explain everything by reference to a single cause". In the psycho-social hypothesis, he says, UFOs are seen as "products of our minds: projections of our anxieties or aspirations, culturally determined fantasies or hallucinations or new religions in the process of emerging from the ashes of the old" [53].

One of the first people to put forward such a view was the psychologist C. G. Jung, in his 1959 book *Flying Saucers: A Modern Myth of Things Seen in the Skies*. Jung spent much of his career studying the psychology of mythology, folklore and mysticism, and he saw UFOs as part and parcel of the same phenomenon:

> For a decade the physical reality of UFOs remained a very problematical matter. . . . The longer the uncertainty lasted, the greater became the probability that this obviously complicated phenomenon had an extremely important psychic component as well as a possible physical basis. This is not surprising, in that we are dealing with an ostensibly physical phenomenon distinguished on the one hand by its frequent appearances, and on the other by its strange, unknown, and indeed contradictory nature.
> Such an object provokes, like nothing else, conscious and unconscious fantasies, the former giving rise to speculative conjectures and pure fabrications, and the latter supplying the mythological background inseparable from these provocative observations. [54]

Throughout the 1950s, there were essentially only two views on UFOs: either they were alien spacecraft, or they were uninteresting and unworthy of study. Jung's book changed that. As ufologist Hilary Evans put it:

> For the first time since they had appeared, Jung sanctioned a view of the saucers which neither accepted them at face value, nor dismissed them wholesale as did the sceptics, but saw them as a genuine phenomenon occurring on a different level of reality. [55]

Interesting as this idea is, it has rarely been picked up in science fiction, which tends to prefer the literality of the extraterrestrial hypothesis. One notable exception is J. G. Ballard's short story "The Venus Hunters", which was originally published in 1963, just four years after Jung's book. The story is

told from the point of view of a pair of professional astronomers who cross paths with a flying saucer "contactee" named Charles Kandinski. Modelled to some extent on the real-world contactee George Adamski, Kandinski makes similarly grandiose claims about having spoken to wise, benign humanoids from Venus. The astronomers know these claims are physically impossible—yet at the same time they can see that Kandinski is completely sane and totally sincere. They come to view him (and by extension, real contactees like Adamski) as the modern-day equivalent of a mystic or an Old Testament prophet:

> Most people regard Charles Kandinski as a lunatic, but as a matter of fact he is performing one of the most important roles in the world today, the role of a prophet alerting people of this coming crisis. The real significance of his fantasies … is to be found elsewhere than on the conscious plane, as an expression of the immense psychic forces stirring below the surface of rational life. [56]

William Gibson's 1981 short story "The Gernsback Continuum" makes an explicit connection between UFO sightings and science fiction (the title is a reference to SF pioneer Hugo Gernsback, who was mentioned in "Charles Fort and the Forteans"). One of the story's characters, a jaded Fortean journalist, offers his own neo-Jungian interpretation of alien encounters:

> All these contactee stories, for instance, are framed in a kind of sci-fi imagery that permeates our culture. I could buy aliens, but not aliens that look like Fifties comic art. They're semiotic phantoms, bits of deep cultural imagery that have split off and taken on a life of their own. [57]

Another work of fiction that takes a Jungian line is Ian Watson's 1978 novel *Miracle Visitors*. Its protagonists undergo a series of ostensibly typical UFO encounters, but like Ballard's astronomers and Gibson's journalist they come to understand these experiences in terms of a psycho-social hypothesis. In Watson's variation on the theme, the whole UFO phenomenon is a manifestation of a higher state of consciousness towards which parts of humanity are striving. Both Ballard and Gibson managed to work references to Jung into their stories, and Watson does the same in his novel:

> Jung spoke out because he saw that a major psychic transformation was on the cards. By that, I mean a shift in the whole structure of knowledge. . . . Jung saw the UFO "sky wheels", quite rightly, as focal patterns for the breeding of, let's say, a new kind of transcendent consciousness—a fusion with some higher order of mental information. [58]

Ideas like these take us beyond the realm of nuts-and-bolts spaceships and into speculations on the power of the human mind—which just happens to be the subject of the next chapter.

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Mind Power

Abstract Most people use their minds for thinking, and according to conventional science that is all they can do. Thinking, however, gives rise to imagination, and using their imagination is what science fiction writers and pseudoscientists do best. In the world of the imagination, the powers of the mind are unlimited: from telepathy and precognition to psychokinesis and teleportation. Although most commonly associated with SF, these concepts crop up in non-fiction too, for example in J. B. Rhine's ESP experiments or Charles Fort's speculations about "wild talents". The mysterious Force of *Star Wars* has its non-fictional counterpart in Wilhelm Reich's orgone energy, while comic-book mutants can trace their ancestry to the mystical writings of Pauwels and Bergier.

Wild Talents

Charles Fort believed that certain individuals possess what he called a "wild talent", beyond the explanation of contemporary science. The unifying feature of such talents is that they involve mysterious powers of the mind. Examples are telepathy (direct mind-to-mind communication), precognition (seeing the future) and psychokinesis (moving or manipulating objects without touching them).

The idea that such powers exist is not a new one, although in the past they would have been given labels like "witchcraft" or "sorcery". As long as people have believed in such things, others have been happy to fake such talents as a way to make easy money. No-one is more gullible that someone who "wants to believe". On the other hand, sceptics have been around as long as believers. In Shakespeare's play *The Comedy of Errors*, written in the 1590s, one of the characters, arriving in Ephesus in Turkey, says:

> They say this town is full of cozenage; as nimble jugglers that deceive the eye, dark-working sorcerers that change the mind, soul-killing witches that deform

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> the body, disguised cheaters, prating mountebanks, and many such-like liberties of sin: if it prove so, I will be gone the sooner. . . . I greatly fear my money is not safe. [1]

A whole new breed of frauds and charlatans arose in the late 19th and early 20th centuries, with the emergence of "psychical research" as a distinct subject. The people who undertook such research were serious-minded and usually well-educated, yet they proved to be as gullible and easily fooled by trickery as anyone else. One of the best known of these psychical researchers was Sir Arthur Conan Doyle, the creator of that ultra-rational detective, Sherlock Holmes. Yet Doyle also wrote science fiction stories, featuring the exploits of another larger-than-life character called Professor Challenger, and he took a strong interest in psychic and paranormal topics. He was a member of the Society for Psychical Research, and president of the London Spiritualist Alliance [2].

Doyle wrote several non-fiction books on paranormal subjects, and worked a spiritualist subtext into his final Professor Challenger novel, *The Land of Mist* (1926). The book was not well received by Doyle's fans. To quote SF historian Sam Moskowitz:

> Dismay was widespread when reading revealed that Challenger, who is now somewhat older and has lost his wife, receives a message from her from the spirit world . . . and is converted to spiritualism. [3]

It is ironic that Doyle's most famous creation, Sherlock Holmes, is known for his infallible reasoning power, yet Doyle himself was easily fooled by tricksters and charlatans. "The author was notoriously bad at spotting fakes", as science writer Brian Clegg points out in his book *Extra-Sensory* [4]. A particularly famous example involved a set of photographs taken in 1917 by two young girls, apparently showing diminutive fairy-like creatures. To Doyle, these photographs were conclusive proof of the supernatural, and he made a huge effort to bring them to the attention of the public. Yet the girls subsequently confessed that the photographs had been faked [5].

One person who became inspired after hearing a lecture by Arthur Conan Doyle in the 1920s was an American botanist named Joseph Banks Rhine [6]. He switched disciplines to psychology and moved to Duke University in North Carolina, where he began to conduct much more rigorous "psychical" experiments than had ever been done before. He adopted the more neutral term *parapsychology* to describe his work, as well as the phrase Extra-Sensory Perception, or ESP, in place of emotionally loaded words like "telepathy" and "precognition". Another new word, *psi*, was coined later to cover the whole range of parapsychological phenomena.

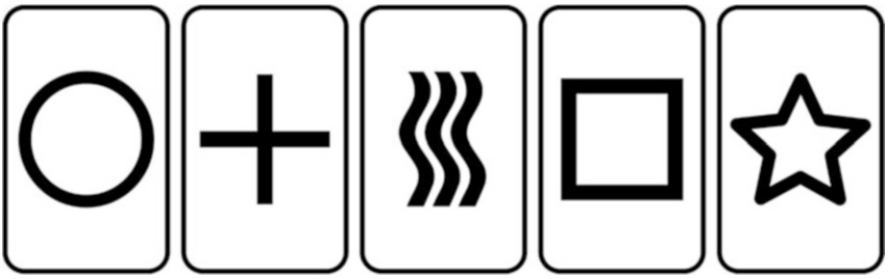

Fig. 1 A set of Zener cards, as used in J. B. Rhine's parapsychology experiments. Typically the tester would view a large number of such cards in a random sequence, while the person being tested would try to guess the correct image as often as possible (public domain image)

Unlike the early psychical researchers, Rhine was keen to quantify his work in a way that was more amenable to scientific analysis. With a colleague named Karl Zener, he developed a set of five cards that could be used in statistical "thought-reading" experiments [6] (see Fig. 1).

Rhine's method involved carrying out large numbers of experiments, and then looking for statistical deviations from the results expected from mere chance. He convinced himself that such deviations existed, but unfortunately they tended to be very small, and were open to other interpretations [7]. This is quite different from the way ESP is usually portrayed in fiction. To quote Brian Clegg again:

> The other issue with Rhine's experiments, something that has been the case with almost all academic work on ESP, is that it didn't attempt to detect what we would normally think of as telepathy. When Professor Xavier in *X-Men* indulges in telepathic communication, a literal worded message passes from brain to brain. ... But practically every laboratory experiment has used statistical means to look for small changes in perception from those predicted by random chance. [8]

Despite the ambiguity of his results, J. B. Rhine has become symbolic of the notion that parapsychology is a respectable branch of science. As such, his name is often invoked by science fiction authors to give credibility to ideas that go far beyond anything Rhine actually demonstrated. An example of this is a 1954 novel by Wilson Tucker, which bears the Fort-inspired title *Wild Talent*. Its protagonist, Paul Breen, can do far more than guess the correct card more often than random chance. He can read other people's thoughts clearly, reliably and accurately. While still a teenager he unwittingly attracts the attention of the FBI, and by the age of 24—in the final year of World War Two—he is forcefully recruited into military intelligence.

Over the following years, with just a handful of people carefully guarding the secret of his existence, Breen proves to be an invaluable tool in the Cold War against the Soviets. As he explains to an operative who is being sent to Russia:

> You do the mental broadcasting and I do the receiving. No couriers, no cables, no in-between contacts. [. . .] I'm able to follow you wherever you go, see what you see, hear what you hear, know every thought that passes through your head. I can do it any time, all the time. The distance involved is no barrier at all. [9]

The idea that, in the real world, anyone with a genuine wild talent would be snapped up for secret military work is an appealing one. There really was a paranormal-themed Cold War programme, called Remote Viewing or RV, which was passed between various U.S. agencies during the 1970s and 80s. The idea was to use ESP to spy on military installations in other parts of the world. Subsequently declassified information indicates that the method had its occasional successes, but it was eventually dropped nevertheless.

The problem was exactly the same as with Rhine's experiments—the technique was simply too unreliable and unpredictable. As writer Jim Schnabel, who has studied the subject, put it: "On a day-to-day basis, RV seems to have been less than robustly useful . . . it was fluky". Even the most ardent proponents of the method admitted as much. One of them told Schnabel "I agree that it's not ready to be a major intelligence source", while the best another could say was "it works *sometimes*" [10].

Applied Parapsychology

One of the best known "real world" psychics is Uri Geller, who came to prominence in the 1970s with a seeming ability to bend metal objects—spoons in particular—simply by exerting the force of his mind [11]. Perhaps the most noteworthy thing about this is its banality. Although Geller claims to use genuine psychokinesis, the act itself resembles nothing so much as a stage magic trick. This is hardly the material for a gripping story, and fictional psychics tend to use their powers in much more spectacular ways.

A particularly striking example is the novel *Jack of Eagles*, written in 1952 by James Blish. Back in the 1930s Blish had been the youngest member of the Fortean Society [12], and in this—his first novel—he explores the more sinister ramifications of Fortean-style wild talents. The protagonist, Danny Caiden, discovers that he has one such talent himself—precognition. In trying

to make sense of it, he visits a "Psychic Research Society", only to discover that it is the front for a secretive organization bent on world domination.

Using a range of talents—telepathy, psychokinesis, precognition, teleportation—the PRS members are steadily taking over major businesses and criminal rackets. Far worse, though, are the visions of possible futures that Danny witnesses, in which the PRS may end up forming a despotic world government, destroying planet Earth ... or even eradicating the whole universe:

> This was the PRS's ultimate aim: a sequence apparently emptied of all meaning, apparently emptied even of the very tissue of space-time. [...] The PRS, which alone knew how the condition was produced, could license favoured people for access to other, more liveable sequences, or it could deny access at its own will. [13]

This is certainly a more ambitious undertaking than spoon bending!

The negative portrayal of parapsychological powers is something that bothered John W. Campbell, the editor of *Astounding Science Fiction*. He believed in the reality of such powers, and that they represented a positive future for humanity. During the 1950s he made a concerted effort to get authors to write stories along these lines, but with limited success. When an anthology of such stories was published in 1969, Campbell stated in the introduction that: "In the realm of ESP or psi stories I by no means succeeded in getting anywhere near the quantity or the quality I wanted". He went on to say:

> In the stories I got, wicked men successfully used psi powers for their evil ends, but heroic characters used psi with tragic results. The repeated thesis in literally hundreds of would-be psi stories was a very slightly disguised message: "Psi is basically evil and awful and nothing good can come of it and we should stay far, far away from it." [14]

Campbell did receive a few stories that communicated the psi-positive message he was looking for. One of these, which is reprinted in the 1969 anthology, is "What Thin Partitions" by Mark Clifton and Alex Apostolides (see Fig. 2).

"What Thin Partitions" takes place in the research department of a private company, where a strange discovery is made. If correctly activated by a psychically sensitive individual, small chemical cylinders can be made to fall upwards instead of down. In the context of the story, this is "real science", not pseudoscience, because it is repeatable and it has clear practical applications. The story's first-person protagonist argues that the discovery does not conflict

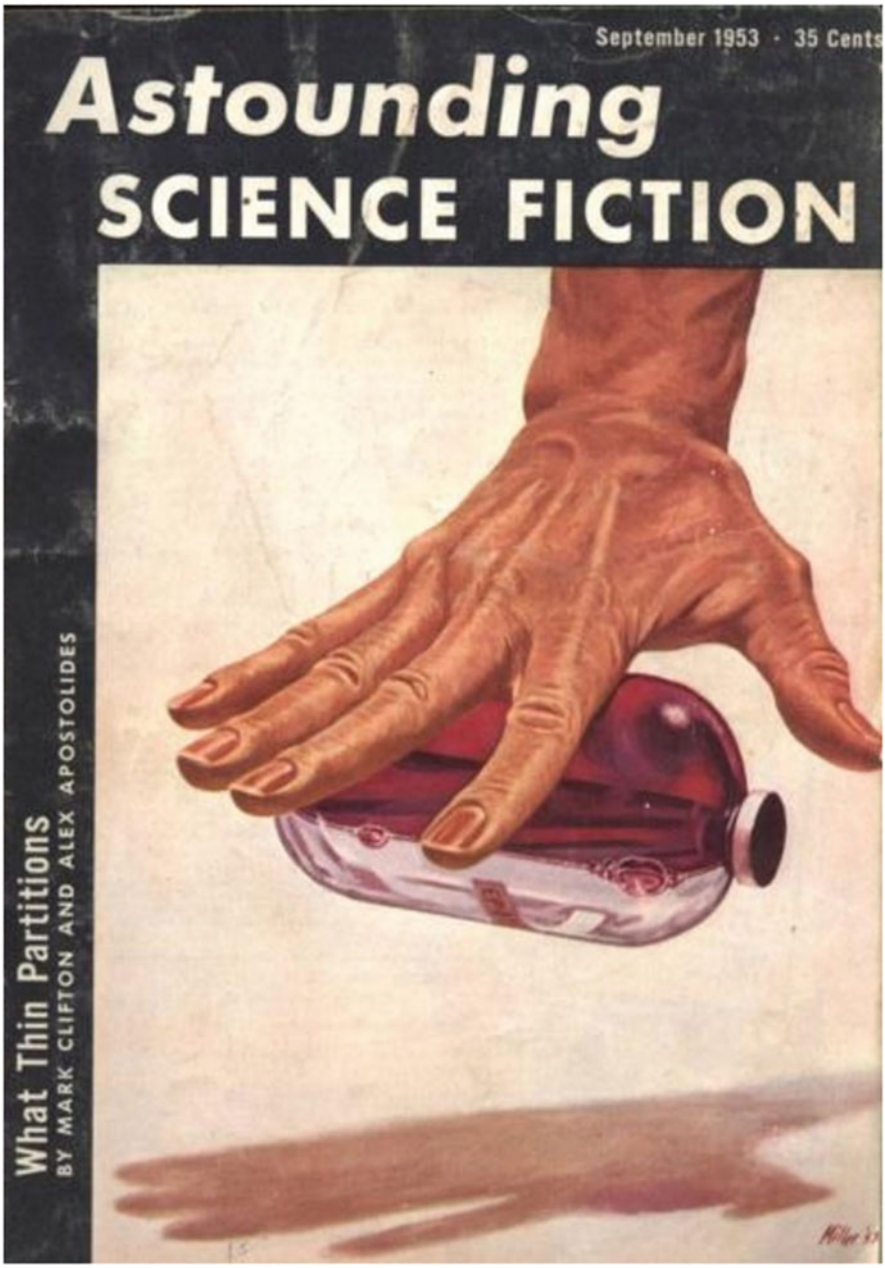

Fig. 2 The September 1953 issue of *Astounding Science Fiction*, featuring the story "What Thin Partitions" which deals with parapsychology experiments (public domain image)

with science—it just means that the previously established framework of scientific laws was not quite the right one:

> There may be any number of frameworks, separated from one another by perhaps the thinnest of partitions, each containing its own set of real world conditions, natural laws, consistent with itself, obeying its own logic, having its own peculiar cause-effect sequences. [15]

This argument seems to parallel the concept of "paradigm shifts" used in the philosophy of science. In this context, a paradigm is the established framework of theoretical laws, which has to be forcibly modified when a major empirical breakthrough is made. The idea was first articulated in Thomas Kuhn's book *The Structure of Scientific Revolutions*, published in 1962 [16]—almost a decade after Clifton and Apostolides's short story.

Another author who, like John Campbell, became convinced of the reality of psi was Colin Wilson. He wrote both fiction and non-fiction; his first non-fiction book was written in 1956 and his first novel in 1960. As his career progressed, he became increasingly fascinated with the world of strange powers. A recurrent theme throughout his fiction and non-fiction is "that most people live a robotic existence far below their real potential" [17].

One particularly practical application of ESP that fascinated Wilson was "psychometry"—the ability to view the past history of an object merely by handling it. This forms the subject of his non-fiction book *The Psychic Detectives* (1984). In it, Wilson traces the concept back to Victorian times, and an American researcher named Joseph Buchanan. As early as 1848, Buchanan recognized the practical potential of psychometry:

> If, then, man, in every act, leaves the impression or daguerreotype of his mental being upon the scenes of his life and subjects of his action, we are by this law furnished with a new clue to the history of our race. . . . The ancient manuscripts, paintings and other works of art are doubtless still instinct with the spirit that produced them, and capable of revealing to psychometric exploration the living realities to which they were once connected. . . . The past is entombed in the present! [18]

Fifteen years before Wilson wrote *The Psychic Detectives*, he portrayed the use of psychometry as a research tool in his novel *The Philosopher's Stone* (1969). The first-person protagonist discovers he has an aptitude for psychometry while examining a 16th century manuscript in the British Museum:

> I turned the pages casually, and then stifled a yawn. Pretending to bend over the manuscript, I supported my forehead on my hand, and closed my eyes. My

> mind immediately drifted into a blank, pleasant void. But at the same time, I became aware of "vibrations", of smells and sounds. I opened my eyes quickly, for long enough to confirm that the smells and sounds were not actually present in the manuscript room, then closed them again. . . .
> I was in a narrow, winding street, with timbered houses that almost met overhead. The stink came from the cobbles underfoot . . . a broad open sewer ran down the middle of the street. [. . .] The curious thing about this London of the late sixteenth century—for I had no doubt at all that this was what I was looking at—was its alternation of tightly packed houses with open spaces. [. . .] There was no "unreality" about all this. I could see it as clearly as I could see the actual faces in Piccadilly a few hours before. [19]

Quantum Consciousness

Dan Brown is a best-selling novelist who has developed an unusual but highly successful formula. He constructs his books around striking but not widely held fringe theories, which he presents as mainstream, academically accepted facts. The most notorious examples are the pseudo-historical theories in *Angels and Demons* and *The Da Vinci Code*, concerning the Illuminati and the "bloodline of Christ" respectively. However, pseudoscience is given a similar treatment in his 2009 novel *The Lost Symbol*.

The specific pseudoscience in *The Lost Symbol* is called "Noetic Science". The word "noetic" was coined by the 19th century occultist Madame Blavatsky, to describe the materialist Western understanding of consciousness in contrast to the spiritualist Eastern version, which she referred to as "manasic" (The words *nous* and *manas* both mean "mind"; the first in Greek and the second in Sanskrit). In the 1970s, the term "Noetic Science" was adopted by some researchers as a virtual synonym of "parapsychology", to emphasize its supposed roots in physical science rather than psychology [20].

Nevertheless, Dan Brown manages to give the impression that Noetics is a newly emerging branch of mainstream science: "The study of mankind's direct and immediate access to knowledge beyond what is available to our normal senses and the power of reason" [21]. He also makes the repeated claim—common among pseudoscientists—that there is a close connection between recent discoveries in physics and ancient mysticism. One of the novel's characters, Katherine Solomon, began her career as a conventional physicist but by the time the action takes place she is a complete convert to Noetic Science:

> Her work in this lab had proven beyond the shadow of a doubt that "mind over matter" was not just some New Age self-help manta. The mind had the ability

> to alter the state of matter itself, and, more important, the mind had the power to encourage the physical world to move in a specific direction.
> *We are the masters of our own universe.*
> At the subatomic level, Katherine had shown that particles themselves came in and out of existence based solely on her *intention* to observe them. In a sense, her desire to see a particle manifested that particle. Heisenberg had hinted at this reality decades ago, and now it had become a fundamental principle of Noetic Science. [22]

The "Heisenberg" referred to here is Werner Heisenberg, one of the founders of quantum mechanics. Amongst other things, he developed a mathematical formula concerning quantum measurements which has become known as the Uncertainty Principle. The formula has a very precise meaning and very precise consequences, but the phrase "uncertainty principle" has been latched onto both by pseudoscientists and New Age gurus to mean more or less anything they want it to mean. It is in this latter sense that Dan Brown invokes Heisenberg in his novel.

Quantum mechanics is a genuine science, which really does have some very strange and counter-intuitive implications—but only on very small scales (see Fig. 3). Furthermore, it can only be understood at a meaningful level in mathematical terms. It is an egregious error to assume that the short-hand jargon employed by scientists to describe the mathematics—terms like uncertainty principle, entanglement and "superposition of states"—have any relevance to the macroscopic world of human experience.

Such considerations do not deter the pseudoscientists, however. To quote Brian Cox and Jeff Forshaw:

> Extrasensory perception, mystical healing, vibrating bracelets to protect us from radiation and who-knows-what-else are regularly smuggled into the pantheon of the possible under the cover of the word "quantum". This is nonsense born from a lack of clarity of thought, wishful thinking, genuine or mischievous misunderstanding, or some unfortunate combination of all of the above. [23]

On occasion, even reputable mainstream scientists have indulged in some fairly wild quantum speculations. In 2001, the Nobel-prizewinning physicist Brian Josephson caused an uproar in the scientific community by suggesting that recent developments in quantum theory "might lead to an understanding of processes not yet explained by conventional science, such as telepathy" [24].

On other occasions, Josephson has championed the idea of "water memory" as a possible explanation of homeopathy—a form of alternative medicine usually considered a sham by mainstream scientists. It involves administering

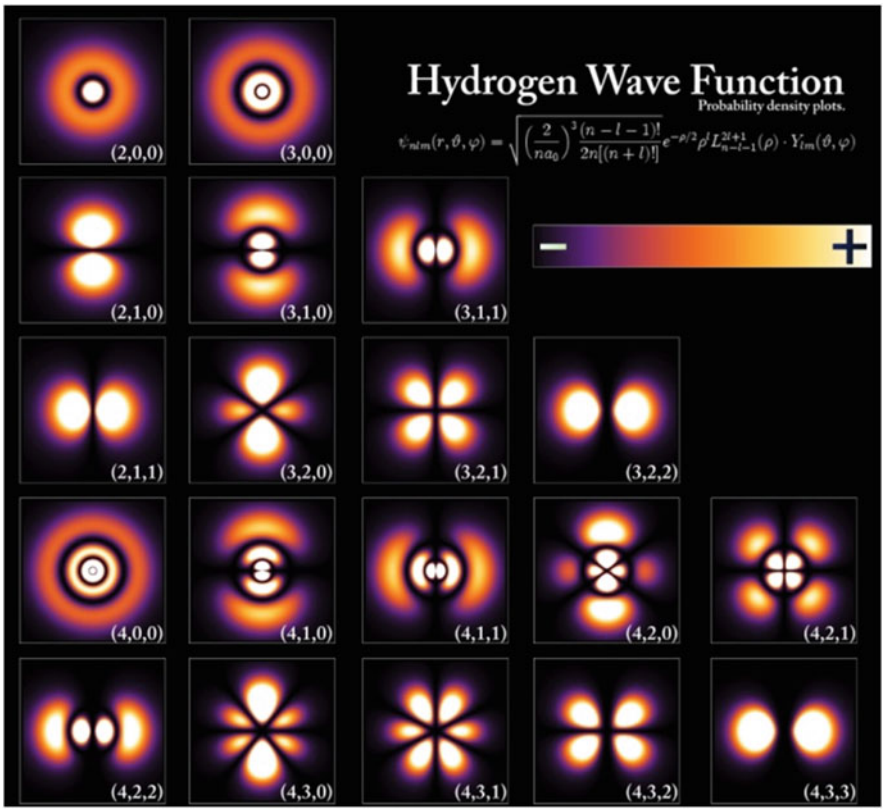

Fig. 3 Quantum physics is real science, but it is only concerned with phenomena on atomic or subatomic scales (public domain image)

chemicals that have been so heavily diluted that it is unlikely even a single molecule of the original substance remains. According to the water memory theory, the initial act of dissolving the chemical in water "programmes" the water molecules to vibrate at the same frequency—and hence to have the same effect—as the chemical itself.

This sounds like classic pseudoscience, but in 1988 the reputable science journal *Nature* published a paper describing a series of experiments which appeared to confirm the existence of a water memory effect [25]. The principal author of that paper was a French immunologist named Jacques Benveniste, and while his team reported convincing results these could not be replicated by other researchers. For this reason, most scientists—with the exception of a few mavericks like Brian Josephson—reject the concept of water memory.

Another professional scientist who took Benveniste's claims seriously was Cyril Smith, who taught electronic and electrical engineering at the University of Salford. He believed that water memory was part of a larger phenomenon of

"biological coherence", which was also capable of explaining seemingly paranormal abilities such as water dowsing. Smith's theories hover on the boundary between science and pseudoscience. Like many pseudoscientists (but few mainstream scientists) he was happy to invoke quantum theory as an explanation of phenomena on a macroscopic scale—in fact one of his key papers was entitled "Is a Living System a Macroscopic Quantum System?" [26].

Besides ostensibly paranormal effects such as dowsing and water memory, Smith believed his theories could explain the "electromagnetic hypersensitivity" experienced by certain people. This is a supposed consequence of the increasing amount of electromagnetic radiation in the environment, sometimes referred to as "electrosmog". According to Smith:

> It is usually found in patients who have already suffered chemical damage leading to a chemical hypersensitivity condition. Of present relevance is that their hypersensitivity extends to frequencies of vector potential in their environment and to frequencies imprinted into water or some other potentisable medium, the equivalent of a homeopathic remedy; such sensitivities are only explicable in terms of macroscopic quantum effects. [26]

From Dianetics to Psionics

Between 1935 and 1950, L. Ron Hubbard was a prolific writer of escapist adventure fiction. Today he is known around the world as the founder of the Church of Scientology, but at one time only the readers of certain pulp magazines would have been familiar with his name. He wrote science fiction for *Astounding* and fantasy for *Unknown*—the latter stories being light-hearted romps with titles like "Typewriter in the Sky", "The Case of the Friendly Corpse" and "Slaves of Sleep" (see Fig. 4).

Although there is no obvious indication of it in his fiction, Hubbard became increasingly interested in the subject of psychology. In May 1950 he published a book called *Dianetics: The Modern Science of Mental Health*, in which he put forward his own rather idiosyncratic alternative to mainstream psychology. In the same month, *Astounding* magazine—normally devoted to science fiction—ran a non-fiction article by Hubbard on the same subject: "Dianetics: The Evolution of a Science".

Hubbard's article is prefaced with a short introduction written by a medical doctor, Joseph A. Winter, who was one of the first converts to Dianetics. He explains that he was asked to provide a preface so "readers would not confuse Dianetics with Thiotimoline or with any other bit of scientific spoofing" [27]. Winter is alluding here to a deliberately pseudoscientific article published

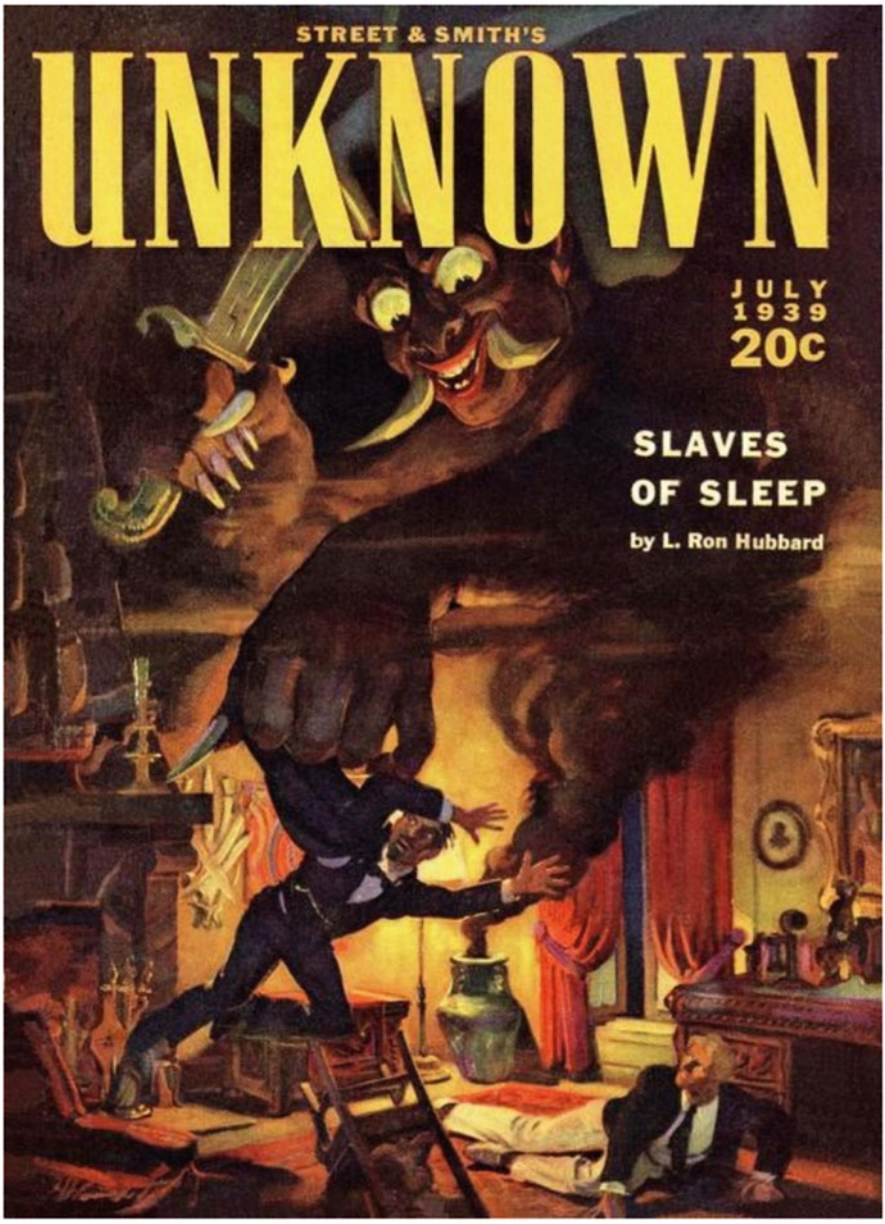

Fig. 4 The July 1939 issue of *Unknown* magazine, featuring L. Ron Hubbard's "Slaves of Sleep" (public domain image)

in the same magazine two years earlier, in March 1948. In a vague foreshadowing of the water memory affair, Isaac Asimov's "The Endochronic Properties of Resublimated Thiotimoline" described a substance that dissolved in water a second or so *before* the water was added [28].

The magazine's editor, John W. Campbell, also went out of his way to stress that Hubbard's article was the real thing, not pseudoscience. In his editorial to the May 1950 issue, he wrote: "This article is not a hoax, joke, or anything but a direct, clear statement of a totally new scientific thesis" [29].

Campbell explained the background to the publication of Hubbard's article in a private letter the following year:

> *Astounding Science Fiction* has long tried to spot at the laboratory stage the technical forces which will over the next decade or so have marked influence on the course of man's development. The article on Dianetics was published with that thought in mind. It was not published until I had personally investigated the practical results of Dianetics for over a year. [30]

Hubbard's book on Dianetics was a massive bestseller, quickly passing the million mark. However, his ideas met with such a stream of criticism from the psychological profession that he abandoned the idea of promoting Dianetics as a professional therapy. In 1954 he founded the Church of Scientology, using much the same principles as Dianetics but recast as a religious movement [31].

Two years after the creation of Scientology, in a letter written in 1956, John Campbell made the following rather surprising claim:

> It was, as a matter of fact, I, not Ron, who originally suggested that it [Dianetics] should be dropped as a psychotherapy, and reconstituted as a religion. Because only religions are permitted to be amateurs. [32]

Despite its creator's science-fictional background, Dianetics was looked on with horror by most other SF writers of the period. Isaac Asimov described it as "unscientific", while veteran author Jack Williamson called it "a lunatic revision of Freudian psychology" [33]. In 1954, Philip K. Dick wrote a satirical short story called "The Turning Wheel", featuring a mystical cult based on "the great legends of Elron Hu, who lived (according to legend) in the hideous days of the time of madness" [34]. It turns out that Elron Hu was a bard, and therefore not too different from L. Ron Hubbard!

Elsewhere in SF fandom, Dianetics met with greater approval. It was seen as part of a general encroachment of science-fictional ideas into the "real world". To quote Fred Nadis, the biographer of *Amazing Stories* editor Ray Palmer:

> By the 1950s, a group of SF fans had embraced what fan historian Harry Warner Jr dubbed "Psi-Fi"—a subgenre that mixed mainstream SF with interest in telepathy experiments, the Shaver Mystery, and, often, Dianetics. [35]

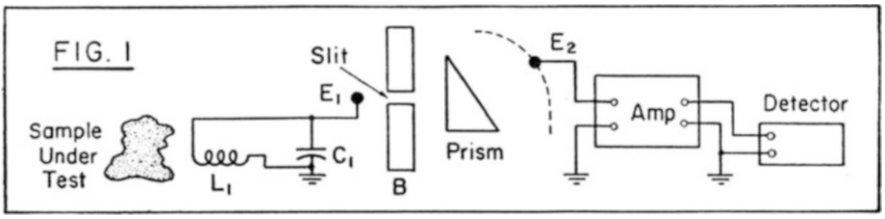

Fig. 5 John W. Campbell's schematic of the Hieronymus machine, from *Astounding Science Fiction*, June 1956. This "psionic device" was supposed to amplify subtle radiations from a test sample, resulting in a tingling sensation when a psychically sensitive individual touched the detector plate (public domain image)

If the Psi-Fi movement had a spiritual leader, then it was John W. Campbell, the editor of *Astounding Science Fiction*. His interest in psi-themed fiction, and his championing of Dianetics, have already been mentioned. Another of his interests was a subject he dubbed "Psionics"—or psychic electronics. Using his magazine editorials as a platform, he began to promote a peculiar device called the Hieronymus Machine, after its inventor Thomas Galen Hieronymus (see Fig. 5).

To quote Fortean author Mark Pilkington:

> The Hieronymus Machine has the unusual distinction of being the only psychically-operated—or psychotronic—device to have received a U.S. Patent. On September 27, 1949 it was awarded patent 2,482,773 for the "detection of emanations from materials and measurement of the volumes thereof". Hieronymus claimed that his invention could detect "Eloptic Radiation", a form of energy emitted by everything in our material world. [36]

Campbell built a Hieronymus Machine for himself, and was able to report to *Astounding* readers in June 1956 that:

> My direct observation is that his machine works, but not by application of any known physical principle. I believe Hieronymus has discovered and applied a new principle, but not the one he names in his theory. [37]

Two months later he had made a remarkable discovery—that the machine "works just as well when it is not plugged into the power supply as when it is" [38]. By the following year the situation was becoming distinctly surreal: "Reports coming in from various people indicate that workable, builder-scaringly successful models have been made from cardboard, plastic, Bakelite, rubber tiles, and sheet metal" [39].

If this is starting to sound like magic, that's exactly what Campbell believed it was. In a 1959 editorial, after commenting on the similarity of magical

traditions around the world, he wrote that: "The psi machines I've encountered work—and they work on precisely the same ancient laws of Magic that those wide-scattered peoples have, independently, accepted" [40].

While the Hieronymus Machine is long forgotten, its high-tech successors are still with us. Electronic bomb detectors that are supposed to work on a "dowsing" principle are the latest incarnation of the psionic machines John Campbell wrote about in the 1950s. In 2013, a British businessman was prosecuted for fraud after putting a product on the market that he claimed could detect explosives, banknotes, human bodies or any other object it was programmed for. The handheld device, called ADE 651, sold in its thousands to various security organizations around the world, but on investigation turned out to contain no workable electronics at all: it was effectively nothing more than a dowsing rod [41].

Feel the Force

Among the best known practitioners of "mind power" are the Jedi knights of George Lucas's *Star Wars* films. Their abilities come not from their own minds, but from the mysterious all-pervading Force. As Obi-Wan Kenobi explains to Luke Skywalker in the first film:

> The Force is what gives a Jedi his power. It's an energy field created by all living things. It surrounds us and penetrates us. It binds the galaxy together. [42]

The Force is, of course, entirely fictional. Nevertheless, a rumour spread during the 2001 census in the United Kingdom that if enough people listed their religion as "Jedi", the government would be forced to acknowledge its reality. In a sense, this actually happened—faced with thousands of forms marked "Jedi", the Office of National Statistics created a new classification category in order to file them properly [43].

George Lucas's fictional Force has a real-world counterpart in Wilhelm Reich's theory of "orgone energy". Reich began his career as a psychologist, and worked for a time with Sigmund Freud himself. Starting from Freud's ideas, Reich developed his own theory that mental illness originates from an inability to achieve orgasm [44]. He explained this in terms of a mysterious form of energy called "orgone".

Science fiction author John Sladek, in his highly sceptical non-fiction book *The New Apocrypha*, summarized the situation as follows:

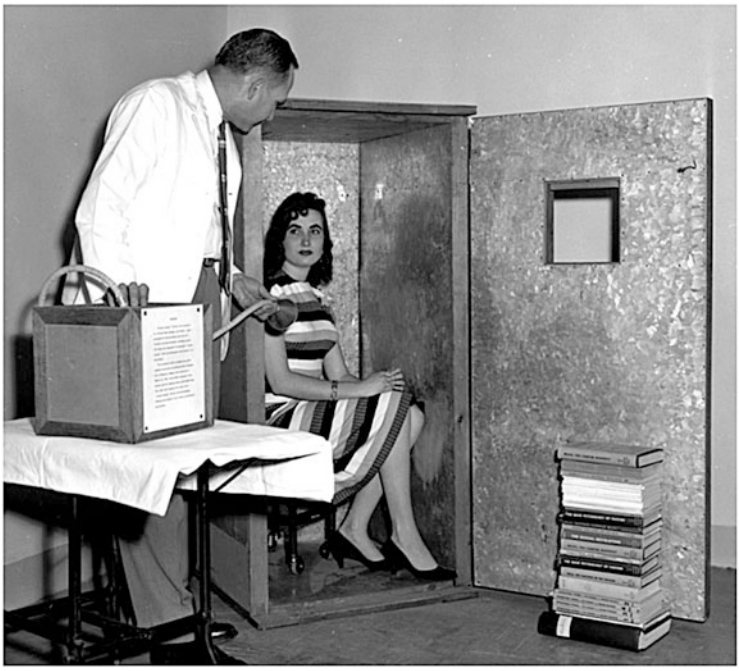

Fig. 6 An example of an orgone accumulator, as designed by Wilhelm Reich. The *box* was supposed to collect the "orgone energy" of the person seated inside (public domain image)

> Reich postulated a kind of energy discharge during orgasm, and he named it "orgone energy". It was blue. He claimed that it could be seen under a microscope, and detected by Geiger counters, thermometers and electroscopes. At the same time, orgone was altogether different from light, heat, electricity or radioactivity, which these instruments are made to detect. Only Reich and his disciples ever managed to observe and measure orgone energy by any method [45].

Although the idea of orgone originated in Reich's psychological work, he gradually extended its scope to that of a *Star Wars* style cosmic force. By the 1950s he had come to believe it was the fundamental building-block of the universe, explaining everything from the force of gravity and radio static to hurricanes and even UFOs [46].

Reich claimed that orgone could be collected and stored in an analogous manner to the storage of electrical energy in a battery. To this end, he invented a device called an orgone accumulator (see Fig. 6)—a box made from alternate layers of wood and metal that could supposedly collect the orgone of the person seated inside [46].

Despite its science-fictional aspects, orgone made little impact on the SF of the 1940s and 50s, when Reich's work was at the peak of its popularity. This could be due to its explicit sexual connotations—SF in those days was rarely "for mature readers only". In the literary world, however, it was a different matter. William S. Burroughs, the author of *Naked Lunch* and other avant-garde novels, made frequent references to orgone in his writings. In a letter to fellow novelist Jack Kerouac, Burroughs said of Wilhelm Reich: "The man is not crazy, he's a f——g genius" [47].

Reich's theory of orgone owes something to the mystical notion of "subtle energy fields" associated with the human body. This idea can be found in a number of occult traditions, both eastern and western [48]. It was put on an apparently scientific footing in the 1940s by Semyon and Valentina Kirlian, who discovered a method of photographing an "aura" surrounding living things. Their method used a high voltage electric charge instead of light to expose the photographic film, but it was soon shown to depict natural coronal discharges rather than anything mystical [49].

Nevertheless, devotees of Kirlian photography continued to maintain that the aura it shows is "real", and that its appearance varies with the emotional state of the subject. The science fiction writer A. E. van Vogt exploited this belief in his 1977 novel *The Anarchistic Colossus*. He posited a future society in which machines continuously monitor the Kirlian aura of the human population, and automatically detect any anti-social impulses the moment they occur. The machines can then sedate the person in question, thus averting a potential crime before it takes place. The essence of this idea was not original to van Vogt; he explains in the introduction to the novel that he based it on a real patent application filed several years earlier. He also admits the technique is unlikely to work—but is good enough "for story purposes" [50].

By the time he wrote *The Anarchistic Colossus*, Van Vogt was no stranger to the wacky world of pseudoscience. He had been one of the first converts to L. Ron Hubbard's Dianetics, and spent several years in the 1950s and 60s working as a professional Scientology auditor. One of his most famous novels, *The World of Null-A* (1945), was based on a precursor of Dianetics called General Semantics—a psychological self-improvement therapy developed by Alfred Korzybski in the 1930s [51].

Another fringe therapy that interested van Vogt was the "Bates method" for improving eyesight. Devised early in the 20th century by Dr William Bates, it was described by SF writer and sceptic John Sladek as follows:

> In the Bates system, all sight defects are caused by eye-strain, which is in turn caused by wrong thoughts. The cure is not to wear glasses, but to learn to see without strain, through eye exercises. [52]

Van Vogt's novel *Siege of the Unseen* (originally serialized in *Astounding* in 1946 as "The Chronicler") begins with the hero, Michael Slade, carrying out a series of eye exercises of the kind described by Bates, and for the same reason:

> *What the mind wants to see*, Slade thought, *it will see if it is there to see*. He was creating conditions where his mind would again want to see. [. . .] It was of the mind, his trouble. His eye had proved that it was able to function normally. [53]

Siege of the Unseen is science fiction, and as such Michael Slade differs somewhat from most practitioners of the Bates method. For one thing, in addition to the usual two eyes, he has a third eye in the centre of his forehead. Then, when he succeeds in repairing his vision, it is "like looking at two pictures, with one super-imposed on the other"—one image being the familiar world of Earth, the other a parallel reality. Before long he develops the ability to cross over into the other world—and finds that everyone there has three eyes like himself!

Homo Superior

James Blish's novel *Jack of Eagles* was mentioned earlier in this chapter. When its young hero Danny Caiden first encounters the villainous Sir Lewis Carter, the following dialogue ensues:

> The East discovered long ago that the psychic forces are not part of the space-time continuum . . .
> Are you now about to tell me that all this stuff was originally bequeathed to you from some ancient Tibetan lamasery?
> "No, I'm not," Sir Lewis said, flushing under his robe. "But I assure you that it is well known there." [54]

The automatic association of mystical powers with Tibet—or the Himalayan region in general—has long been a staple of genre fiction (see Fig. 7).

Fans of British cult television may know of a series called *The Champions*, which ran for 30 episodes in the late 1960s. This featured a trio of heroes who were, in the words of the opening narration, "endowed with the qualities and skills of super-humans . . . gifts given to them by the unknown race of people from a lost city in Tibet" [55].

A better known example is the Marvel Comics superhero Doctor Strange, created by Stan Lee and Steve Ditko in 1963. Doctor Strange is a "Master of the Mystic Arts", capable of levitation, astral projection, psychokinesis and

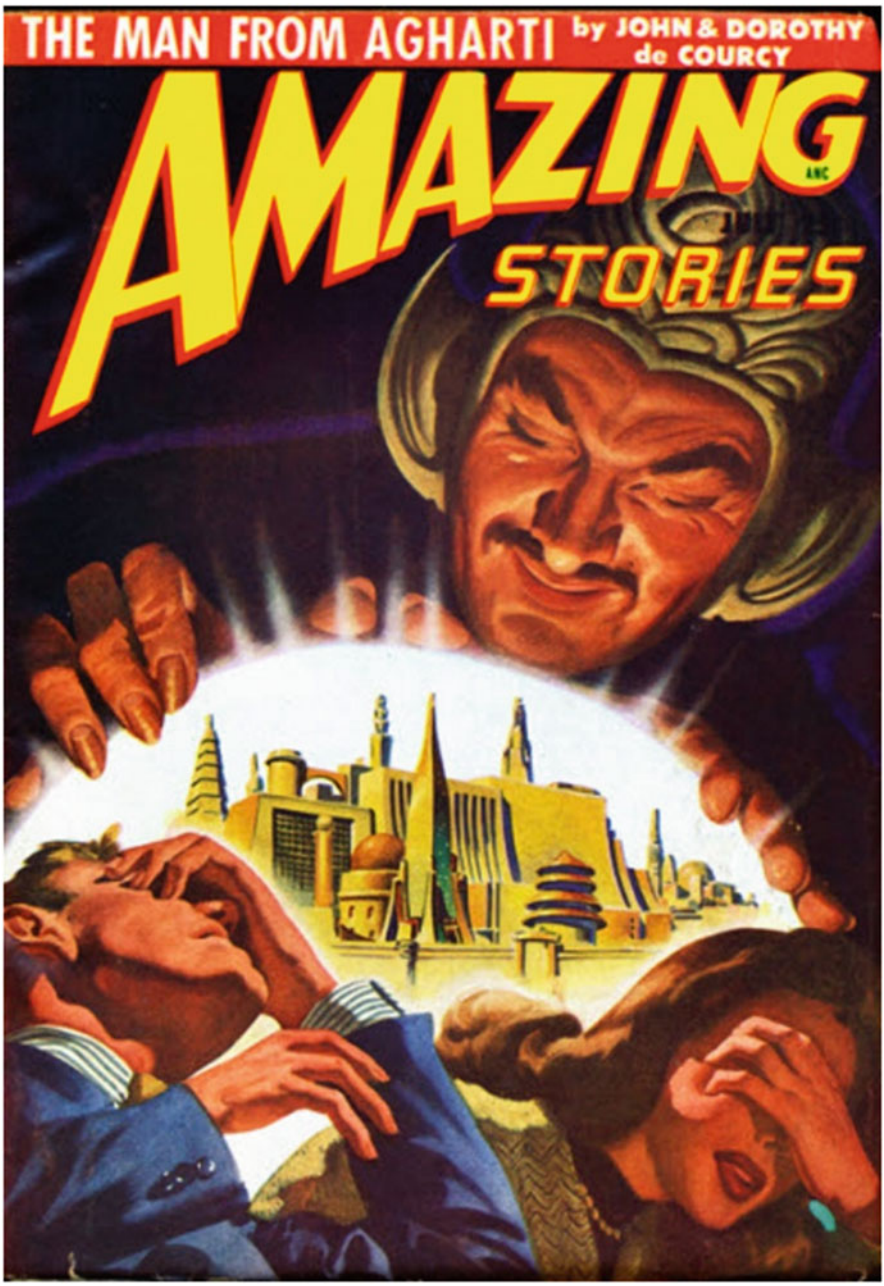

Fig. 7 "The Man from Agharti" in the July 1948 issue of *Amazing* was one of many stories featuring spiritually advanced civilizations in the Himalayas (public domain image)

many other feats. As with his British counterparts, these powers were acquired following a visit to the Himalayas—in the words of Ditko's biographer Blake Bell, "from a mythical figure spoken of only in whispers and shadows; a man from the mountains of India called the Ancient One" [56].

Fictional characters like Doctor Strange and the Champions had a real-world counterpart in the form of T. Lobsang Rampa, the author of numerous non-fiction books during the 1950s, 60s and 70s. According to *Fortean Times* editor Bob Rickard:

> They featured astral travel to other worlds, and a Himalayan cave full of machines made by an ancient civilization, including one which projected images from the past and the future. Rampa also lectured on Adam and Eve, the fictitious "Philadelphia Experiment", relativity theory, telepathy, levitation, psychic healing, lost Atlantis and Lemuria, etc. [57]

Rampa initially claimed to be a Tibetan Buddhist lama, but after investigators discovered he was actually a working-class Englishman named Cyril Hoskins, he explained the discrepancy in terms of the Buddhist theory of transmigration. His Tibetan body had died, he said, and its spirit had found a new refuge in Hoskins's body [58].

Rampa's first book was called *The Third Eye* (1956)—a reference to the belief that "opening the third eye" can unlock a person's latent psychic powers. The same idea is discussed in one of the seminal books of the New Age movement: *The Morning of the Magicians*, by Louis Pauwels and Jacques Bergier. This was originally published in French in 1960, with the English translation appearing three years later.

Writing in *Fortean Times* in 2011, Robert Guffey described *The Morning of the Magicians* as "one of the earliest and most successful books about occult conspiracies", and goes on to say:

> By the late 1960s, this particular book had become something of a cult sensation, inspiring SF writers such as Philip José Farmer, Michael Moorcock and William Kotzwinkle. [59]

Guffey makes another intriguing suggestion. The final chapter of Pauwels and Bergier's book, titled "Some Reflections on the Mutants", speculates on the possibility that, living secretly among *homo sapiens*, there are certain individuals who are further progressed along the evolutionary path—*homo superior*, in other words. To comic-book fans, this may sound very similar to the scenario portrayed in *The X-Men*, created by Stan Lee and Jack Kirby in 1963—the same year that the English translation of *The Morning of the*

Magicians appeared. It is Guffey's contention that this is not a coincidence, but a case of cause-and-effect.

Guffey was not the first person to make a connection between Pauwels and Bergier's speculations and *The X-Men*—the same point was made by Gary Lachman, a historian of popular culture, in his 2001 book *Turn Off Your Mind*. As Lachman also points out, the idea of mutants with extrasensory powers was a common theme of science fiction long before *The Morning of the Magicians* was written [60].

Pauwels and Bergier acknowledge that at least part of their argument comes from a science fiction writer—John W. Campbell—although it was articulated in one of his non-fiction articles rather than a fictional work. A potential criticism of the mutant theory is "if such beings were living among us, we should certainly see them". As a counter-argument, Pauwels and Bergier paraphrase a speculative article by Campbell entitled "We're Not All Human", published in the magazine he edited—*Astounding Science Fiction*—as long ago as September 1941:

> A man of genius, of the same species as ourselves—an Einstein, for example—publishes the fruits of his research. He attracts attention. . . . Above Einstein's level, the mutant is clever enough to conceal himself. He lives as discreetly as possible, and only tries to remain in contact with other intelligences like his own. [61]

A problem with *The Morning of the Magicians*—and with many other books in the same vein—is the sloppiness of its research. It has already been mentioned (in the chapter on "Anomalous Phenomena") how Pauwels and Bergier attribute the "exploding spaceship" theory of the Tunguska explosion to the Moscow Academy of Sciences, when in fact it originated in a science fiction story.

This is not an isolated error. One of their footnotes begins as follows:

> Professor Ralph Milne Farley, United States Senator and Professor of Modern Physics at the West Point Military Academy, has drawn attention to the fact that some biologists think that old age is due to the accumulation of heavy water in the organism. The alchemists' elixir of life might then be a substance that eliminates selectively heavy water. [62]

When the science fiction author John Brunner read this, he recognized it as "a bad summary of the plot of a novel called *The Immortals*, serialized in six parts in the American magazine *Argosy* beginning on 17 November 1934" [63]. The book was indeed published under the name of "Ralph Milne Farley", but this was the pseudonym of Roger Sherman Hoar—who was a

lawyer by profession, not a physicist. It is true that Hoar served as a senator, but only in the state senate of Massachusetts, not the United States Senate.

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Space Drives and Anti-gravity

Abstract Pseudoscientists and science fiction authors share a vested interest in breaking the laws of physics—whether it is Newton's law of gravity, Einstein's speed-of-light limitation, the conservation of momentum or the laws of thermodynamics. However, the motives in the two cases are quite different. SF writers want to create interesting stories; pseudoscientists want to take a stand against authority. To the latter the ultimate goal may be anti-gravity, free energy or perpetual motion; to the former it is more likely to be an antimatter-powered faster-than-light warp drive. This chapter compares and contrasts the two perspectives.

Breaking the Laws of Physics

Space travel on an interstellar scale is one of the staple elements of science fiction. The adventures of Captain Kirk in *Star Trek*, or Luke Skywalker in *Star Wars*, would be impossible without it. Unfortunately, there are a number of fundamental scientific principles that make such travel very difficult.

The first issue is simply one of scale. The distances between stars are measured in trillions of kilometres, which would involve impossibly long journey times if undertaken at ordinary speeds. As science fiction critic Peter Nicholls wrote in 1983:

> Visiting the stars means travel on an almost unimaginable scale. Today Apollo craft take three days to reach the Moon, approximately 375,000 km away. In 1973 it took Pioneer 10 twenty-one months to reach Jupiter. It will leave the Solar System in 1987, and if it were pointed at one of the nearest stars, Alpha Centauri (which it is not), it would take over 80,000 years to arrive. [1]

To increase the speed of a spacecraft requires acceleration, which in turn—according to Newton's Second Law of Motion—requires the application of a

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force. Force is perceived as "weight", with a person's normal weight under Earth gravity corresponding to an acceleration of 1g. Few people could withstand a sustained acceleration—possibly over weeks or months—significantly greater than 1g, so this places a practical limit on the speeds achievable by a real-world spacecraft.

Newton's Second Law is often stated in the form "$F = ma$", where a is the required acceleration and F is the necessary force. The third term, m, is the mass of the object being accelerated. It represents the object's inertia, or resistance to a change in motion.

Some early SF writers posited a hypothetical "inertialess drive", which was capable of reducing a spacecraft's mass to zero and hence neutralizing its resistance to acceleration. Such drives appear in the novel *Triplanetary* by E. E. Smith, originally serialized in *Amazing Stories* in 1934, and in Kenneth Robeson's "The Secret in the Sky" from the May 1935 issue of *Doc Savage* magazine.

These early treatments of inertialess drives assume that nullifying an object's mass would make it easier to accelerate and manoeuvre. That would be true if the inertial mass was reduced substantially, but not all the way to zero. However, acceleration and manoeuvre are impossible for an object with precisely zero mass. Such an object is constrained to move in a straight line at the maximum possible speed allowed by the laws of physics. As one of the characters explains in Isaac Asimov's short story "The Billiard Ball" (1967):

> Any massless object, such as a neutrino or a photon, must travel at the speed of light as long as it exists. In fact, light moves at that speed only because it is made up of photons. [2]

In the story, this basic consequence of Newton's laws of motion is exploited to humorous effect when a massless billiard ball is used as a murder weapon!

Newton's Second Law—that a force is needed in order to increase the speed of an object—is intuitive enough. His Third Law, on the other hand, is distinctly counter-intuitive. It states that, for a force to be applied to one object, that object must exert an equal and opposite force on some other object.

Taken together, Newton's second and third laws essentially state the conservation of momentum—one of the most fundamental principles in physics. An object cannot gain momentum unless another object acquires an equal and opposite momentum.

The simplest example of this is a rocket exhaust. If a spacecraft is "stationary", far away from the gravitational field of any planet or star, the only way it

can move forward is by forcing out exhaust gases in the opposite direction. The total momentum, of spacecraft pus exhaust, is still zero.

In the case of a conventional rocket, the exhaust happens to be the waste product of its energy-generating mechanism, but this is just a coincidence. The important thing is that the exhaust is "reaction mass"—and an absolutely indispensable part of spacecraft propulsion. A newer technology used for manoeuvring satellites in orbit is the ion thruster, which uses an electric field to propel a stream of ions in the opposite direction to the desired direction of travel. In this case the reaction mass is completely separate from the energy-producing mechanism. As science writer Brian Clegg says, "To make ion thrusters work you need to carry two substances—the atoms that will become ions and the power source for the electricity" [3].

Even if some microscopically small, infinitely powerful energy source was developed at some point in the future, the spacecraft would *still* require huge amounts of reaction mass in order to travel to the stars. It would in the real world, anyway. Fortunately, science fiction writers are less bothered by such considerations—otherwise most of their stories would never get written!

One of the easier ways to avoid the problem of reaction mass is to invoke another "Third Law"—not Isaac Newton's, but Arthur C. Clarke's. The famous SF author formulated his own set of three laws, of which the third states that "any sufficiently advanced technology is indistinguishable from magic" [4]. Ultimately, most science fictional space drives are just that—magic.

There is an unabashed example of this in Clarke's own novel, *Rendezvous with Rama* (1973). In the antepenultimate chapter, after the mysterious alien vessel that has been dubbed Rama finally activates its space drive, Clarke writes:

> As to the nature of that drive, one thing was now certain, even though all else was a mystery. There were no jets of gas, no beams of ions or plasma thrusting Rama into its new orbit. No one put it better than Sergeant Professor Myron, when he said, in shocked disbelief, "There goes Newton's Third Law". [5]

Pseudoscientists are no more bothered by the laws of physics than SF writers. One of the first amateur inventors to develop a "reactionless space drive" was Norman L. Dean, who was even granted a U.S. patent in 1959 for his "System for converting rotary motion into unidirectional motion" (see Fig. 1).

Science fiction critic Peter Nicholls described the Dean Drive in the following terms:

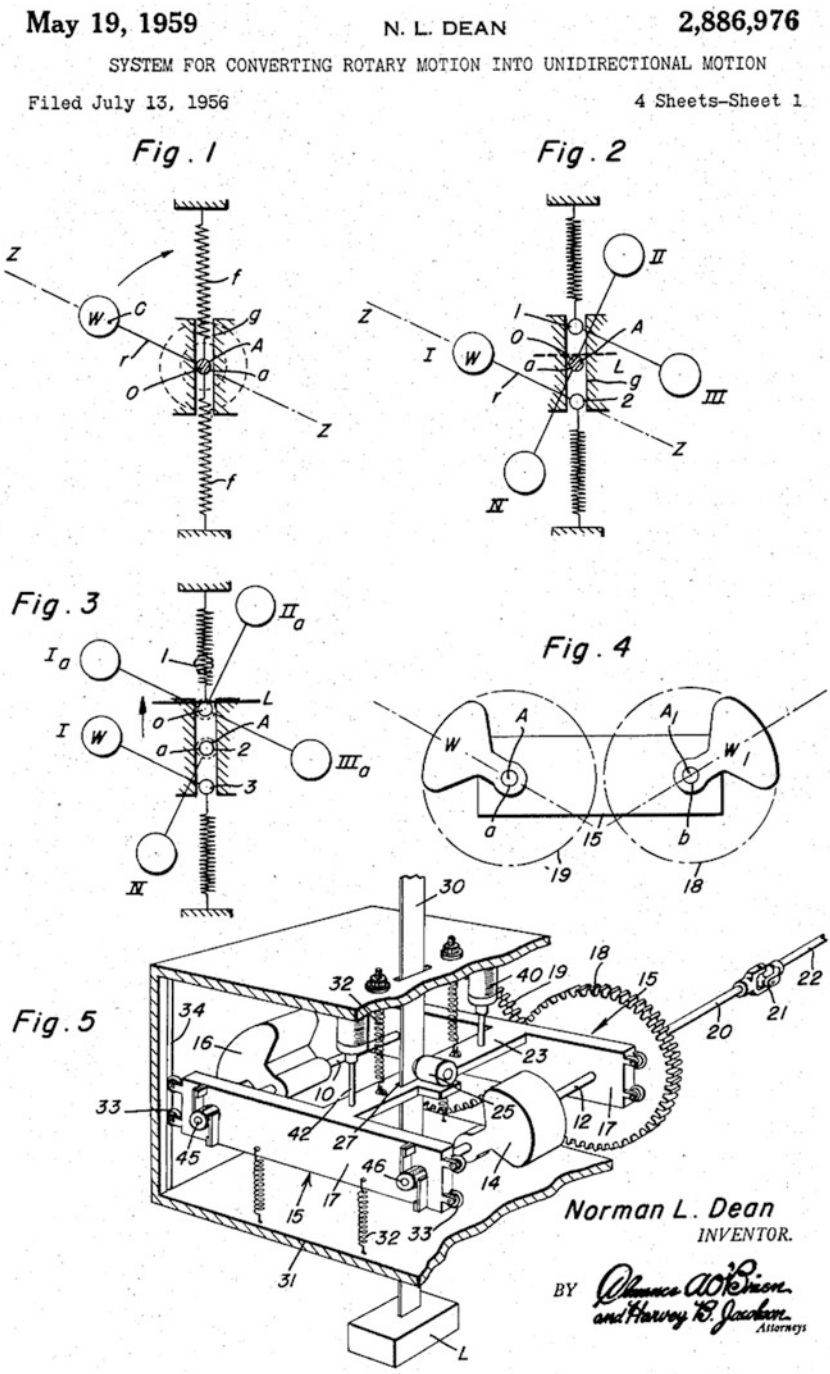

Fig. 1 The reactionless Dean Drive, which was awarded U.S. patent 2,886,976 (public domain image)

> This was a "reactionless drive", an unlikely device of wheels and levers which was supposed to move by pushing against itself—the mechanized equivalent of the man lifting himself by his bootlaces. Since this violates the law of conservation of momentum . . . scientists merely laughed at it. [6]

This last point—that scientists failed to take the Dean Drive seriously—particularly incensed SF editor John W. Campbell. In 1960 he changed the name of his magazine from *Astounding Science Fiction* to *Analog Science Fact & Fiction*, and shifted its emphasis from parapsychology to the hard sciences such as physics and astronomy. Several of Campbell's editorials in the early issues of *Analog* referred to the Dean Drive—not because he was convinced that it could do all the things Dean claimed, but because he felt it deserved more serious investigation than it was being given by the scientific establishment. As Campbell wrote in 1960:

> The principal point of the space drive problem, remember, was not the Dean Drive, or whether or not it worked. . . . The point was, nobody would look, and that under the doctrine, the philosophy, of the scientific method, someone with a working model has a right to demand investigation. [7]

This seems a fair enough point, and the case of the Dean Drive is echoed in a modern-day equivalent called the EmDrive. Originally developed by British inventor Roger Shawyer, the EmDrive is reputed to be able to do with trapped microwaves what the Dean Drive was supposed to do with springs and camshafts. Like the Dean Drive, however, the EmDrive met with considerable resistance from the scientific community, as David Hambling explained in *Fortean Times*:

> The EmDrive is a sealed cavity in the shape of a truncated cone filled with resonant microwaves shuttling back and forth. Classical physics says that no closed system can produce thrust . . . but whatever the theory, the real issue is whether the EmDrive actually works.
> Or at least, it would be if science worked like that. In practice, the weight of established physics presses down on anyone wishing to make this sort of claim, and the EmDrive was initially ignored. [8]

The few tests that have been carried out on the EmDrive—in China, Germany and the United States—do indeed appear to show that it can produce a small but measurable thrust in the absence of reaction mass. Whether this is an experimental aberration, or a genuine breakthrough in physics, remains tantalizingly unclear. In July 2015, for example, a team from the Technical University of Dresden reported preliminary test results using an EmDrive unit designed in cooperation with its inventor. Their results were ambiguous: "Our measurements reveal thrusts as expected from previous

claims . . . however also in directions that should produce no thrust". As such, they were forced to conclude that "our test campaign therefore can not confirm or refute the claims of the EmDrive", adding that "we identified experimental areas needing additional attention before any firm conclusions concerning the EmDrive claims could be made" [9].

Faster than Light

According to textbook physics, it is impossible to travel faster than the speed of light—approximately one billion kilometres per hour. To science fiction writers this is an inconvenient obstacle to galaxy-spanning adventures. To pseudoscientists, who hate being forbidden to do anything by the establishment, it is like a red rag to a bull.

To many people, the speed of light limitation sounds arbitrary, and thus easily capable of disproof. Unfortunately, it is more fundamental than that. It comes from Einstein's theory of relativity, which is essentially a theory of space-time. Speed is a measure of the spatial distance covered in a period of time, but in relativity the geometry of space and time are inextricably linked. The connecting factor is a fundamental parameter, *c*, which effectively imposes an absolute maximum speed on the universe. As mentioned earlier, photons of light happen to travel at *c* because they are massless, and therefore always travel at the highest speed possible.

Relativity is not all bad news, however. It leads to a strangely counter-intuitive effect called time dilation, which means that time passes more slowly for a person travelling close to the speed of light than for a stationary observer. Quoting Peter Nicholls again:

> If we travel one light-year at 99.99% of *c*, then from the viewpoint of someone watching the journey from Earth, the time taken will be a year plus about 53 minutes. At this speed, though . . . the ship's clocks are running at only 0.01414 times the rate of Earth clocks; so inside the ship the journey appears to take only five days and a few hours. [10]

By this argument, a spaceship could do the round-trip to Alpha Centauri—a total distance of approximately nine light-years—in less than two months. On returning to Earth, however, the crew would find that almost a decade had passed. At first sight this argument looks like a paradox, but closer analysis shows that it is perfectly valid [11].

Science fiction writers almost invariably ignore time dilation, even though in reality it would have a major impact on any interstellar voyage. One of the

few exceptions is L. Ron Hubbard's novel *Return to Tomorrow*. This was originally serialized as "To the Stars" in *Astounding Science Fiction* in 1950, just a few months before his book on Dianetics was published. Hubbard's novel even includes the mathematical formula for time dilation:

$$T_v = T_0 \cdot \sqrt{1 - \frac{v^2}{c^2}}$$

where T_0 is Earth-time and T_v is ship-time [12]. This equation is the key to the whole novel. The young protagonist is a crew member on a spaceship, which travels at a speed v so close to c that every time he returns to Earth, after a few months of subjective time, everyone he met on the last visit is either dead or senile. This makes *Return to Tomorrow* a depressingly downbeat novel—and probably explains why so few SF writers have chosen to follow in Hubbard's footsteps.

A more common convention in science fiction is to use the sheer power of technobabble to overcome the limitations imposed by relativity. The best-known example of this is the warp drive of *Star Trek*. When it was first mentioned on the show in 1967, "warp drive" was just a pseudoscientific phrase that sounded reasonable but had no meaningful theory behind it.

Ironically, however, this led to one of the few instances of science fiction inspiring a genuine piece of scientific research. In 1994, the reputable science journal *Classical and Quantum Gravity* published a paper called "Warp Drive: Hyper-Fast Travel Within General Relativity". Written by Miguel Alcubierre, a theoretical physicist and self-confessed *Star Trek* fan, the paper proposes a possible mechanism for a real-life warp drive consistent with Einsteinian relativity (see Fig. 2).

Alcubierre's idea was summarized by Brian Clegg as follows:

> The device would contract space-time in front of the ship and expand it behind, pushing the ship forward at speeds that are potentially far faster than that of light. This is possible because ... relativity does not apply to the expansion and contraction of space and time itself. In effect, the ship would not move at all, it would change the nature of space-time around it. [13]

While Alcubierre's drive is consistent with the laws of physics, it is far from becoming a practical proposition any time in the foreseeable future. As Brian Clegg put it, "its demands for energy were beyond anything conceivable".

Another word that occasionally crops up in science-fictional treatments of faster-than-light travel is "hyperspace". This is a well-established term in mathematics, and simply refers to any hypothetical space with more than

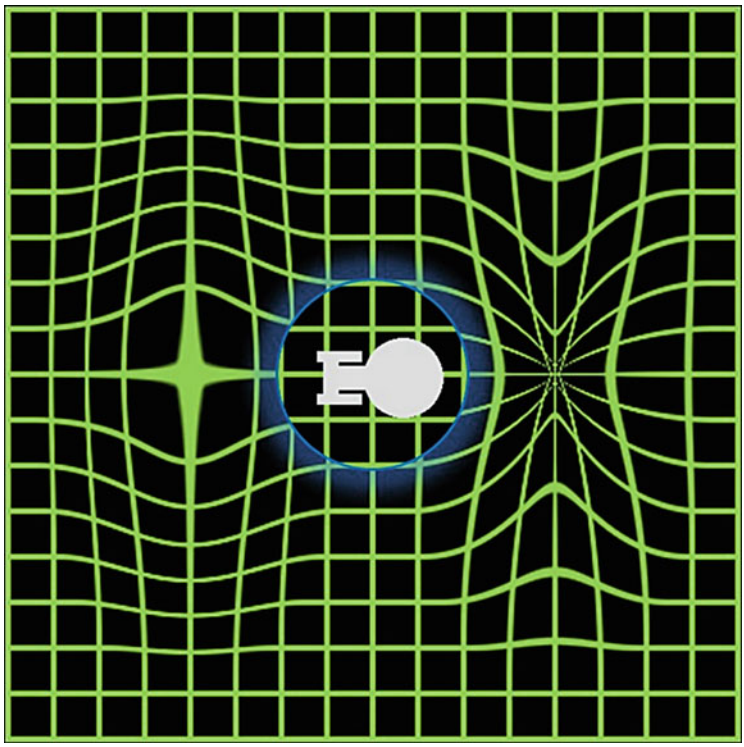

Fig. 2 Artist's impression of Alcubierre's "warp drive" (public domain image)

three dimensions. For example, a "hypercube" is an imaginary four-dimensional object that stands in the same relation to a three-dimensional cube as a cube does to a two-dimensional square.

Even before the idea of hyperspace was snatched up by SF writers for the purposes of interstellar travel, it was a subject of fascination for many people. As science writer Michio Kaku says: "The concept of hyperspace has intrigued artists, musicians, mystics, theologians and philosophers" [14]. One example he cites is the painting *Corpus Hypercubus* (1954) by Salvador Dalí, showing "Jesus Christ crucified in front of an unravelled four-dimensional hypercube".

A phrase commonly encountered in science fiction is "hyperspace jump"—the method by which, for example, Han Solo's Millennium Falcon beats the speed-of-light limitation in *Star Wars*. Fictional treatments often give the impression that a spaceship can switch back and forth between ordinary space and hyperspace, with distances between any two points being significantly shorter in the latter case. Unfortunately this idea is pure fiction, with no correspondence to any serious model of the way the universe is constructed [15].

On considerably firmer ground is the idea of "wormholes", or short-cuts from one space-time location to another. At a conceptual level such features are consistent with Einstein's theory of relativity, and indeed were first postulated by Einstein himself [16]. No less a person than world-renowned physicist Stephen Hawking said:

> Wormholes, if they exist, would be ideal for rapid space travel. You might go through a wormhole to the other side of the galaxy and be back in time for dinner. [17]

If wormholes do exist, they are unlikely to be as user-friendly as those depicted in science fiction. An extreme example can be seen in the 1994 film *Stargate*, where the eponymous "stargate" is a convenient size for humans to step through, with one end located on Earth itself and the other on an equally habitable planet.

Anti-gravity

For a long time, the idea of "anti-gravity" has been used to symbolize pseudoscience in general. It is not obvious why this is, but part of the reason may lie in the fact that another meaning of the word gravity is "seriousness". The opposite of gravity in this sense is "levity", or frivolity. Perhaps for this reason, the term "anti-gravity" is as likely to turn up in a humorous context as a serious one (see Fig. 3).

Hugo Gernsback was mentioned in "Charles Fort and the Forteans", both as the "father of science fiction" and as editor of the non-fiction magazine *Science and Invention*. In September 1927, the latter magazine ran an apparently factual article headlined "Gravity Nullified: Quartz crystals charged by high frequency currents lose their weight". The illustrated article went into considerable detail about the discovery, said to have been made "in a newly established laboratory" in Poland, and concluded with the injunction "don't fail to see next issue regarding this marvellous invention".

When the next issue duly came out, it carried a follow-up article by Gernsback revealing that the first piece had been a hoax, and pointing out various clues the reader should have spotted. Both articles were reprinted by pseudoscience expert David Hatcher Childress in his *Anti-Gravity Handbook*, together with an analysis of "apparent inconsistencies" in Gernsback's explanation of the hoax—implying that this was the real hoax, while the original article had been factually correct [18].

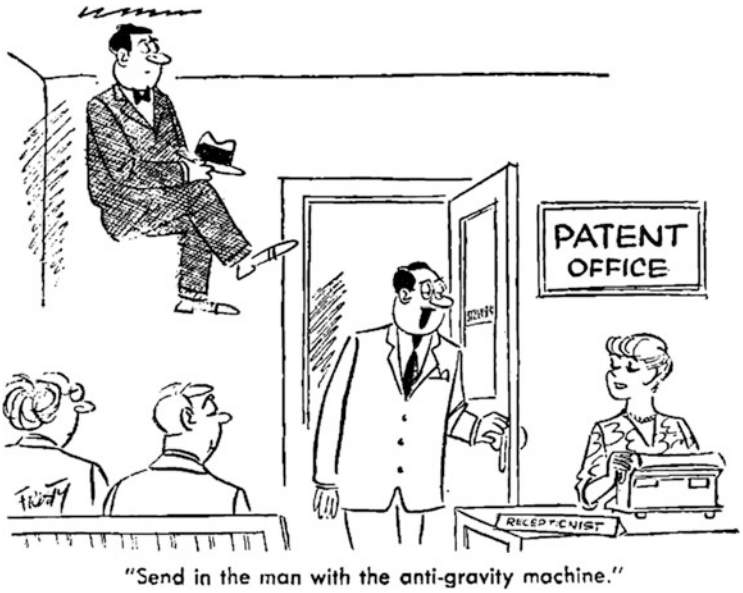

Fig. 3 "Anti-gravity" is often portrayed humorously, even in science fiction, as in this cartoon from the August 1961 issue of *Fantastic Stories of Imagination* (public domain image)

Pseudoscientists often fall for hoaxes, partly because they make no secret of what it is they "want to believe". Any practical joker presenting them with appropriate evidence is likely to be welcomed with open arms. This situation was satirized by Arthur C. Clarke in a short story called "What Goes Up", first published in 1956. It is part of a series Clarke wrote about a group of scientists and science fiction authors who meet up at a public house called The White Hart [19].

This particular story starts with "one of the leading exponents of the Flying Saucer religion" gate-crashing the White Hart, under the mistaken impression that the regulars would be UFO believers like himself. Instead, they regale him with a comically far-fetched anecdote about the discovery of anti-gravity at a research establishment in Australia. Unfortunately, like many ufologists and pseudoscientists past and present, the visitor is completely immune to irony. The White Hart regulars are amazed to see the exact same story in the following month's issue of *Flying Saucer Revelations*, printed as straight fact!

During the 1950s the subject of anti-gravity was quite often mentioned in conjunction with Flying Saucers, both by believers and sceptics. To the latter, the two were equally symbolic of unscientific nonsense, while to the ufologists themselves they both symbolized advanced alien technology.

In 1954, the British UFO researcher Leonard Cramp published a book called *Space, Gravity and the Flying Saucer*. Although he draws sweeping conclusions on the basis of very little evidence, he does make one interesting point—which he attributes to Arthur C. Clarke himself, who was Chairman of the British Interplanetary Society at the time. As mentioned at the start of this chapter, one of the strongest arguments against the feasibility of interstellar travel is that enormous accelerations would be needed to reach the required speeds, and there is no way the human body could withstand such accelerations.

Actually there is one way—if the forces producing the acceleration act on every single atom to the same extent. This is what happens when a person is falling freely under gravity—there is no sensation of a force because gravity acts on all parts of the body equally. So Clarke's argument, which Cramp snapped up enthusiastically, is that a "gravity-drive" spaceship could accelerate at any desired rate without harming its occupants. Cramp convinced himself this is what powered flying saucers [20].

Very few ufologists pretend to know anything about the mechanics of UFOs. This is not unreasonable, since most people accept all kinds of real-world technology without worrying about how it works. In fact, a UFO witness who said they understood the nuts and bolts of UFOs might be harder to believe than one who did not.

One person who did claim to know how UFOs worked was a young American engineer named Bob Lazar. In 1989, he came forward with the story that a number of alien spacecraft had been captured and were being analysed at a secret base in the Nevada desert. Like Leonard Cramp, he claimed these vehicles made use of a "gravitational propulsion system", about which he gave a number of specific details. The general reaction in the aerospace community was that Lazar's claims were "a fantastical hoax" [21].

The very fact that anti-gravity is so susceptible to jokes, hoaxes and wild speculations makes it difficult for scientists to study it a serious level. Even when they do so, they may be seen as "bringing their organization into disrepute". When Dr Ron Evans, an engineer working for one of the world's leading aerospace companies, began a small exploratory study on the subject, the business column of a major British newspaper gleefully reported that the company "is investing in an anti-gravity machine. Of course, any fool knows such machines cannot exist; they break nature's laws" [21].

As mentioned several times already, the editor of *Astounding Science Fiction*, John W. Campbell, was an outspoken critic of entrenched attitudes of this kind. This was why he took such an interest in "unscientific" devices such as the Hieronymus machine and the Dean Drive, and why he published so many stories about ESP and other paranormal powers. In 1952, he printed a story

called "Noise Level" by Raymond F. Jones, which posits an intriguing solution to the anti-gravity problem. Not the scientific problem, that is, but the sociological problem of getting scientists to take the subject seriously.

The story begins with a group of scientists at a military research laboratory being shown a top secret videotape. This depicts a young man named Dunning demonstrating an "antigravity belt" he has just invented. The belt appears to work, lifting Dunning off the ground and allowing him to fly around for several minutes. Then the belt fails, causing Dunning to fall to his death. The scientists are told it is their job to recreate Dunning's invention.

Unfortunately Dunning was paranoid about secrecy, and he left no specific notes as to his method. The scientists are given full access to his laboratory—which is bewilderingly chaotic—and his library. To their astonishment, the latter contains books on subjects like astrology, mysticism and religious miracles as well as scientific journals and textbooks. One of the older scientists carries out a careful mathematical analysis, concluding that Dunning's discovery conflicts with one of the fundamental postulates of Einstein's theory of relativity. Unable to reconcile this fact with the video of Dunning's feat, the man loses his mind and has to be confined to a sanatorium.

The younger men, however, realize the only possible explanation is that Einstein's postulate is wrong. Having accepted this fact, they are able to develop their own crude anti-gravity machine—although it is nothing like as compact or impressive as Dunning's belt. As soon as they have demonstrated their machine to their military bosses, they are told the staggering truth. The video was a hoax, Dunning was an actor, and the whole thing was a psychological experiment to see how they would respond to "evidence" that conflicted with their world-view! [22]

Free Energy

Not content with breaking Newton's laws of motion, or his law of gravity, pseudoscientists also enjoy breaking the laws of thermodynamics. This is the time-honoured practice of designing perpetual motion machines (see Fig. 4), which conflict with either the first or second law of thermodynamics [23]. In simple terms, such devices "get something for nothing".

Ironically, part of the original motivation for formulating the laws of thermodynamics, back in the 19th century, was a desire to "debunk" the perpetual motion fanatics [24]. As *The Mechanic's Magazine* wrote in 1848:

> A more self-willed, self-satisfied, or self-deluded class of the community it would be impossible to imagine. They hope against hope, scorning all

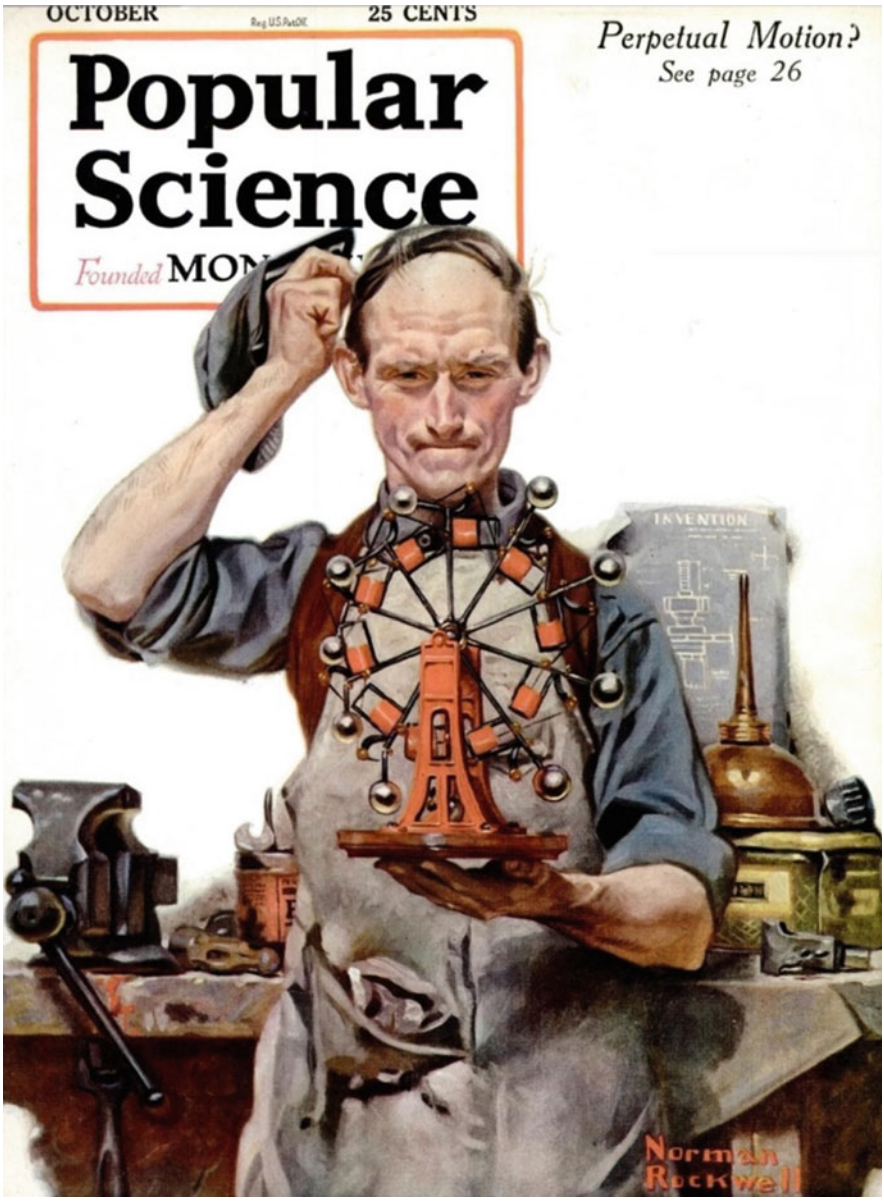

Fig. 4 The cover of *Popular Science* magazine for October 1920, depicting an archetypal "perpetual motion" inventor (public domain image)

> opposition with ridiculous vehemence, although centuries have not advanced them one step in the way of progress. [24]

The same description could apply to many pseudoscientists today, although they are more likely to talk about "free energy devices" rather than perpetual

motion machines. Of course, there is nothing cranky about free energy *per se*. Solar energy is free, as is wind energy. However, capturing such energy and converting it into a useable form is what costs money—and the same is likely to be true of any more exotic form of "free energy" that is discovered.

Free energy enthusiasts often talk about "vacuum energy", also known as "zero-point energy". This is a real consequence of quantum theory, which shows that the lowest energy state of empty space is non-zero. However, it is called "zero-point" for a good reason: it is the lowest possible state, and hence zero for all practical purposes. Extracting energy from it would mean reducing it to a lower energy level, which is impossible by definition [25].

Nit-picking like this is never going to deter the pseudoscientists. As journalist Nick Cook says in his book *The Hunt for Zero-Point*, paraphrasing a zero-point believer:

> It was theoretically possible to draw some—perhaps a lot—of that energy from our everyday surroundings and get it to do useful work. If it could be "mined"—both on Earth and in space—it offered an infinite and potentially limitless energy source. [26]

The idea of plucking energy out of empty space is particularly attractive for anyone wanting an interstellar space drive. Arthur C. Clarke invokes this very idea for the "quantum drive" described in his novel *The Songs of Distant Earth* (1986). He puts its discovery no less than 1500 years in the future, by which time "the long record of failure had convinced almost everyone that tapping the energies of space was like perpetual motion, impossible even in theory, let alone in practice" [27].

In his introduction to the novel, Clarke admits that:

> The only really wild extrapolation is the "quantum drive". . . . Should it turn out to be a pipe-dream, there are several possible alternatives; and if we twentieth-century primitives can imagine them, future science will undoubtedly discover something much better. [28]

One of the "possible alternatives" Clarke refers to could be the notion of extracting energy from a completely different universe. As in the case of vacuum energy, a parallel universe is something physics acknowledges may exist, but offers no practical mechanism for interacting with. That does not stop speculation, though. Isaac Asimov proposed an intriguing source of "free energy without limit" in his novel *The Gods Themselves* [29]. This was written in 1972, at a time when the world was first coming to grips with the idea that fossil fuels were finite and sooner or later an alternative energy source would be

needed. Asimov's solution was elegant enough to catch the interest of physicist Michio Kaku, who summarized the novel's premise as follows:

> Ordinary tungsten-186 is strangely being converted into a mysterious plutonium-186, which has too many protons and should be unstable. . . . This strange plutonium-186 comes from a parallel universe where the nuclear force is much stronger, so it overcomes the repulsion of the protons. Since this strange plutonium-186 gives off large amounts of energy in the form of electrons, it can be harnessed to give fabulous amounts of free energy. [30]

Although both pseudoscientists and science fiction authors are interested in alternative energy sources, the reasons for their interest are different. SF writers need very large amounts of energy—much more than could be obtained by conventional means—to power interstellar spaceships and other high-tech hardware. In the case of pseudoscientists, on the other hand, the important thing is not the quantity of energy produced but who controls that energy. For them, the issue is a political one, of governments and big corporations versus the individual. The existence of "free energy" would liberate the individual from state and corporate control.

Even this idea, however, has cropped up in SF. In March 1947, *Astounding Science Fiction* printed a novella by Jack Williamson entitled "The Equalizer". This concerns the discovery of a small gadget that anyone can make—"a piece of thick copper wire, shaped into a double coil of oddly-shaped loops at odd-seeming angles, and held in shape with a transparent plastic rod"—that generates electricity out of thin air. As the title suggests, the story focuses on the democratizing effect such an invention would have [31].

Present-day free-energy enthusiasts are less likely to be concerned with twisted loops of wire than with test-tubes filled with water. The idea that energy could be extracted from ordinary tap-water, in a table-top device at room temperature, goes back to March 1989. A press release issued by Martin Fleischmann and Stanley Pons of the University of Utah claimed the two experimenters had done just that. Their discovery was dubbed "cold fusion", because it appeared to involve a process of nuclear fusion—which, according to theory, can only take place at extremely high temperatures.

Other academic institutions were unable to duplicate the Fleischmann-Pons effect, and the scientific community concluded it was the result of fraud, incompetence or both. For pseudoscientists, on the other hand, the lure of free energy is far too great to ignore. As Fortean author Mark Pilkington wrote, "a worldwide cold fusion underground has sprung up in the aftermath of the original debacle" [32].

Real nuclear fusion—the kind that occurs inside the Sun and other stars—is one of the most powerful energy production mechanisms known. Yet it is far from being the most powerful imaginable. The absolute maximum energy that can be extracted from mass m is given by Einstein's famous formula $E = mc^2$. In these terms, nuclear fusion is less than 0.7 per cent efficient, extracting just 4 kg worth of energy from every 600 kg of raw material [33]. In contrast, another "real" process—the mutual annihilation of matter and antimatter—is 100 per cent efficient.

Antimatter, of course, is what provides the energy source for the warp drive in *Star Trek*. While the physics of matter-antimatter annihilation is genuine enough, there is a practical obstacle to its exploitation in that antimatter is an extremely difficult substance to synthesize. It requires massively expensive particle accelerators, and currently only a few millionths of a gram are produced each year [34].

A few micrograms of antimatter would not be enough to power a jet airliner, let alone a starship. The best-selling author Dan Brown—never a great stickler for facts—stretched the situation to more dramatic proportions in his novel *Angels and Demons* (2000). He has the villain steal, not just a few micrograms, but a full quarter of a gram of antimatter from the Large Hadron Collider [35]. The villain's aim is not to power a starship, or anything else, but to create a highly compact bomb.

This raises an important issue, which is all too often neglected both by pseudoscientists and SF authors. In the eagerness of the latter to power space drives, and of the former to liberate the masses from corporate greed, they tend to overlook the fact that any new source of energy can—and probably will—be turned into a weapon. One person who was fully aware of this fact was the patron saint of pseudoscientists, Nikola Tesla.

Tesla Technology

Nikola Tesla was an inventor and long-time adversary of his more famous contemporary, Thomas Edison. Best remembered for his pioneering work on alternating current electricity, Tesla invented a practical method for transmitting AC power over long distances, as well as the first AC motor [36]. He later became obsessed with the idea of transmitting power from one point to another without the use of wires. There is no hard evidence that he ever succeeded in doing this, although many of his supporters are convinced that he did. Emerging as an offshoot of this work was the spectacular device known as a Tesla coil, which effectively generates artificial lightning [37].

In the world of pseudoscience, Tesla has become something of a myth. Part of the reason is that some of his inventions unquestionably worked, forcing even the most conservative scientists to admit that Tesla deserves his place in history. On top of that, he made extravagant but unsubstantiated claims for many other, far more exciting, inventions—including such things as antigravity [38] and time travel [39]. He also believed in a concept he called "universal energy"—a precursor of the vacuum or zero-point energy discussed earlier in this chapter—which would allow electrical power to be drawn from empty space [37].

Tesla also came to believe, as early as the 1920s, that technology would transform the future of warfare. In general terms, of course, he was quite correct—although Tesla was not thinking of guided missiles, radar or atomic weapons. He was more interested in death rays (see Fig. 5).

Although the term "death ray" sounds like a rather corny sci-fi concept today, back in the early 20th century it was taken much more seriously. Tesla was far from being the only person who believed that a lethal effect could be obtained by projecting powerful radio waves. The popular author Agatha Christie, best known for her mystery novels, never turned her hand to science fiction. Yet a "death ray" features in one of her early novels, *The Big Four* (1927), featuring her famous private detective, Hercule Poirot. As one of the characters, an American secret service agent, explains:

> You may remember reading, Monsieur Poirot, that a number of torpedo boats and destroyers were sunk by being dashed upon the rocks off the American coast. . . . Now, a short time ago, a round-up was made of certain crooks and gunmen, and with them were captured some papers which put an entirely new face upon the matter. They appeared to refer to some organization called the "Big Four", and gave an incomplete description of some powerful wireless installation—a concentration of wireless energy far beyond anything so far attempted, and capable of focusing a beam of great intensity upon some given spot. [40]

The fact that such an idea cropped up in a popular detective novel implies that it was common currency at the time, not fanciful science fiction. A few years later, in 1935, the British Air Ministry asked a scientist named Robert Watson-Watt to investigate "the practicability of proposals of the type colloquially called death ray". Watson-Watt quickly determined that it was impossible to project enough radio energy at an aircraft to destroy it in flight. Far more promising, he believed, was the use of such "rays" to detect aircraft beyond visual range, by looking for the reflected radio energy. This led to the

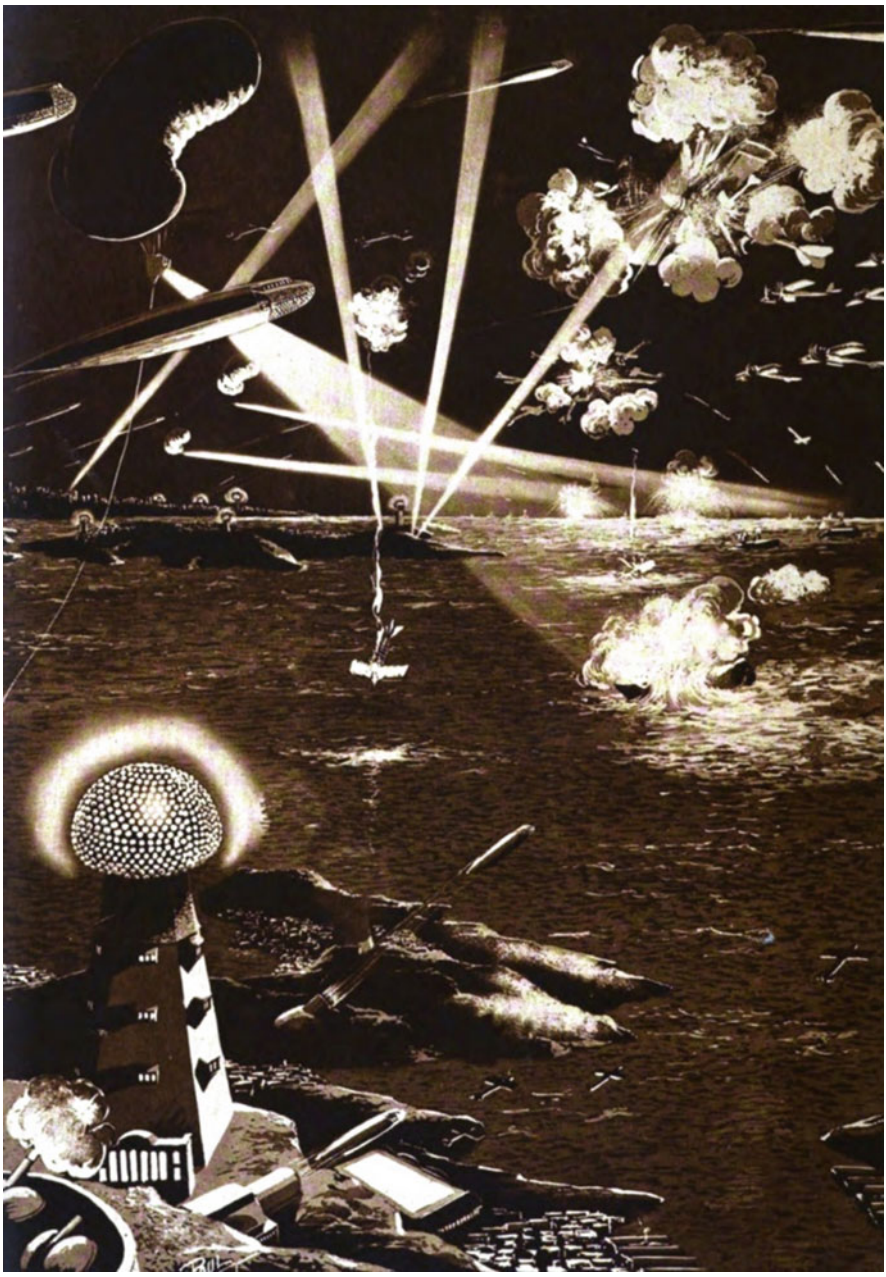

Fig. 5 Artist's rendering of Tesla's vision of future war, from *Science & Invention*, February 1922 (public domain image)

development of radar, which ended up transforming air warfare almost as much as a death ray would have [41].

With Tesla's interest in the wireless transmission of electrical power, it is not surprising that he considered turning this same technology into a "death ray". While he never seems to have given a public demonstration of such a weapon, it is a concept he often talked about. Towards the end of his life, he started referring to a discovery he called "teleforce", whose potential he described in the following terms:

> It will be possible to destroy anything approaching within 200 miles. My invention will provide a wall of power. [42]

As with many of Tesla's extravagant claims, this was almost certainly a case of massive over-enthusiasm on his part. Although he was a talented inventor, his grasp of the theory underlying his inventions was relatively poor. As Brian Clegg pointed out: "What Tesla actually did was to promise to deliver systems over and over again that never worked and never would work, because he didn't understand the underlying physics" [43].

Pseudoscientists, who neither understand nor care about underlying physics, are undeterred by such considerations. They make no distinction between those aspects of Tesla's work that are well-documented and repeatable, and those that are not. Since the latter—involving such things as anti-gravity, free energy and miraculous weapons—are generally more exciting than the former, they are the ones that get most of the attention. As Mark Pilkington put it: "After his death, Tesla was adopted by kooks from every wavelength of the paranormal spectrum" [44].

Inevitably, Tesla has also cropped up in various works of fiction over the years. As early as 1941, when the 85-year old inventor was still alive, the comic-book hero Superman encountered a mad scientist named Tesla in his very first animated adventure [44]. As in the case of J. B. Rhine and extrasensory powers, or Charles Fort and anomalous phenomena, authors took to invoking Tesla's name in order to add credibility to an otherwise far-fetched story.

Tesla actually appears as a character, played by David Bowie, in Christopher Nolan's period film *The Prestige* (2006). The film's anti-hero commissions Tesla to create a machine that can duplicate anything, including a living human being—something even the real Tesla never claimed to be able to do. The script gives Tesla some lines that one can actually imagine him saying, such as "nothing is impossible" and "exact science ... is not an exact science" [45].

Stretching reality even further is Paul Malmont's 2011 novel *The Astounding, the Amazing and the Unknown* [46], set during the early years of World War Two. The novel is a kind of metafiction, with many of the principal characters being SF writers and editors of period—people like John W. Campbell, Isaac Asimov, L. Ron Hubbard and Hugo Gernsback. Tesla himself died a decade before the action takes place, but the protagonists are trying to unravel the secret of a "wonder-weapon" he is said to have created. There are strong hints that Tesla's weapon was responsible for the Tunguska explosion in 1908, and that the so-called Philadelphia Experiment of 1943 was an attempt to recreate it. Outrageous as these ideas are, neither of them is original to Malmont's novel—they are both common currency among Tesla enthusiasts on the internet.

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Technology of the Ancients

Abstract One of the recurring themes of pseudoscience is the belief that, thousands of years in the past, Earth was home to a technologically advanced civilization. Some authors attribute this to a lost continent such as Atlantis, others to extraterrestrial visitors who were perceived as "gods" by primitive humans. As well as offering comforting myths about the superiority and importance of *homo sapiens*, such beliefs provide neat explanations of historical oddities such as the legendary flying machines of ancient India or the UFO-like vision of Ezekiel. So beguiling are such ideas that they often seep over into popular culture, everywhere from *Dr Who* to Marvel comics, and from *Raiders of the Lost Ark* to *2001: A Space Odyssey*.

Ancient Astronauts

One of the all-time best-sellers of ufology was the book *Flying Saucers Have Landed* (1953), co-written by Desmond Leslie and George Adamski, which sold over a million copies during the 1950s [1]. It is really two books in one: the first two-thirds a theoretical speculation on the nature of UFOs by Leslie, and the last third Adamski's first-hand account of his own encounters with flying saucers. The latter was the reason for the book's popularity, although with hindsight the former may be even more interesting.

Desmond Leslie was a fascinating individual. A cousin of the British Prime Minister, Winston Churchill, he served as a fighter pilot during World War Two. Later he became interested in mysticism and the occult, and wrote novels and screenplays—including a now-forgotten sci-fi B-movie called *Stranger from Venus* (1954) [1].

While many authors had written about UFOs before Leslie, he introduced a whole new dimension to the subject. He realized that modern-day descriptions of flying saucers were very similar to accounts of vimanas—ancient "flying

A. May, *Pseudoscience and Science Fiction*, Science and Fiction,
DOI 10.1007/978-3-319-42605-1_7

machines"—in traditional Hindu writings such as the *Ramayana* and *Mahabharata*. He concluded that this was no accident:

> Certain other characteristics make the saucer seem to be only an interplanetary, more advanced, model of the ancient vimana.
> [. . .]
> The *Ramayana* and *Mahabharata* are full of accounts of immense prehistoric aircraft of all shapes and sizes—some large, some small, some jet-propelled, others powered by a source beyond our ken. [2]

With regard to this last point, Leslie picked up on a quote from an ancient Indian text stating that "a vimana can be moved by tunes and rhythms" [3]. He interpreted this to mean the vimana was powered by a form of vibratory energy that manifested itself in the form of musical tones.

A decade or so later, these ideas of Leslie's found their way into a science fiction novel by the well-known Fortean author Lionel Fanthorpe. Called *The Negative Ones*, it was published in 1965 under the pseudonym of John E. Muller. The plot has an ancient Indian vimana turning up, UFO-like, in present-day England. Fanthorpe's description clearly shows the influence of Leslie's speculations:

> The humming intensity of the vimana's acceleration grew louder and stronger. The great disc ship flew on into the unknown vastness of the void. [4]

Today, the legendary Indian accounts of vimanas are often cited as key evidence by adherents of the "ancient alien" hypothesis. The same is true of the Biblical account of Ezekiel's vision. Ezekiel was a Hebrew prophet who lived in exile in Babylon in the sixth century BCE. The best known of his visions took the form of an encounter with a heavenly figure on a throne borne by four strange creatures, each of which had four faces and was supported by a "wheel within a wheel". Traditionally this vision has been interpreted in mystical or symbolic terms, but to some people it is an objective description of an extraterrestrial flying machine.

One of the first people to analyse Ezekiel's vision in these terms was Arthur W. Orton, in an article in the March 1961 issue of *Analog Science Fact & Fiction* entitled "The Four-Faced Visitors of Ezekiel". Orton employed a line-by-line analysis of the Biblical text to come up with a specific engineering design (see Fig. 1).

After completing his analysis, Orton summarizes Ezekiel's encounter as follows:

> We have a description of four space-suited and helicopter-equipped men, getting off of, or out of something that landed in a cloud of dust or smoke.

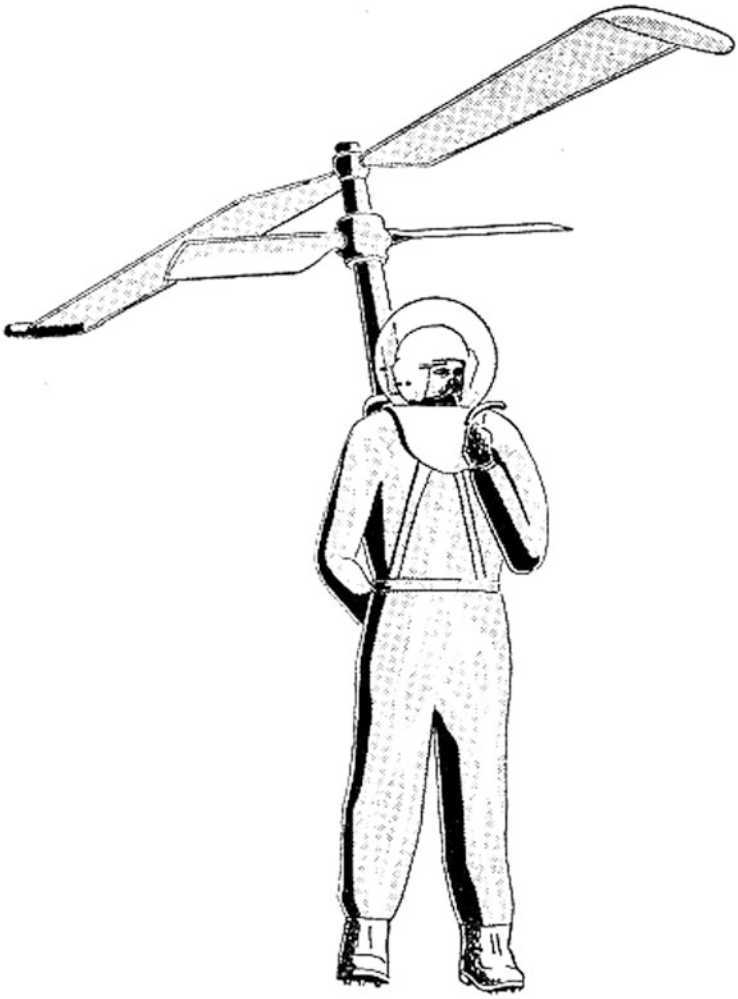

Fig. 1 Illustration from "The Four-Faced Visitors of Ezekiel" from *Analog Science Fact & Fiction*, March 1961 (public domain image)

> The four men start their helicopters, take off and fly to some height. On returning to the ground they remove their flying gear and wait. They are met by a fifth man, riding on a flying platform. [5]

To many people, the notion of "ancient astronauts" is inextricably linked to the name Erich von Däniken. The truth is, however, that it was a well-established idea long before von Däniken wrote his first book on the subject, *Chariots of the Gods*, in 1968. Besides the writings of Desmond Leslie and Arthur Orton already mentioned, the idea was alluded to by veteran science fiction author Eric Frank Russell in his non-fiction book *Great World Mysteries* (1962):

> Anything strange seen soaring above the clouds automatically became a fiery chariot. Some imaginative writers have seized on this fact and turned out stories depicting biblical characters as enlightened visitors from another world. [6]

Pauwels and Bergier's seminal New Age classic *The Morning of the Magicians*, which was discussed in the chapter on "Mind Power", also hints at the ancient astronaut theory:

> In a recent study . . . Professor Agrest, who accepts the hypothesis of the Earth having been visited long ago by interplanetary travellers, relates his discovery among the first texts introduced into the Bible by Jewish priests of references to beings from another world who, like Enoch, disappeared into the heavens in mysterious ark-like vessels. [7]

Pauwels and Bergier's book first appeared in France in 1960. In the same year, the British ufologist Brinsley Le Poer Trench—who later entered the House of Lords as the Earl of Clancarty—published a book called *The Sky People*, which is largely devoted to the ancient alien hypothesis. Even more interesting, the book begins with a short fictional piece by Trench that was published as early as November 1947 in the science fiction magazine *Fantastic Adventures*. Entitled "Son of the Sun" and printed under the magazine's house-name of Alexander Blade, it includes the following passage:

> We are already here, among you. Some of us have always been here, with you, yet apart from you, watching, and occasionally guiding you whenever the opportunity arose. Now, however, our numbers have been increased in preparation for a further step in the development of your planet: a step of which you are not yet aware, although it has been hinted at frequently enough in the parables of your prophets. . . .
> We have been confused with the gods of many world-religions, although we are not gods, but your own fellow creatures, as you will learn directly before many more years have passed. You will find records of our presence in the mysterious symbols of ancient Egypt, where we made ourselves known in order to accomplish certain ends. [8]

Alien Relics

Why is Erich von Däniken so much better known than the various ancient astronaut theorists who preceded him? One possible reason is that his predecessors contented themselves with reinterpreting dusty old texts, while von Däniken went out in search of mysterious relics like a latter-day Indiana Jones. Pseudo-archaeology is far more appealing than pseudo-history. Take the Mayan carving shown in Fig. 2, for example. To modern eyes it does

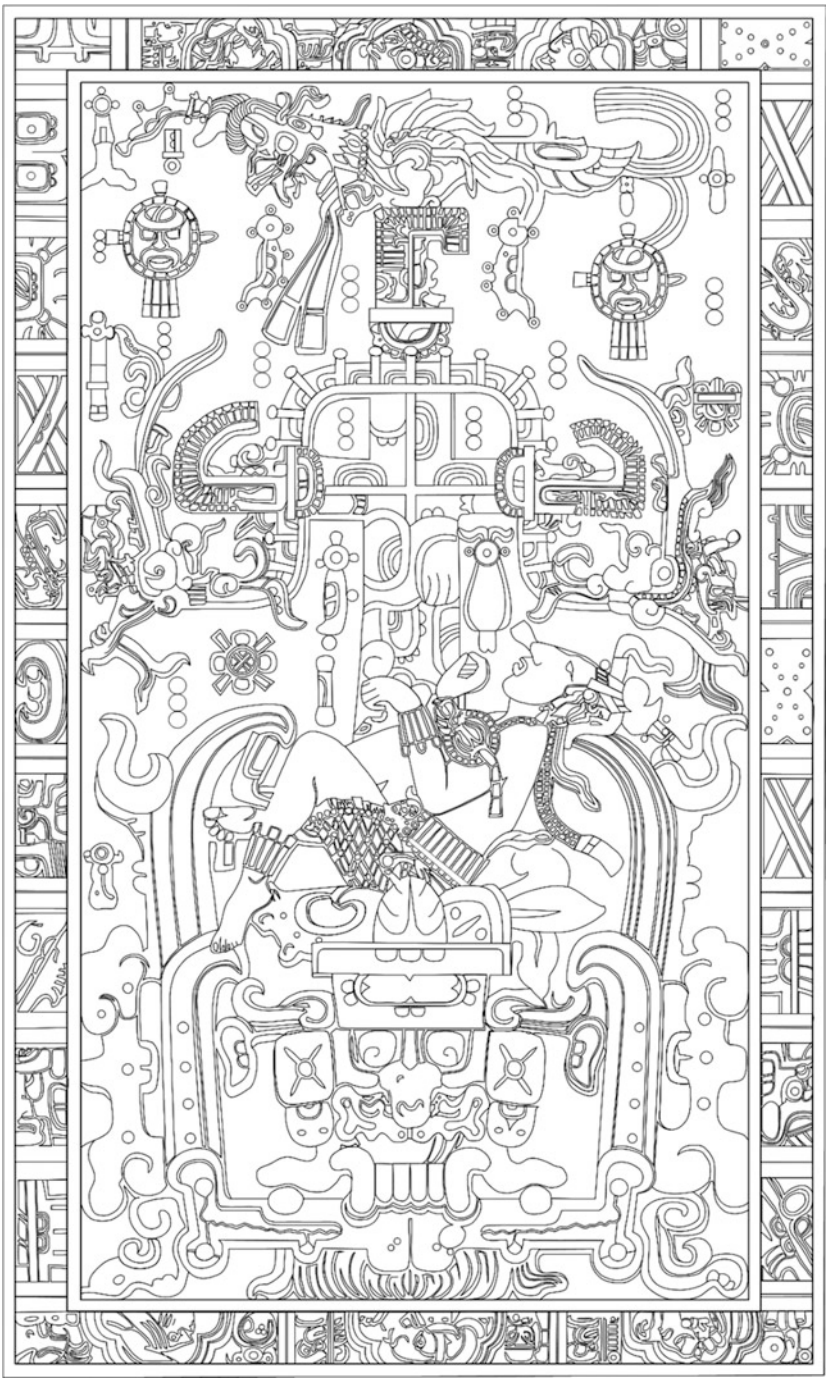

Fig. 2 Tomb carving from Palenque in Mexico, which Erich von Däniken interpreted as the depiction of an ancient astronaut (Wikimedia Commons user: eurhythmia1, CC-BY-SA 3.0)

somewhat resemble an astronaut in a 1960s-style space capsule, and to von Däniken—writing in *Chariots of the Gods* in 1968—that is exactly what it depicts.

The carving is to be found on a stone tomb lid in Palenque, Mexico. Of it, von Däniken writes:

> Could primitive imagination have produced anything so remarkably similar to a modern astronaut in his rocket? Those strange markings at the foot of the drawing can only be an indication of the flames and gases coming from the propulsion unit. [9]

In a rebuttal to von Däniken's theories entitled *The Space-Gods Revealed*, Ronald Story points out that the tomb in question belongs to a well-documented king named Pacal, who lived from 603 to 683 CE. He suggests the carving is a stylized depiction of the king himself, which should be interpreted in the context of other Mayan artwork of the period rather than modern-day culture. On top of that, von Däniken's interpretation does not stand up to close scrutiny:

> The "spacecraft" is rather small, with few outer protections for the rider. Of greater concern is the fact that the astronaut has his head protruding outside the rocket. It is also strange that the figure is barefoot and does not wear gloves (both fingernails and toenails are illustrated) and has a complicated helmet which does not cover his face. Except for a breechcloth and typical Mayan jade anklets, bracelets and necklace, and the helmet on his head, our astronaut is naked. [10]

In spite of objections such as this, von Däniken's theories remain popular to this day. To some extent, this is a reflection of the "extraterrestrial" world-view that has been ingrained on modern culture both by ufology and science fiction. This homage, if that is what it can be called, is not always appreciated. As SF critic Peter Nicholls put it:

> Most science fiction writers regard the adoption of their notions by such people as von Däniken as a travesty which is deleterious to the reputation of their art. [11]

In fact, the "archaeological evidence" put forward by von Däniken and his followers would make far from convincing science fiction. The artifacts they draw attention to are often primitively made and ambiguous as to interpretation. Two oft-cited examples are the Saqqara glider from Egypt and the Baghdad battery from Iraq, both dating from around two millennia ago

[12]. However, the former is made of wood and the size of a small bird; at best it is a scale model of a very simple, unpowered flying machine. The latter, if it really is a battery (which it may not be) would, as Ronald Story pointed out, "be the most primitive form of simple cell possible" [13]—hardly the product of an advanced alien technology.

When alien artifacts are dug up in science fiction they tend to be far more impressive. The Hammer film *Quatermass and the Pit* begins with the unearthing of a Martian spacecraft, buried beneath London for five million years in the same archaeological stratum as fossil ape-men. The film was released in 1967, the year before Erich von Däniken's *Chariots of the Gods*, but an earlier version had been serialized on British television in the previous decade [14].

Somewhat reminiscent of *Quatermass and the Pit* is Lionel Fanthorpe's novel *Space No Barrier*, published in 1964 under the pseudonym Pel Torro. This likewise begins with the unearthing of a long-buried spaceship, this time at an archaeological dig in Iraq. This one comes from much further away than Mars, though, and its robot occupant is still functional. When the archaeologists begin to question the robot, Porshak, they discover just how long he and his spaceship have been buried:

> Porshak's people from empire.
> What kind of empire?
> Galactic empire, of course. You do not know of galactic empire?
> "It has probably disintegrated. There has been no knowledge of it during the recorded history of my people," said Julian Conrad. . . .
> No empire? That is unbelievable.
> [. . .]
> "As I understand it," said Conrad, trying to sum up the situation, "you and your people were involved in some kind of war with another race, the inhabitants of the great city which is now submerged."
> "It was called Atlantis by the natives," replied Porshak. [15]

"Atlantis" is a powerful buzzword in science fiction, immediately conjuring up something that is at once very ancient and highly civilized. Among the works that have already been mentioned in this book, it crops up in such disparate places as Jane Gallion's "Beneath the Bermuda Triangle" (see "Anomalous Phenomena"), the paranoid Shaver Mystery stories ("High-Tech Paranoia"), Robert E. Howard's tales of the warrior-king Kull (also "High-Tech Paranoia") and the back-story to E. E. Smith's space opera *Triplanetary* ("Mind Power"). One of the first great novels of science fiction,

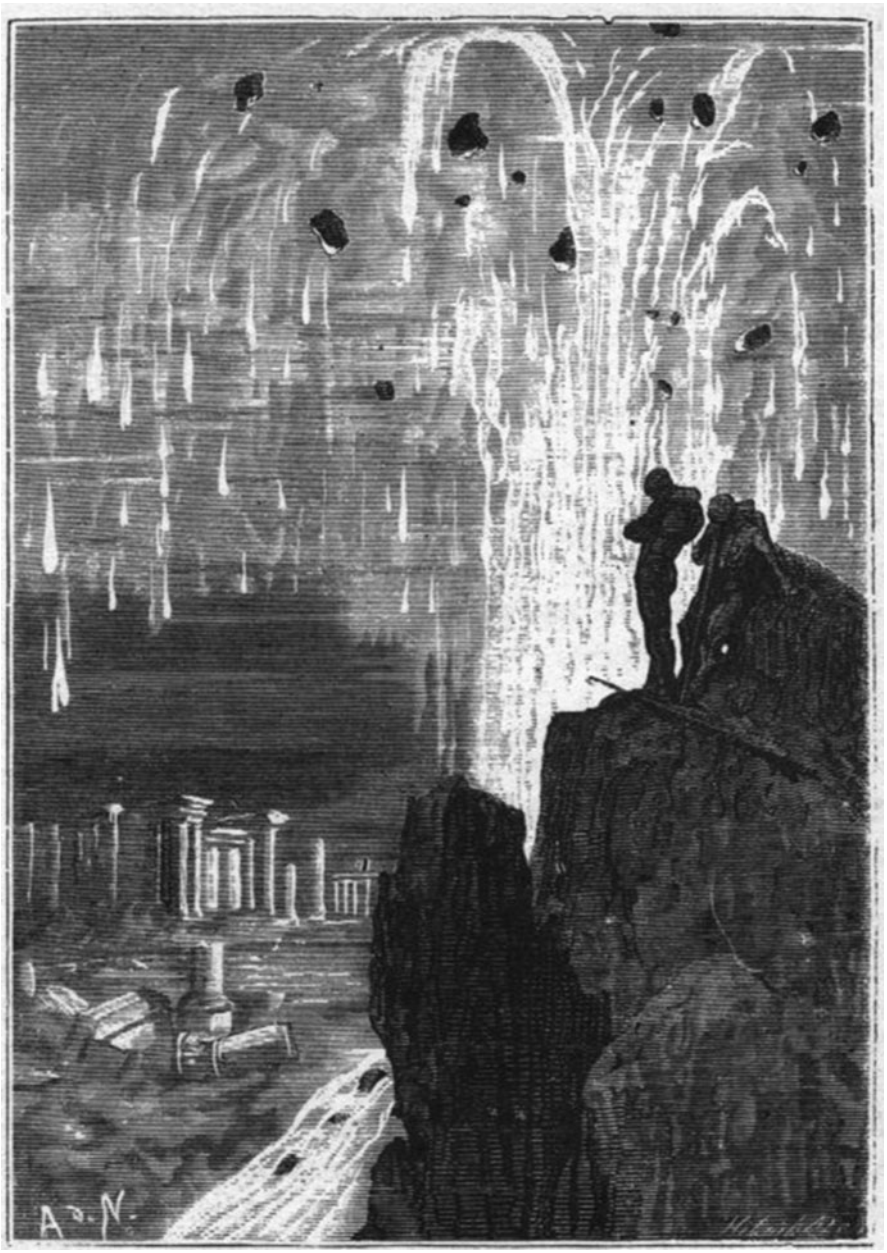

Fig. 3 A visit to the ruins of Atlantis, from Jules Verne's *Twenty Thousand Leagues Under the Sea* (public domain image)

Jules Verne's *Twenty Thousand Leagues Under the Sea* (1870), includes a brief tour of the ruins of Atlantis (see Fig. 3), while one of Marvel Comics' earliest superheroes, the Sub-Mariner (who first appeared in 1939), is himself an Atlantean.

Outside fiction, very little is known about Atlantis. The only really solid fact is that the Greek philosopher Plato wrote a detailed account of its cultural achievements and eventual destruction by flooding. No-one knows whether this was a parable he made up, or his retelling of a story he heard from someone else—and in the latter case, if there is any historical substance to the tale [16]. As a consequence, almost every "non-fiction" book on the subject of Atlantis—and there are many of them—is filled to the brim with wild speculation. As John Sladek wrote in his anti-pseudoscience polemic *The New Apocrypha*:

> Its appeal to cranks . . . has led to the publication of thousands of Atlantean books, moving further and further from any consideration of facts, books like Joseph B. Leslie's *Submerged Atlantis Restored* . . . composed entirely of evidence from spirit mediums. The noted mystic Edgar Cayce similarly obtained his information about the sunken continent from the aether. [17]

The heyday of Atlantean writing was the late 19th and early 20th century, when fiction and non-fiction often became indistinguishable from each other. One book that could be placed in either category was *A Dweller on Two Planets*, published in 1894 under the pseudonym of "Phylos the Tibetan". The narrator tells how his spirit body travelled first to Venus, and then back to a previous life in Atlantis. In the words of science fiction author L. Sprague de Camp:

> He thus learned that when he was Zailm Numinos of Atlantis he had risen by hard work and good luck from a poor miner's son to prince of the realm, and had done very well until he got involved with two women at once. . . . The land prospered under an elective monarchy, the Rai or emperor being chosen by an aristocracy of priests and scientists. The Atlanteans were of course very scientific, having aircraft and television. [18]

Arguably the most notorious person to write "non-fiction" about Atlantis was Madame Blavatsky, one of the founders of the Theosophical movement. To quote Gary Lachman, a historian of popular culture:

> Madame Blavatsky's knowledge of the sunken kingdom came from what she called the Akashic record, a kind of subtle film on which the entire history of the cosmos is written and which she claimed the ability to read. Another theosophist to follow her, W. Scott-Elliot, believed that he too could read the Akashic record, and produced his own Atlantean account, *The Story of Atlantis*, to prove it. He claimed that . . . Atlantis had been destroyed by black magic. . . .

> In 1900 C. J. Cutcliffe Hyne published an Atlantis novel, *The Lost Continent* . . . black magic once again brings the civilization crashing down. In 1904 Rudolf Steiner joined the readers of the Akashic. . . . Once again corrupted by greed and hubris, the Atlanteans destroyed themselves by attempting to control the natural order through technology. [19]

The Ark of the Covenant

Of all the sacred objects mentioned in the Bible, the Ark of the Covenant is probably the best-known—in large part due to Steven Spielberg's 1981 film *Raiders of the Lost Ark*. Described by Indiana Jones in that movie as "the chest the Hebrews used to carry around the Ten Commandments" [20], its physical appearance is specified in considerable detail in the Book of Exodus (see Fig. 4).

In physical appearance, the Ark is not too different from similar chests used by the ancient Egyptians to house sacred relics [21]. However, the Israelite Ark was reputed to contain a uniquely awesome power. As one of the characters says in the movie: "The Bible speaks of the Ark levelling mountains and laying waste to entire regions. An army which carries the Ark before it is invincible" [20]. While the Bible might not actually say this in so many words, it does portray the Ark as "smiting" any unbeliever who dares to open its lid [22].

Fig. 4 The Bible gives a very precise description of the Ark of the Covenant, seen here in a painting by Jacques Joseph Tissot (public domain image)

How did it do this? Later Hebrew commentaries suggest that the Ark contained some form of supernatural energy, causing Fortean researchers Lionel and Patricia Fanthorpe to speculate as follows:

> A luminous cloud known as the Shechinah was seen to hover above, and was clearly distinguished from the familiar smoke created by incense. The word Shechinah comes from an old root meaning to rest, to settle or to dwell. It is not found in the Bible itself. It was widely used, however, by later Jews, and borrowed from them by Christians. It signified the visible majesty of the divine presence.
> [. . .]
> Whether it was the work of Egyptian craftsmen, Israelite craftsmen, survivors of Atlantis or extraterrestrial aliens, the Ark of the Covenant was described as thickly covered with gold. Apart from its commercial and artistic value . . . it also acts as an effective radiation shield. If there was an artifact inside the Ark—some sort of weapon, perhaps—was it nuclear-powered? Could the Shechinah have been a glow of pure energy, visible only when the machine was operating? [21]

Obviously this is all just fanciful speculation, but it does accord quite well with the quasi-apocalyptic climax of Spielberg's movie. Earlier in the film, however, the villain offers his own completely different theory as to the nature of the Ark. He tells Indiana Jones: "It's a transmitter, a radio for speaking to God" [20].

This idea comes straight out of *Chariots of the Gods*, where Erich von Däniken suggests the Ark is "perhaps even a kind of set for communication between Moses and the spaceship". He goes on to say:

> I seem to remember that the Ark was often surrounded by flashing sparks and that Moses made use of this transmitter whenever he needed help and advice. [23]

Immediately before von Däniken makes the suggestion that the Ark is a radio transmitter, he puts forward another, completely different, theory—that the Ark is an "electrical condenser". This is a much less ambitious proposition. A condenser is essentially just a very large capacitor, and a radio would have to contain dozens of capacitors as well as many other components. A capacitor on its own—even a very large one—would have no particular function other than to give someone a nasty electric shock. Yet reading the Biblical accounts, maybe that is exactly what it did do.

An electrical capacitor—even if that is what the Ark of the Covenant was—is very basic technology, and could easily be stumbled upon by an earthbound

inventor without the need for alien intervention. Shorn of the extraterrestrial dimension, there is nothing original about von Däniken's suggestion, as Ronald Story pointed out:

> Von Däniken was not the first to suggest that the Ark of the Covenant was an electric condenser. The idea was presented by Robert Charroux in his *One Hundred Thousand Years of Man's Unknown History* (1963), and he in turn attributes it to Maurice Denis-Papin, author of *Cours Elémentaire d'Électricité Générale*, published in 1948. [13]

In fact, it seems likely that the idea of the "Ark as condenser" was common currency throughout the 20th century. In an article from 1915 entitled "The Wonder World to Be Created by Electricity", none other than Nikola Tesla himself wrote the following:

> Moses was undoubtedly a practical and skilful electrician far in advance of his time. The Bible describes precisely and minutely arrangements constituting a machine in which electricity was generated by friction of air against silk curtains and stored in a box constructed like a condenser. [24]

It seems almost certain that Tesla is referring here to the Ark of the Covenant, thus pre-empting von Däniken by more than half a century.

An unusual twist on the condenser theory can be found in the October 1946 issue of the bizarrely named *Quarterly Review of the Institute for Experimental Metaphysics*. This was a "psychical research" publication, and the paper in question, by one Captain Q.C.A. Craufurd, was entitled "Experiments with a Psychic Condenser". Noting that psychic powers have a tendency to be spasmodic, Craufurd speculated that "the analogy of wireless practices seemed to suggest that some sort of smoothing condenser was required". It then occurred to him that the Ark described in the Bible might be exactly such an instrument:

> It had struck me that the Ark by which Moses was said to have communicated with Jehovah as the Angel of the Lord might have been some kind of psychic device which actually increased the psychic sensitivity of the medium and his circle of priests who made use of it. [25]

In effect, this is a return to the idea of the Ark as "a radio for speaking to God"—except that it is now a "metaphysical" device instead of a physical one!

Extraterrestrial Archaeology

The 1994 film *Stargate* begins with the discovery of a strange artifact in the Egyptian desert. At first sight, the object is unusual but not obviously alien, having the form of a large stone ring adorned with hieroglyphs and other symbols. Only much later is it found to be a highly advanced piece of technology—the portal to an interplanetary wormhole of the type described in the previous chapter. It turns out the "stargate" was placed on Earth in ancient Egyptian times, by a humanoid extraterrestrial who was worshipped as the sun-god Ra.

In many ways, the scenario portrayed in *Stargate* echoes that of "Pyramids of Mars", a 1975 episode of the TV series *Dr Who*. Here the ancient alien took the form of the god Sutekh, rather than Ra, while the entrance to the "wormhole" is located inside an Egyptian sarcophagus. The latter leads not to a planet in another Solar System, as in *Stargate*, but to a pyramid-like structure on Mars, where Sutekh was imprisoned by his fellow aliens [26].

A year after "Pyramids of Mars" was broadcast, NASA's spacecraft Viking 1 entered orbit around Mars and began collecting the first high-resolution images of the planet's surface. By coincidence, some of the images from a region called Cydonia did indeed show pyramid-like structures, as well as other objects which—to a casual observer—look as if they might be artificial. The official view is that these are all examples of pareidolia—a well-known psychological effect which causes the brain to see familiar objects in random patterns. Not surprisingly, pseudoscientists and conspiracy theorists remain unconvinced by this explanation. As Fortean writer Mark Pilkington put it:

> Through some fantastical over-interpretation by zealous mytho-archaeologists, the Cydonian structures were soon being connected to human sacred sites at Avebury, the stone circle . . . and the Pyramids and Sphinx at Giza, in Egypt. [27]

The most striking of the Cydonia features has been dubbed the "Face on Mars"—a rocky outcrop 500 metres high and 1500 metres long that has the appearance of a stylized humanoid face [28]. More recent imagery is far less impressive than the original Viking photos (see Fig. 5), and an article on NASA's own website concludes that:

> What the picture actually shows is the Martian equivalent of a butte or mesa—landforms common around the American West. . . . Cydonia is littered with mesas like the Face, but the others don't look like human heads and they've attracted little popular attention. [29]

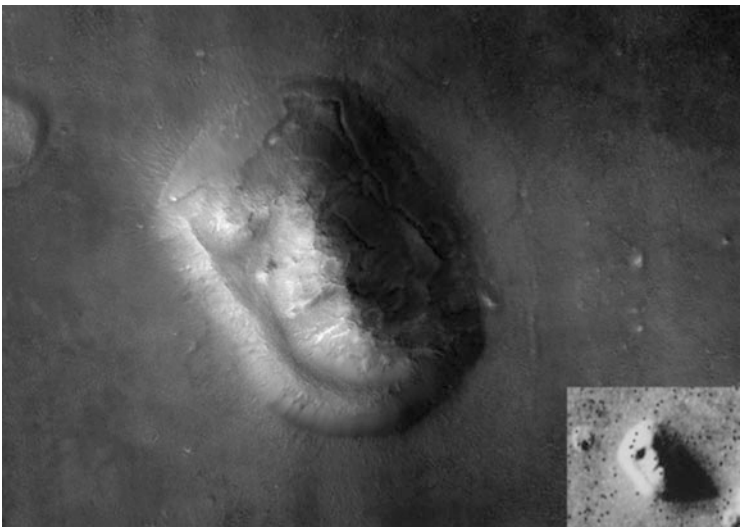

Fig. 5 A high resolution photograph of the "Face on Mars", showing it to be a natural rock formation, with the original—and far more anthropomorphic-looking—Viking image in the *inset* (public domain image)

Inevitably, some people are still not convinced of the Martian face's non-existence. The same NASA article also comments that:

> Some people think the face is *bona fide* evidence of life on Mars—evidence that NASA would rather hide, say conspiracy theorists. Meanwhile, defenders of the NASA budget wish there *was* an ancient civilization on Mars. [29]

Long before Viking 1 photographed "The Face on Mars", a story with exactly that title appeared in an American comic-book. The comic in question was the second issue of a short-lived series from Harvey Comics called *Race for the Moon*. Cover-dated September 1958, the comic is now in the public domain and can be read online [30].

"The Face on Mars" is the last story in the issue. Just five pages long, it was written and drawn by Jack Kirby, who was to become world-famous a few years later as the co-creator of characters such as the Fantastic Four, the X-Men and the Mighty Thor for Marvel comics. For the most part, however, "The Face on Mars" is a run-of-the-mill space fantasy story—its one memorable feature being the eponymous Martian face appearing on its splash page (see Fig. 6).

The caption at the start of the story reads:

Fig. 6 Jack Kirby's "The Face on Mars" appeared in issue 2 of *Race for the Moon*, cover-dated September 1958 (public domain image)

> Report from Moon to Mars Expedition 1: Upon reaching Red Planet, made discovery of startling nature . . . Initial study of object now underway; have measured its dimensions; analysed its substance; present objective is to find out the secret of the Face on Mars. [30]

On entering the "face" through one of the eye sockets, the hero is treated to "a visual history of a race's heroic death—and the triumph of a surviving memory" [30]. Objectively, the only point of contact between Kirby's story and the later Viking image is the phrase "the Face on Mars". The two faces themselves are quite different: the one portrayed by Kirby is much smaller, oriented vertically rather than horizontally, and clearly fabricated from a different material than the surrounding rock.

Nevertheless, people who believe the Face on Mars to be an artificial construct also like to think that Jack Kirby somehow "knew the truth" about it. Conspiracy researcher Nick Redfern says, somewhat inaccurately, that "Kirby's 1958 artistic rendition of the Face on Mars is practically, and eerily, identical to the one that would supposedly not be found by NASA scientists for almost another two decades". He goes on to quote Richard Hoagland, one of the foremost proponents of Martian pseudo-archaeology, as saying "How did Jack Kirby know about the Face?" [31]

As mentioned in the chapter on "Mind Power", some people have wondered whether the X-Men, co-created by Stan Lee and Jack Kirby, might have been inspired by a passage in Pauwels and Bergier's New Age classic, *The Morning of the Magicians*. This is not the only instance where Lee and Kirby's 1960s creations seem to echo the speculative fashions of the time. It could be argued, for example, that the Mighty Thor draws on the "god as alien" mythos. As comic-book historian Sean Howe wrote:

> *The Morning of the Magicians*, a million-selling volume of pseudoscience . . . kicked off a 1960s fascination with the idea that aliens had visited our planet and bestowed advanced technology. Given Kirby's later dedication to exploring this idea, it's likely that he was the one most responsible for threading it through Marvel's adventures in the mid and late 1960s. . . . The Fantastic Four discovered an alien warrior race known as the Kree—who'd communed with the Incas in Peru, just like the ancient astronauts in *The Morning of the Magicians*. [32]

When Howe talks about Kirby's "later dedication" to the idea of ancient aliens, he is probably thinking about *The Eternals*—a comic series Kirby created for Marvel in 1976. Subtitled "When Gods Walk the Earth"—and with the words "More fantastic than *Chariots of the Gods*" emblazoned on the cover of the second issue—*The Eternals* made no secret of its pseudoscience heritage. The first issue opens with archaeologists in South America exploring

an ancient underground "chamber of the gods". Before long, those ancient gods—actually extraterrestrial aliens—have returned to Earth. Kirby's personal fascination with the subject is made clear in a short editorial piece he wrote for that first issue:

> What did happen in those remote days of men's early struggle for civilized status? What is the true meaning of the myths which shared a global similarity among diverse peoples? Did beings of an extraterrestrial nature touch down among us and influence our lives to this present day? And the all-important question of the lot—are these beings in some cosmic orbit which will bring them back to us some day? [33]

Cosmic Origins

In 1951 Arthur C. Clarke wrote a short story called "The Sentinel", featuring the discovery of a strange pyramid-shaped machine on the Moon. The first thing its finders do is take it apart, deactivating it in the process. It turns out this is exactly what they were supposed to do. Placed on the airless lunar surface by extraterrestrial visitors in the distant past, the object was designed to detect intelligent life when it eventually emerged on Earth. As Clarke says in the story, "it was a beacon that down the ages has been patiently signalling the fact that no-one has discovered it" [34].

More than a decade and a half after writing "The Sentinel", Arthur C. Clarke collaborated with film director Stanley Kubrick on *2001: A Space Odyssey* (1968). Taking the short story as its starting point, the screen version replaces the pyramid-shaped device of the original with the iconic black monolith of the film. The movie makes another important change, too. Its alien visitors are more than just curious visitors—they are active participants in the Earth's history. The film's opening sequence, set during the Pleistocene period three million years ago, depicts the monolith appearing among a group of primitive proto-humans. Rather than simply observing them, it interacts with them—a "super-teaching machine", in Clarke's own words [35].

The idea that alien visitors helped humanity along the road to intelligence is an appealing one for many people. Like the religious myths of ancient times, it offers reassurance that *homo sapiens* is somehow better or more important than all the other earthly species. Stories detailing the extraterrestrial origins of humanity are perennial favourites in science fiction. They are sometimes referred to as "shaggy god stories", to highlight the fact that they are simultaneously appealing and far-fetched [11].

Ridley Scott's 2012 movie *Prometheus* provides an interesting twist on the "shaggy god" theme. Based on ancient carvings found at various locations around the world, a team of archaeologists deduce the existence of a race of "Engineers" who were originally responsible for creating *homo sapiens*. Furthermore, they find clues as to the presumed headquarters of the Engineers in a distant star system. A spaceship is duly dispatched there, but when it arrives the crew finds nothing but cryptic remnants of the Engineers. One thing is eminently clear though: at some point the Engineers realized they had made a mistake, and their only desire now is to destroy humanity [36].

The idea that *homo sapiens* has an ultimately cosmic origin is not confined to science fiction. It was the central theme of Brinsley Le Poer Trench's non-fiction book *The Sky People*—although that, as mentioned earlier in this chapter, had its seed in a short fictional piece by the same author. A similar idea crops up, in somewhat confused form, in the writings of Erich von Däniken. The sceptical author Ronald Story summarised the situation as follows:

> Mankind is the creation of the astronaut-gods. In *Chariots of the Gods* von Däniken was satisfied with the thesis that there was deliberate "breeding" by giants who were "sons of God" or escapees from Mars. This took place by sexual intercourse or by artificial fertilization, depending on which passage you read. By the time he got around to *Gods from Outer Space*, he had discovered DNA and the genetic code and claimed that the breeding took place by "artificial mutation of primitive man's genetic code by unknown intelligences". [37]

This idea was subsequently built on by another ancient astronaut theorist, Zecharia Sitchin, in his book *The 12th Planet* (1976) and its sequels. In contrast to von Däniken's scattergun approach, Sitchin's scenario is much more specific—and much more complicated. The Fortean writer Mark Pilkington attempted to summarize it as follows:

> Facing extinction on their home planet of Nibiru 450,000 years ago, the deposed ruler of a race known to mythology as the Anunnaki, the Elohim or the Nephilim travels to Earth . . . with the help of a slave race—us humans—genetically modified from apes about 300,000 years ago. About 100,000 years ago the Anunnaki started interbreeding with humans—as related in the Bible—leading to schisms within the various Anunnaki dynasties, who between them founded all our ancient civilizations. [38]

One of the striking things about the theories of people like Sitchin and von Däniken is the way that—like traditional religions—they cast humanity in the image of the gods. Picking up on this, an article published in *Fortean Times* in

2013 under the pseudonym "The Hierophant's Apprentice" made the following point:

> A layer below this kind of presumption is the idea that aliens are peculiarly interested in human goings-on—humanity, in other words, is cosmically significant. This is also a theme implicit in the proposition that aliens built the pyramids . . . etc. Selfhood—individual, communal or global—thus lies at the centre of the universe. Naturally this is comforting to certain minds. It can reasonably be said that the whole ancient-astronaut mythos is a facet of the human tendency to narcissism, but inflated to cosmic proportions. [39]

The same article traces the ancient astronaut concept back to the fiction of H. P. Lovecraft, quoting the following passage from his short story "The Call of Cthulhu" (1926):

> There had been aeons when other things ruled on the earth, and they had great cities. Remains of them . . . were still to be found as Cyclopean stones on islands in the Pacific. . . . They had, indeed, come themselves from the stars. [39]

It is certainly true that Lovecraft's fiction contains what literary scholar S. T. Joshi calls "a wide array of extraterrestrials (deemed "gods" by their human followers)" [40]. However, Joshi goes on to draw an important distinction:

> Whereas most of the religions and mythologies in human history seek to reconcile human beings with the cosmos by depicting a close, benign relationship between man and god, Lovecraft's pseudomythology brutally shows that man is *not* the centre of the universe, that the "gods" care nothing for him, and that the Earth and all its inhabitants are but a momentary incident in the unending cyclical chaos of the universe. [40]

In other words, Lovecraft's view of "ancient aliens" was diametrically opposed to that of non-fiction authors like Brinsley Le Poer Trench, Erich von Däniken and Zecharia Sitchin. His famous creation Cthulhu is a case in point. Although referred to by scholars as a "Great Old One", and worshipped as a god by a small sect, Cthulhu has no interest whatsoever in human affairs. Lovecraft deliberately avoided giving a clear description of Cthulhu's appearance, but artistic impressions suggest something very different from the comforting anthropomorphism of the ancient astronaut theorists (see Fig. 7).

Fig. 7 Artist's conception of Cthulhu, one of H. P. Lovecraft's far from anthropomorphic "Great Old Ones" (Wikimedia Commons user: BenduKiwi, CC-BY-SA 3.0)

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Conspiracy Theories

Abstract There is a close relationship between conspiracy theory and pseudoscience. They are both products of the imagination which are presented as fact, and there is a high degree of overlap between their audiences, particularly on the internet. Like pseudoscience, conspiracy theories enjoy a two-way relationship with science fiction, prime examples being the *Matrix* movies and *The X-Files* TV series. SF is even invoked explicitly in what conspiracy theorists call "predictive programming", whereby the mass media are used to indoctrinate the public to future social or technological changes. In one variation of the well-known theory that the Apollo moon landings were faked in a movie studio, the man behind the camera was none other than Stanley Kubrick, fresh from directing *2001: A Space Odyssey*.

Blue Pill or Red Pill?

Conspiracy theorists have a unique way of looking at the world. In the words of conspiracy researcher Jamie King:

> It is a belief system that asserts that world events are being governed in secret by a group of ultra-powerful puppeteers behind the scenes. While little may be done about this apparent corruption, at least we can enjoy the satisfaction of having worked out what is going on. [1]

One of the defining features of conspiracy theories is that they "make sense". While they are often highly improbable—particularly in the motives and abilities they ascribe to those in power—they are always logical. Conspiracy theorists see sinister patterns in newspaper headlines in the same way that pareidolia, as described in the previous chapter, can lead people to see faces on Martian rocks. Their "us versus them" attitude, and their insistence that there

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is meaning and purpose behind apparently random and unconnected events, can be seen as a modern-day analogue of the religious zealotry of the past.

There is considerable overlap between conspiracy theory and pseudoscience. People who believe in one are also likely to believe in the other. Some of the most tenacious conspiracy theories are pseudoscientific in nature, such as belief in the Philadelphia Experiment (discussed in the chapter on "Anomalous Phenomena" in this book), government involvement in the UFO phenomenon (the chapter on "Flying Saucers") or the existence of officially suppressed "free energy" technologies ("Space Drives and Anti-gravity").

In 1997, Michael Shermer produced a book entitled *Why People Believe Weird Things*, which deals with both pseudoscience and conspiracy theories. His conclusion is that such beliefs arise for a number of reasons, which can be paraphrased as follows [2]:

- They support and confirm a strongly-held world-view
- They are immediately comprehensible
- They avoid the complexities of the "real world"
- They show that everything has a meaning

Conspiracy theorists, like pseudoscientists, are essentially creative individuals. Shermer highlights the fact that both involve a high degree of confabulation, which he defines as "mixing fantasy with reality to such an extent that it is impossible to sort them out" [3].

Conspiracies abound in fiction, of course. Among the works already mentioned are Eric Frank Russell's Fortean novel *Sinister Barrier* (see the chapter on "Charles Fort and the Forteans"), Richard Shaver's paranoid stories about secret underground cities and mind control (see "High-Tech Paranoia"), Whitley Strieber's Roswell-inspired novel *Majestic* (see "Flying Saucers") and Dan Brown's conspiracy thrillers *The Lost Symbol* (see "Mind Power") and *Angels and Demons* (see "Space Drives and Anti-gravity").

Perhaps the most important purveyor of science-fictional conspiracies was Philip K. Dick, as discussed in some detail in the chapter on "High-Tech Paranoia". Of particular note is his 1964 novel *The Penultimate Truth* (1964), in which—in the author's own words—"everything the government tells you is a lie" [4]. Another novel in much the same vein is *The Zap Gun* (1967), which Dick's biographer Lawrence Sutin summarized as follows:

> Government leaders of both the East and the West finally get wise to the notion that you don't need read weapon systems to keep populations subjugated under the yoke of Cold War terror. Seeing is believing, so why not scrap expensive weapons research and just come up with some dazzlingly devastating videos? [5]

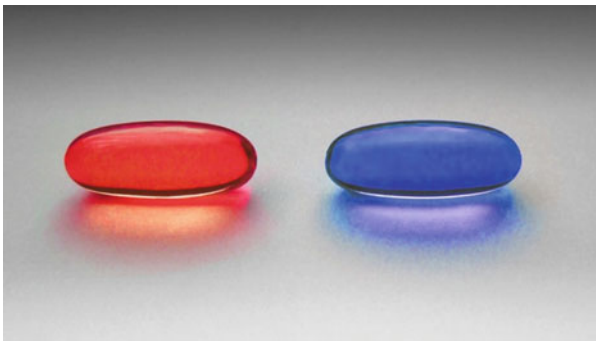

Fig. 1 The *red* and *blue pills* from *The Matrix* symbolize the choice between accepting or rejecting consensual reality (Wikimedia Commons user W. Carter, CC-BY-SA 4.0)

Many of Dick's novels feature characters who discover they are living in a counterfeit version of reality—including a computer-generated one in *A Maze of Death* (1970). A similar situation, involving virtually the whole population of Earth, can be found in the 1999 movie *The Matrix* and its sequels. A particularly memorable element of the film is the symbolism of red and blue pills (see Fig. 1), with the latter representing acceptance of the illusory world and the former escape from it.

As the character Morpheus tells the protagonist, Neo, in the first film:

> This is your last chance. After this, there is no turning back. You take the blue pill—the story ends, you wake up in your bed and believe whatever you want to believe. You take the red pill—you stay in Wonderland and I show you how deep the rabbit-hole goes. [6]

In the wake of the *Matrix* movies, the red and blue pills were seized on by conspiracy theorists as a way to symbolize the choice between their world-view and that of the mainstream. As the website "Know Your Meme" puts it:

> The Red Pill is a metaphorical term used to describe the epiphany of the unpleasant truth of reality in a wide range of contexts. . . . The term has gained widespread usage online among conspiracy theorists and other advocates of minority views in defense of their radical beliefs and proselytism of new adherents. Conversely, the term "blue pill" is used to describe the act of choosing blissful ignorance over the harsh truth. [7]

One of the most prevalent and wide-ranging of current conspiracy theories is the idea of a "New World Order", which author Richard Thomas defines in the following terms:

> The first truly global empire that would include and supplement all the nations of the world and, conspiracy researchers say, be ruled by a tiny oligarchy of enlightened elites who believe that they know what is best for us. [8]

Thomas goes on to point out that just such a "global empire" was advocated in a positive context by one of the most famous of the early science fiction writers, H. G. Wells. His non-fiction book *The New World Order* was written in 1939, more than 40 years after the novels like *War of the Worlds* and *The Time Machine* that first made his name. It might be imagined that Wells used the term "New World Order" in a completely different sense from modern conspiracy theorists, but this is not the case. His vision of obligatory worldwide disarmament, and a "peace" enforced by a global police force, is just what many people—especially in the United States—would consider to be their worst nightmare. Yet Wells tried to put a positive spin on it all, as Richard Thomas explains:

> Wells makes a strong argument for ending the reign of the nation-states and creating in their place a new world state (the New World Order) to unite and rule all the diverse peoples of the globe. A new "world peace" not all that different to the Roman peace of two millennia ago, ending war once and for all by force. Where national sovereignty is a ghost and any nation or person who disturbs the "World Pax" is dealt with "brutally and completely" by a "world police". [8]

H. G. Wells was far from being the only SF author to portray a conspiracy-like situation in a positive light. Several stories show apparently beneficial cases of a small elite controlling the world's affairs. This is easier in fiction than non-fiction, because events can be presented from the point of view of the "string-pullers" themselves.

A good example, already mentioned in the chapter on "Anomalous Phenomena", is H. Beam Piper's series about the Paratime Police. Their role is to conceal the existence of parallel timelines, and prevent interference between one timeline and another. Described by an outsider, this might sound like a typical conspiracy. Piper, however, tells the stories from the perspective of the Paratime Police themselves, so the reader can see that their motives are actually benevolent.

A similar, and much better-known, example can be found in Isaac Asimov's *Foundation* stories. The first of these was published in *Astounding Science Fiction* in 1942 and the last in 1993, the year after Asimov's death. The basic scenario again features a small elite pulling the strings of, in this case,

an entire Galactic Empire. Science fiction critic David Wingrove summarized the situation as follows:

> In the series the Empire is already disintegrating, after the fashion of the Roman Empire, and it descends into a Dark Age which involves the relative isolation of the member worlds. A secret organization, however, is armed with the techniques of "psychohistory" which will enable them to rebuild galactic civilization into a new and better commonwealth of worlds. [9]

Predictive Programming

In February 1601 the Earl of Essex staged an armed rebellion against the Queen of England, Elizabeth I. The rebellion was a complete shambles and ended in failure, but it is memorable for one incident in particular. As historian Lytton Strachey explained:

> Sir Gilly Merrick, one of the most fiery of the Earl's adherents, went across the river with a group of his friends, to the players at Southwark. He was determined, he said, that the people should see that a Sovereign of England could be deposed, and he asked the players to act that afternoon the play of *Richard the Second*. . . . He offered them forty shillings if they would do as he wished; and on those terms the play was acted. [10]

The play in question, by no less a figure than Shakespeare himself, portrays the downfall of King Richard II two centuries earlier. Although Merrick's ruse failed, its purpose was clear enough—to show the public that an unpopular monarch could be removed by force. This is an early example of what conspiracy theorists call "predictive programming".

As described by conspiracy researcher Jamie King, predictive programming is an allegedly well-established practice by which "public media are deliberately seeded with clues about future changes, be they social, political or technological":

> The concept is that, having been exposed to ideas through visual media, when the changes are later introduced, the public will passively accept them rather than offering resistance. [11]

One of the examples given by King is the dystopian movie *The Hunger Games* (2012), depicting a future America in the grip of a totalitarian regime of the "New World Order" variety. The idea, according to the predictive

programming theory, is that after seeing such films the public would be more accepting of such a regime than they might otherwise be.

To anyone but a conspiracy theorist, this argument is likely to sound ridiculous. If the film portrayed a totalitarian society in a positive light, then it might be a different matter, but as it is the audience is left in no doubt that such a future is anything but desirable.

The reality is that dystopian science fiction is almost invariably written as a warning *against* the kind of future it depicts. Even when it is used as propaganda, its purpose is to highlight the virtues of the status quo rather than advocating a nightmarish future. This was particularly noticeable during the Cold War period, when warnings against the horrors of nuclear war abounded in novels, movies and comics (see Fig. 2).

According to the conspiracy theorists, predictive programming is not confined to political regime change. It is also used to explain the "hidden agenda" behind blockbuster sci-fi movies like Steven Spielberg's *Close Encounters of the Third Kind* (discussed in the chapter on "Flying Saucers"). In his book *Science Fiction Secrets*, Nick Redfern speculates on whether such films are "part of a classified operation specifically designed to subtly and carefully prepare the general public for a forthcoming revelation that extraterrestrials really do exist". As with many conspiracy theories, he finds the assertion impossible to prove or disprove:

> When it comes to government agents secretly using science fiction as a convenient mouthpiece to subtly acclimatize the public to the idea that alien beings really are among us, the jury still seems to be very much out. [12]

Back in 1950, at the height of the flying saucer craze, an interesting twist on this idea appeared in a short story called "The Silly Season" by SF writer Cyril Kornbluth. It opens with the world's news media suddenly being inundated with a series of UFO-like sightings. On investigation, however, all the sightings prove ambiguous, and one by one they are dismissed as hoaxes or misidentifications. Eventually it is discovered—only too late—that the sightings were engineered by canny Martian invaders as a deliberate means of wearing down the Earth people's vigilance. At the end of the story, Kornbluth draws an explicit parallel with Aesop's fable about the boy who, when tasked with guarding a flock of sheep, cried wolf once too often. As the story's first-person narrator says:

> The people of the world were the sheep. We newsmen—radio, TV, press and wire services—were the boy... but the cunning wolves had tricked us into sounding the alarm so many times that the villagers were weary. . . . The wolves

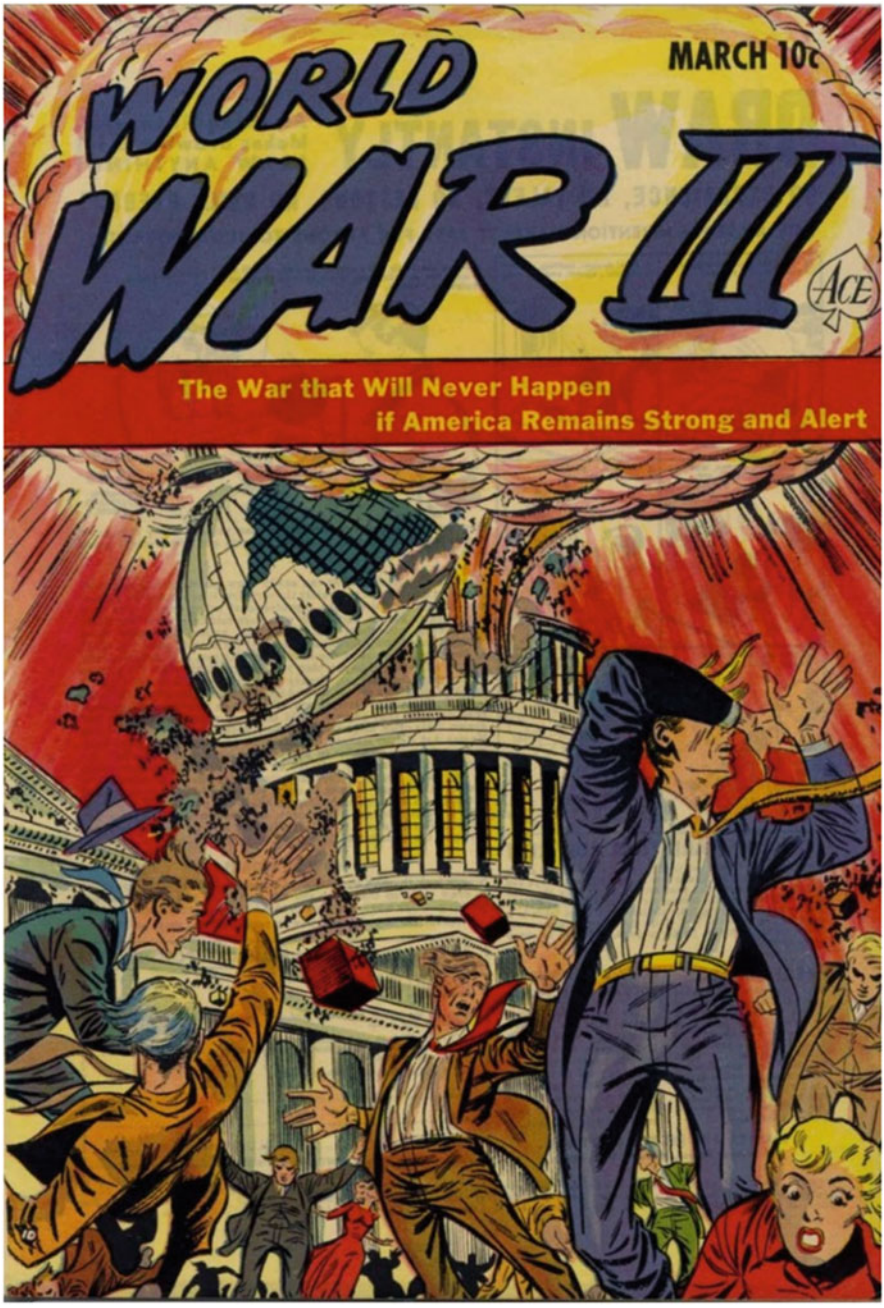

Fig. 2 The March 1952 issue of *World War III*: "The war that will never happen if America remains strong and alert" (public domain image)

> were the Martians under whose yoke and lash we now endure our miserable existences. [13]

Another idea sometimes encountered in pseudoscientific writing is that of "precognitive fiction". One of the earliest speculations on this subject can be found in Pauwels and Bergier's 1960s classic, *The Morning of the Magicians*. The authors suggest that some fiction writers—either consciously or unconsciously—display an "exact knowledge of events that have not yet taken place", and cite the following as an example:

> In 1898 an American science fiction writer, Morgan Robertson, described the shipwreck of a giant ship. This imaginary ship of 70,000 tons was 800 feet long and carried 3,000 passengers. Its engines were equipped with three propellers. One night in April, when on its first voyage, it encountered in the fog an iceberg, and sank. Its name was *The Titan*.
> The *Titanic*, which was wrecked in similar circumstances years later, displaced 66,000 tons, was 828 feet long, carried 3,000 passengers and had three propellers. The catastrophe happened on a night in April. [14]

Certain instances of supposed "precog fiction" are also popular with present-day conspiracy theorists [15]. One example is the *Dr Who* story "Pyramids of Mars", which as described in "Technology of the Ancients" aired a year or so *before* actual pyramids (or, more likely, natural formations resembling pyramids) were discovered on the Red Planet. Even more striking is the case of the pilot episode of a short-lived TV series called *The Lone Gunmen*, first shown in March 2001. The eponymous "Lone Gunmen" were a trio of conspiracy theorists who, having been popular supporting characters on *The X-Files* for many years, were finally awarded a show of their own.

In hindsight, the most striking thing about the pilot episode is the way it foreshadows the destruction of the World Trade Center in New York, just six months after the show aired on American TV. On top of that, rather than following the official narrative of real-world events, the fictional version portrayed the underlying "truth" as being closer to that imagined by 9/11 conspiracy theorists. One of the stars of *The Lone Gunmen*, Bruce Harwood, summarized the pilot episode in the following way:

> The plot was fairly simple: the Lone Gunmen uncover and defeat a government conspiracy to fly a commercial jet plane into one of the towers of the World Trade Center via ground-based computer control of the jet's auto-pilot. The intention was to blame a foreign "terrorist" nation for the bombing, and

> thus encourage the US to enter into a war against it—all to guarantee weapons sales for the US military-industrial complex. [16]

Conspiracy theorists firmly believe that "there is no such thing as a coincidence"—although in reality the only context in which coincidences never happen is fiction. The targeting of the World Trade Center in *The Lone Gunmen* is probably just as much a coincidence as Dr Who's Martian pyramids—although certainly a highly bizarre one.

Fake Space Missions

One of the most notorious conspiracy theories holds that the Apollo Moon landings never actually took place, having been filmed in a movie studio on Earth (see Fig. 3).

Underlying this theory is the idea that, as Lawrence Sutin said in the context of Philip K. Dick's novel *The Zap Gun*, "seeing is believing" [5]. Everything ordinary people know about the Moon landings comes from their TV screens, and who is to say it was not faked? Believers in the conspiracy theory draw attention to what they believe are flaws in this official story—such things as the supposedly lethal quantities of radiation in outer space, and apparent anomalies in the play of light and shadows in the Apollo photographs. All these arguments can be refuted, and many people have done so painstakingly [17]. Unfortunately, the refutations are often harder for the casual reader to understand than the original arguments, so the conspiracy theories will always have their believers.

The first detailed account of the "Moon hoax" theory appeared in 1976, in a non-fiction book by retired aerospace engineer Bill Kaysing entitled *We Never Went to the Moon*. Two years later it was given a huge boost with the release of the movie *Capricorn One*, describing a faked expedition to Mars. Although this was clearly a work of fiction, it led many viewers to deduce that the Moon missions had been similarly faked. As folklore scholar Linda Degh pointed out:

> The mass media catapult these half-truths into a twilight zone where people can make their guesses sound as truths. Mass media have a terrible impact on people who lack guidance. [18]

In October 2002, a French TV channel broadcast a programme entitled *Opération Lune*, which not only claimed that the Apollo 11 footage had been filmed in an earthbound studio, but that this was done under the direction of Stanley Kubrick—the film director responsible for *2001: A Space Odyssey* a

Fig. 3 Some conspiracy theorists believe the Moon landings were faked in a film studio (image copyright *Fortean Times*, reproduced with permission)

year or so earlier. Although the programme was presented in the form of a documentary, it was, as Britain's *UFO Magazine* reported a few months later, "a brilliantly conceived hoax"—and a "blatantly anti-American" one at that [19].

Despite the fact that *Opération Lune* was a simple political spoof, the idea that Stanley Kubrick was the director behind NASA's moon hoax is just too appealing for some conspiracy theorists. Almost ten years after the original documentary, a perfectly serious article appeared on the internet entitled "How Stanley Kubrick faked the Apollo Moon Landings" [20].

More than a decade before the Apollo missions, a fake lunar voyage of a completely different kind featured in Isaac Asimov's short story "Ideas Die Hard" (1957). Here the victims of the "hoax" are the two astronauts themselves. Led to believe they are on a spaceflight to the Moon, things get progressively weirder during the trip—culminating in a view of the wooden props holding up the two-dimensional Moon as they go around the back of it. One of them goes stark raving mad, while the other, recovering in a sanatorium a few weeks later, learns the shocking truth. They never left the Earth at all—they were simply guinea pigs in an experiment designed to investigate the psychological effects of space travel [21].

An even more bizarre space-related conspiracy forms the basis for Eric Frank Russell's novel *Dreadful Sanctuary*, originally serialized in three parts in *Astounding* magazine in 1948. As the action starts, numerous attempts have been made to launch rockets into space, but they have all failed for one reason or another. To make matters worse, progress with the latest rocket keeps hitting little snags—and the nature of those snags provides the first hint of a vast and sinister conspiracy. The male and female protagonists speculate on the subject as follows:

> "I don't know what you think," he concluded, "but to me those hold-ups look somewhat deliberate, as if the rocket is being delayed as much as possible without making the fact too obvious."
> The information gave her subject for thought which occupied her mind quite a while. . . . At length she said: "This poses a curious paradox. The ship is government-sponsored and yet some, though not all, of the snags look government-inspired. The government is trying to build the ship and, at the same time, to delay its completion. . . . Why should the powers-that-be try to build the vessel, but not too soon?"
> It isn't lack of money for one thing. Ask me an easier one!
> We've got to ask it. There's logic somewhere in this seeming illogicality. [22]

That logic becomes clearer as the novel progresses. The protagonists discover the government has been infiltrated by the self-styled "Norman Club"—a small but powerful secret society with an agenda of its own. Its members believe they have discovered a dangerous truth about the extraterrestrial origins of *homo sapiens*, and this is the reason they are determined to sabotage any attempt to get into space. To the protagonists, the members of the Norman Club appear to be insane, yet the club members themselves maintain they are the only sane people on the planet, while the rest of humanity is in the grip of a mass delusion. As is often the case in the world of conspiracies, it is never quite clear just which side is right and which side is delusional.

Sinister Science

As discussed in "High-Tech Paranoia", paranoid fears about mind control—in the form of sinister "influencing machines" targeted at individuals—can be traced all the way back to the 19th century. Since the 1990s, however, conspiracy theorists have been increasingly worried about more general, untargeted forms of mind control.

In 1995, scaremongering reports appeared in certain sections of the media to the effect that the US Department of Defense was working on "high power electromagnetic generators that interfere with human brain waves" [23]. Rumours persist that low frequency radio waves are used in this way, although nothing has ever been acknowledged officially. In the case of sound waves it is a different matter, and it is known that various types of acoustic instruments have been deployed as a "non-lethal" weapons. One such device is described by Mark Pilkington in his book *Far Out*:

> Known as the Long Range Acoustic Device, the unit directs painful or disturbing sounds towards a target using ultrasonic audio beams, and is said to be capable of disorientating or incapacitating a person at up to 500 metres. [24]

Elsewhere in the same book, Pilkington mentions unconfirmed reports that Extremely Low Frequency (ELF) radio signals can also interfere with human perceptions—either intentionally or as a side effect of their primary purpose. One of the main applications of ELF transmitters is to communicate with submarines, and in this context they are sometimes alleged to cause a mysterious hum—"a low modulated drone that sounds like an idling diesel engine or a distant aircraft"—that has been heard in places like Taos, New Mexico [25].

Speculations about the side-effects of ELF made an appearance in an episode of *The X-Files* during its sixth season in 1998. Called "Drive", the episode is particularly memorable for the spectacle of spontaneously exploding human heads. The cause of this phenomenon is the topic of a phone conversation between FBI agents Dana Scully and Fox Mulder:

> **Scully:** ELF fields have been shown to produce biological effects in human tissue inducing electrical currents, altering chemical reactions.
> **Mulder:** Not to mention that as a potential weapons application it's been referred to as "electrical nerve gas" or may be behind the so-called Taos hum.
> **Scully:** What if some overload, some hum from this system could somehow match the resonant frequency of the human skull? [26]

Mulder and Scully are, of course, the main protagonists of *The X-Files*. The series ran for nine seasons between 1993 and 2002, with a much belated tenth season in 2016. Among other things, the show was responsible for bringing previously obscure ideas of pseudoscience and conspiracy theory to a much wider audience. It also popularized the phrase "I want to believe" (see Fig. 4).

Many of the best-remembered *X-Files* episodes were concerned with UFOs and extraterrestrials, but others dealt with more general conspiracy theories—often heavily laden with pseudoscience. The 1996 episode "Wetwired", for example, from the show's third season, dealt with the time-honoured subject of mind control. In this case the medium was TV itself—a frightening prospect simply because it is so ubiquitous. The magazine *Cinefantastique* summarized the episode as follows:

> When several people with heavy television viewing habits kill friends and loved ones for no explainable reason, Mulder and Scully suspect the influence of a signal coming through the cable wire... an imperceptible signal that causes people's most secret fears to flare up into paranoia and delusions. [27]

A similar situation had already been portrayed in the second season episode "Blood", from 1994. In that case, the victims were triggered to murderous action by subliminal messages appearing on electronic displays. The episode is memorable for containing another form of sinister science, as well. In the words of Bob Rickard in *Fortean Times*: "Unmarked planes are spraying a chemical that enhances fear responses—who is experimenting with the town's population?" [28]

The situation here foreshadows a real-world conspiracy theory—Chemtrails—that did not emerge until the end of the 1990s. This is the idea that, as conspiracy researcher Jamie King put it, "aircraft regularly spray harmful substances over the world's population for malicious purposes"

Fig. 4 Agent Mulder's office from *The X-Files*, with the famous "I want to believe" poster clearly visible on the wall (Alistair McMillan, CC-BY-SA 2.0)

[29]. In fact, chemtrails appear to be nothing more than a misinterpretation of the harmless "contrails", or condensation trails, that form naturally behind aircraft under certain conditions. Nevertheless belief in chemtrails remains widespread, and it has the distinction of being one of the first conspiracy theories to emerge solely as an internet phenomenon [30].

Another episode from the second season of *The X-Files* was "F Emasculata", which saw Mulder and Scully investigating the outbreak of a deadly disease—and uncovering yet more sinister science. In the words of *Cinefantastique*: "They discover the disease has been deliberately introduced by a giant pharmaceutical company as some kind of controlled experiment" [31].

The idea of such experimentation is a staple of conspiracy theory. Sadly, such situations are known to have occurred in the real world. Most notorious of all was the experiment conducted in Tuskegee, Alabama, between 1932 and 1972. Hundreds of African-American men, who were known to be suffering from syphilis, were monitored to document the effects of the disease, without

any attempt being made to provide them with medical treatment. When these facts became public, many people began to wonder if the emergence of hitherto unknown diseases, such as AIDS, was also the result of similar experiments [32].

Another persistent rumour holds that governments sometimes exert their control over the population by introducing a psychoactive drug like LSD into the water supply. While there is no evidence that this has ever been done, or is even feasible, there is no doubt that it was considered by the CIA during the Cold War—not as a way of controlling the American public, but as a weapon to be used against the enemy. To quote from one official document from the period:

> If the concept of contaminating a city's water supply seems, or in actual fact is found to be, far-fetched . . . there is still the possibility of contaminating, say, the water supply of a bomber base or, more easily still, that of a battleship. . . . Our current work contains the strong suggestion that LSD-25 will produce hysteria (unaccountable laughing, anxiety, horror). . . . It requires little imagination to realize what the consequences might be if a battleship's crew were so affected. [33]

Science fiction author Robert Silverberg used the idea of a drug in the water supply as the theme of his novella "How It Was When the Past Went Away" (1969). The story features a large cast of characters, all of whom suddenly start losing their memories. One of them eventually deduces the cause:

> By nightfall, Tim Bryce had managed to assemble enough of the story to understand what had happened, not only to himself and to Lisa, but to the entire city. A drug, or drugs, almost certainly distributed through the municipal water supply, had leached off nearly everyone's memory. [34]

Clinical experimentation on human subjects forms the subject of Thomas M. Disch's novel *Camp Concentration*, written in 1968. Set in a secret US military camp, this sees subjects deliberately being infected with a microorganism that causes a debilitating syphilis-like disease—as well as a huge boost in intelligence. As the camp's doctor explains to the protagonist, after detailing a number of historical cases:

> Now, if the spirochete accomplished nothing more in the brain than this sort of havoc—deliriums and disintegration—Camp Archimedes would not exist. But it has been suggested—and by some very reputable people (though they were not usually in the medical line)—that neuro-syphilis is as often beneficent

> as it is at other times malign, that the geniuses I've mentioned (and many others that I might add) were as much its beneficiaries as its victims. [35]

The specific strain of syphilis used in the novel endows its victims with extraordinary mental abilities—eventually allowing them to turn the tables on their captors. While *Camp Concentration* may strike most people as a straightforward anti-conspiracy novel, one reader detected something far more sinister in it. Disch's fellow SF author Philip K. Dick associated the novel with the "neo-Nazi" conspiracy he believed he had uncovered. As described in "High-Tech Paranoia", Dick claimed members of this conspiracy had tried to get him to place coded information in his novels so that it could be "read by the right people". When Dick wrote to the FBI about his suspicions in 1972, he said:

> The reason why I am contacting you about this now is that it now appears that other science fiction writers may have been so approached by other members of this obviously Anti-American organization and may have yielded to the threats and deceitful statements such as were used on me. . . . I stress the urgency of this because within the last three days I have come across a well-distributed science fiction novel which contains in essence the vital material which this individual confronted with me as the basis for encoding. That novel is *Camp Concentration* by Thomas Disch. [36]

In science fiction, not all sinister science sets out to be sinister. The archetypal example is Frankenstein's monster, which started out as a dispassionate laboratory experiment, and ended up killing its creator. A world-destroying counterpart is the substance "ice-nine" that appears in Kurt Vonnegut's novel *Cat's Cradle* (1963). Ice-nine is a fictitious form of water ice with a much higher melting point, so that it remains solid at normal temperatures. It was originally developed by the military for the perfectly innocuous purpose of solidifying mud, thus allowing troops and vehicles to advance more quickly [37].

By coincidence, a few years after Vonnegut wrote his novel, a real-world equivalent of ice-nine was reported in the form of "polywater". This was a supposedly plastic-like form of water first reported by Russian scientists in 1968, and subsequently reproduced in laboratories in several other countries. Nevertheless, polywater was eventually written off as pseudoscience, consisting of nothing more exotic than normal water contaminated with various impurities [38].

In the novel, however, ice-nine is a truly remarkable substance, which proves to be more stable than ordinary water. This means that any water it

comes into contact with immediately solidifies into ice-nine. Since a large fraction of the human body is made up of water, ice-nine makes a compact and highly lethal weapon. That is just the start of the trouble, though. It is only a matter of time before a sample of ice-nine finds its way into the sea, instantly causing the world's oceans to freeze over. That, needless to say, is the beginning of the end of the world [37].

The End of the World

The idea that the world—or at any rate human civilization—could meet its end through the impact of a stray asteroid is familiar from numerous sci-fi disaster movies like *Armageddon* (1998). Yet such impact events really do occur on geological timescales—the most notorious being the one that killed off the dinosaurs some 65 million years ago (see Fig. 5).

The idea that catastrophic events of this type might play a role in the Earth's history was rejected by mainstream science for a long time. Less than half a century ago, textbooks were still flatly denying the possibility, as the following entry from *The Penguin Dictionary of Geology* (1972) makes clear:

> **Catastrophism.** The hypothesis, now more or less completely discarded, that changes in the Earth occur as a result of isolated giant catastrophes of relatively short duration [39].

Part of the reason scientists were slow to accept the "cosmic impact" theory was its long association with pseudoscience. It was championed in a particularly ludicrous form in the 1950s by Immanuel Velikovsky, who produced a series of books with sensationalist titles like *Worlds in Collision* and *Ages in Chaos*. Velikovsky was a psychologist, not an astrophysicist, and his ideas did not come from scientific reasoning but from textual analysis of the Bible and other ancient writings. As a consequence, the catastrophes he wrote about took place just a few thousand years ago, within the span of recorded history, rather than millions of years ago as present-day geologists believe.

The famously sceptical SF writer John Sladek summarised Velikovsky's theory as follows:

> Between 1500 and 700 BC, the Earth was visited by a series of comet-induced catastrophes, which Velikovsky has choreographed thus: Jupiter collides with Saturn, knocking a piece out of itself which becomes a comet. The comet collides with the Earth several times (causing earthquakes, floods, meteor showers, etc). It then collides with Mars, knocking it out of orbit. Mars

Fig. 5 Artist's conception of the asteroid impact that led to the extinction of the dinosaurs (public domain image)

> bears down on us (more quakes etc). Finally, Mars and the comet collide again, very near the Earth. Small comets are pulled off the comet's tail; they become the asteroid belt, while Mars is knocked back into orbit, and the comet settles down to become the planet Venus. [40]

This narrative is utterly at odds with the modern scientific understanding of the way Solar System objects behave. As one astronomer put it, "If Dr

Velikovsky is right, the rest of us are crazy" [41]. In fact, Velikovsky's writings are a perfect example of pseudoscience—which, as described in the introduction to this book, is targeted at the general public rather than the scientific establishment. As such, it follows the laws of supply-and-demand consumerism, not the scientific method. Easy-to-read sensationalism sells—carefully reasoned arguments do not.

Nevertheless, instead of simply ignoring Velikovsky, the scientific community insisted on assailing him with carefully reasoned arguments. These meant nothing to Velikovsky or his readers, and they merely provided additional publicity for his books. As John Sladek put it:

> What ought to have been the unremarkable publication of a crank's speculations became instead a "Velikovsky affair"; his detractors began to make fools of themselves over trying too hard to show him up. [40]

Sladek himself took a different approach. Although he was contemptuous of Velikovsky's claims—as he was of all pseudoscience—he was capable of appreciating them for what they were: an impressive creative achievement. His response was to try the same thing himself. In 1980, he published a short book entitled *Judgement of Jupiter*, under the pen-name of Richard A. Tilms. It used a garbled mixture of astronomical and astrological jargon to predict a forthcoming "age of devastation" [42]. Although presented in the form of non-fiction, the book is clearly intended to be a tongue-in-cheek satire, and is as much a product of Sladek's imagination as any of his science fiction novels.

The pseudo-planet Nibiru was mentioned in the previous chapter, in the context of Zecharia Sitchin's theories about the cosmic origins of humanity. According to Sitchin, Nibiru is on a highly eccentric orbit which causes it to pass close to the Earth every 3,600 years. He believed it was one such close encounter that caused the Great Flood described in the Bible and other ancient writings [43].

At some point, the Nibiru legend became conflated with the idea that the Mayan long-count calendar would come to an end in December 2012. The internet bubbled with speculation that the return of Nibiru, also referred to as "Planet X", would cause a global disaster—in spite of the fact that astronomers insisted no such planet existed. The unwarranted belief spread that the Mayan calendar somehow predicted "the end of the world"—if not through an encounter with Nibiru, then by some other means. Writing in *Fortean Times* in March 2012, the sceptical author Ted Harrison summarised the various speculations as follows:

> Will Earth be struck by a stray comet? Will the mystery Planet X arrive? Perhaps an invisible force of radiation will reach out from the Sun; or will an irresistible galactic energy wave sweep away all in its path? Might there be a destabilizing pole shift? Will God call time on humanity and instigate Judgement Day? [44]

Needless to say, 2012 came and went with none of those things happening. Fortunately for Hollywood, the producers of the blockbuster disaster movie *2012* had sufficient foresight to release it three years earlier, in 2009—thus ensuring healthy box office sales regardless of how history actually unfolded. The film eschews the Nibiru scenario in favour of the "solar radiation" option, which causes a worldwide flood of Biblical proportions. As in the Bible, the disaster is anticipated in advance, allowing a fleet of arks to be constructed to ensure the survival of a select few.

This time around, the "select few" turn out to be the richest and most powerful members of society. This echoes another common conspiracy theory—that the powers that be are plotting to get rid of the great mass of humanity so they can have the world to themselves. A similar idea crops up in the tenth season of *The X-Files*, shown in 2016, where the world-ending disaster takes the form of a virulent epidemic. The outbreak, however, is man-made and premeditated. The people who instigate it are immune to what is described as "the ultimate weapon—the ability to depopulate the planet, to kill everyone but the chosen" [45].

This is just another variation on the "us versus them" theme—the masses pitted against a small elite—which forms the ultimate basis for all conspiracy theories. An even more notorious example is described by Alex Boese in his book *The Museum of Hoaxes*:

> On June 20, 1977, a documentary called *Alternative 3* was broadcast on British television. The show purported to document a vast global conspiracy reaching to the very highest levels of the American and Soviet governments that involved an effort to abduct the Earth's best and brightest citizens and secretly transport them to a colony on Mars. Scientists had learned during the 1950s that the Earth was facing an unavoidable environmental catastrophe that would result in the almost certain extinction of humanity itself. Faced with this inevitability the world's governments had decided to create a "Noah's Ark" colony on Mars. [46]

As the title of Boese's book indicates, *Alternative 3* was nothing more than an elaborate hoax. Technically, in fact, it was not even a hoax but a work of fiction—as anyone reading the end credits would have realized. Inevitably, however, many viewers took the programme at face value, and the company

involved, ITV, was forced to issue a number of statements clarifying the situation. Not everyone was convinced, however—and doubts persisted even into the internet age. "It seems surprising how often *Alternative 3* crops up in Google searches of conspiracy themes", as Steve Marshall wrote in *Fortean Times* on the show's thirtieth anniversary. He went on to say:

> The notion that there must be some underlying and suppressed "truth" behind *Alternative 3* persists even to this day. ITV had first presented the programme as a factual documentary. Their hasty retraction, so soon after the broadcast, was widely seen as proof of some sort of high-level "cover-up" or government interference. To conspiracy theorists, of course, any official denial of their ideas is taken as positive proof that they *must* be true. [47]

For his article, Marshall interviewed the production team responsible for *Alternative 3*, and discovered that they were as surprised as anyone by its enduring popularity among conspiracy believers. To its makers, *Alternative 3* was a work of science fiction, albeit presented in a pseudo-factual way. To its most devoted adherents, it is the exact opposite—hard fact concealed under a veneer of fiction, confirming all their worst nightmares about a super-powerful global elite and its interplanetary technology.

This is just one more example of the thin dividing line between science fiction and pseudoscience, which has been encountered time and again throughout this book. Ultimately the difference may come down to nothing more than the reader's or viewer's perspective. As Steven Spielberg said of *Close Encounters of the Third Kind*:

> If you believe, it's science fact; if you don't believe, it's science fiction. [48]

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