
The *Psi*-ence Fiction of H.G. Wells

By James E. Beichler

Science fiction is about one hundred and fifty years old as a specialized form of literature, although individual scattered stories that could be classified as science fiction date back at least several hundred years. These stories are characterized, or rather differentiated from other types of literature, by the inclusion of scientific material as an essential component of the plot or premise of the story. This characteristic may seem vague, but the breadth and scope of what is considered science fiction is equally vague. Stories can qualify as science fiction by including no more than a single alien character or as much as a completely extraterrestrial setting, technology, science and cast in a far distant future.

Although there is no rule that the science fiction portion of a story must be good science, in general science fiction represents everything from good scientific speculation as derived from the extrapolation of current theories to specific theories that the scientific community has long accepted. Within this context, science fiction will many times reflect the scientific advances and concerns of science during the era in which the stories were written. For the most part, the best science fiction is that which utilizes science most effectively in the tale. The use of good science in a story establishes the credibility of the story and allows believable conditions that are otherwise unavailable in ordinary fictional works. This allows the author to experiment and explore new ideas in his or her story in novel and unexpected ways. The incorporation of real science bestows plausibility to a fictional story that cannot be gained elsewhere while allowing the greatest latitude for the author to explore worlds and societies that would otherwise be implausible.

Although no specific date can be found for the birth of science fiction, the British author Herbert George (H.G.) Wells is considered by many to be the 'father' of science fiction. He is not honored with this title because he was the first science fiction writer; Jules Verne published all of his science fiction novels two decades before Wells began writing, but because he was the first prolific writer of science fiction. His career spanned a half-century, from the 1890's to the 1940's. During this period he developed many of the major themes that characterize more modern science fiction stories, such as time travel. In fact, some scholars have considered him a seer or prophet because he so accurately portrayed the future in some of his stories. He predicted advances in science and technology to a higher degree of accuracy than many scientists themselves. Examples of his more accurate predictions range from air warfare and battle tanks to the use of atomic energy. His science fiction represents some of the best scientific speculation that can be found anywhere while his writings are a testament to the best that science had to offer during his own time. His stories are virtual windows to the science and scientific speculations of his day.

The fact that Wells based many of his stories on the best science available is all the more intriguing in those stories where his science seemed to precede specific scientific discoveries. For example, Wells published *The Time Machine* in 1895. In this story a scientist used a machine to travel in time, or time-space, in much the same way that one travels back and forth in common space. Today we understand this concept because we can extrapolate such a situation from Einstein's special theory of relativity and thus compare Wells' story to the modern view of a space-time continuum. In the context of special relativity, the science presented in *The Time Machine* is plausible, but the story was written a full decade before Einstein first put his theory to the pen. This presents a paradox for students of science and its history. How did Wells know about time-space a full decade before Einstein and Hermann Minkowski originated the concept of space-time?

The clues to a solution of this paradox can be found in Wells' own explanation of his scientific 'theory' of time travel, as expressed by the fictional scientist who developed and built the time machine.

'It is simply this. That Space, as our mathematicians have it, is spoken of as having three dimensions, which one may call Length, Breadth, and Thickness, and is always definable by reference to three planes, each at right angles to the others. But some philosophical people have been asking why THREE dimensions particularly - why not another direction at right angles to the other three? - and have even tried to construct a Four-Dimension geometry. Professor Simon Newcomb was expounding this to the New York Mathematical Society only a month or so ago. You know how on a flat surface, which has only two dimensions, we can represent a figure of a three-dimensional solid, and similarly they think that by models of thee dimensions they could represent one of four-if they could master the perspective of the thing. See?'

Wells' reference to Professor Simon Newcomb indicates the source of his scientific information. Newcomb was not a fictitious character. He was a real scientist who published two major mathematical papers on the characteristics of four-dimensional Riemannian (non-Euclidean) spaces during the 1870's. Over the next thirty years, Newcomb returned to the subject of four-dimensional spaces, but never again with the analytical spirit with which he had earlier explored such spaces. He only popularized non-Euclidean spaces and pointed out the possibility that the physical space in which we exist could be non-Euclidean.

Newcomb had originally been inspired by the work of the English mathematicians W.K. Clifford and J.J. Sylvester. Clifford was the young student of Sylvester, but eventually surpassed Sylvester in his speculations and theorizations of applying non-Euclidean hyperspaces to physics. Sylvester then became a major proponent of Clifford's hyperspatial theories of matter, motion and force. Unable to find adequate employment in Britain, Sylvester departed for the United States in the late 1870's to build the

mathematics program at Johns Hopkins University in Baltimore. At Johns Hopkins, he met, worked with and further influenced Newcomb.

In each of these historical cases, the scientists involved were working with an extra dimension of space. They were not proposing to use time as a fourth dimension of space as did Wells. It takes a tremendous intuitive leap to move from the concept of a fourth dimension of space to assuming time is the fourth dimension of space. Yet this is the major theme of Wells' story. It is interesting and informative to look at Wells' explanation of the science behind his story. He makes it quite clear how time can be utilized as the fourth dimension of space in his development of the plot and by so doing he uses speculative science to establish and make plausible the premise of his tale. The following conversation is a continuation from the above quotation.

'I think so,' murmured the Provincial Mayor; and, knitting his brows, he lapsed into an introspective state, his lips moving as one who repeats mystic words. 'Yes, I think I see it now,' he said after some time, brightening in a quite transitory manner.

'Well, I do not mind telling you I have been at work upon this geometry of Four Dimensions for some time. Some of my results are curious. For instance, here is a portrait of a man at eight years old, another at fifteen, another at seventeen, another at twenty-three, and so on. All these are evidently sections, as it were, Three-Dimensional representations of his Four-Dimensioned being, which is a fixed and unalterable thing.

'Scientific people,' proceeded the Time Traveller, after the pause required for the proper assimilation of this, 'know very well that Time is only a kind of Space. Here is a popular scientific diagram, a weather record. This line I trace with my finger shows the movement of the barometer. Yesterday it was so high, yesterday night it fell, then this morning it rose again, and so gently upward to here. Surely the mercury did not trace this line in any of the dimensions of Space generally recognized? But certainly it traced such a line, and that line, therefore, we must conclude was along the Time-Dimension.'

'But,' said the Medical Man, staring hard at a coal in the fire, 'if Time is really only a fourth dimension of Space, why is it, and why has it always been, regarded as something different? And why cannot we move in Time as we move about in the other dimensions of Space?'

The Time Traveller smiled. 'Are you sure we can move freely in Space? Right and left we can go, backward and forward freely enough, and men always have done so. I admit we move freely in two dimensions. But how about up and down? Gravitation limits us there.'

'Not exactly,' said the Medical Man. 'There are balloons.'

'But before the balloons, save for spasmodic jumping and the inequalities of the surface, man had no freedom of vertical movement.' 'Still they could move a little up and down,' said the Medical Man.

'Easier, far easier down than up.'

'And you cannot move at all in Time, you cannot get away from the present moment.'

'My dear sir, that is just where you are wrong. That is just where the whole world has gone wrong. We are always getting away from the present moment. Our mental existences, which are immaterial and have no dimensions, are passing along the Time-Dimension with a uniform velocity from the cradle to the grave. Just as we should travel DOWN if we began our existence fifty miles above the earth's surface.'

'But the great difficulty is this,' interrupted the Psychologist. 'You CAN move about in all directions of Space, but you cannot move about in Time.'

'That is the germ of my great discovery. But you are wrong to say that we cannot move about in Time. For instance, if I am recalling an incident very vividly I go back to the instant of its occurrence: I become absent-minded, as you say. I jump back for a moment. Of course we have no means of staying back for any length of Time, any more than a savage or an animal has of staying six feet above the ground. But a civilized man is better off than the savage in this respect. He can go up against gravitation in a balloon, and why should he not hope that ultimately he may be able to stop or accelerate his drift along the Time-Dimension, or even turn about and travel the other way?'

While it is clear that the story premise depends on traveling back and forth in time just as we travel back and forth in space, thus making time a dimension of space, there is no indication of where Wells' got the idea for this twist on science. What is not stated is nevertheless still to be found in the archives of history.

As early as 1870, Sylvester had informed a friend that he and other mathematicians regarded time as a fourth dimension of space. By 1885, a short letter to the editor appeared within the pages of *Nature* magazine proposing that time be used as the fourth dimension of space within physical theories. This letter was only signed by "S." so it might seem that the author was anonymous. However, Sylvester signed letters to his friends as "S." and it can be assumed, given his earlier conviction regarding time-space, that Sylvester authored this letter and his friends in the scientific community were aware that he had published the letter. So we see that Wells was once again using legitimate scientific speculation, based on scientific concepts, as the premise for his fictionalized work. Sylvester's opinion on time-space was surely known and debated

within the scientific community and Wells was in a position to know of these debates. Such speculations were not part of the mainstream of science and were not all that popular among the majority of scientists, but scientists and the public knew them during the 1890's.

Wells did not abandon the concept of non-Euclidean hyperspaces after he published *The Time Machine*. He very briefly explored the concept again in *The Invisible Man* of 1897. In this story, another scientist concocted a chemical formula that acted to change his internal index of refraction so that light passed through his body.

"But I went to work -- like a slave. And I had hardly worked and thought about the matter six months before light came through one of the meshes suddenly -- blindingly! I found a general principle of pigments and refraction, -- a formula, a geometrical expression involving four dimensions. Fools, common men, even common mathematicians, do not know anything of what some general expression may mean to the student of molecular physics. In the books -- the books that Tramp has hidden -- there are marvels, miracles! But this was not a method, it was an idea, that might lead to a method by which it would be possible, without changing any other property of matter, -- except, in some instances, colours, -- to lower the refractive index of a substance, solid or liquid, to that of air -- so far as all practical purposes are concerned." (Wells, 1897, 63-64)

It is interesting to note that Wells related the characteristics of light waves to a four-dimensional geometry. This would seem to indicate an unspecified relationship between the fourth dimension and Maxwell's electromagnetic theory. In yet another short novel, *The Wonderful Visit* (1895), Wells briefly related the fourth dimension of space to the physical concept of gravitation. In this example, an angel mysteriously found his way into our three-dimensional space from a four-dimensional space where there was no gravity. In this manner, Wells' semi-scientific model of this fourth dimension differs slightly from the others that he portrayed.

In the following excerpt from *The Wonderful Visit*, the Vicar is discussing dreams with the Angel, when they mutually realize that they may have been in each others domain while dreaming.

They looked at one another.

"And in some incomprehensible manner I have fallen into this world of yours out of my own!" said the Angel, "into the world of my dreams grown real.

" He looked about him. "Into the world of my dreams."

"It is confusing," said the Vicar. "It almost makes one think there may be (ahem) Four Dimensions after all. In which case, of course," he went on

hurriedly - for he loved geometrical speculations and took a certain pride in his knowledge of them - there may be any number of three-dimensional universes packed side by side, and all dimly dreaming of one another. There may be world upon world, universe upon universe. It's perfectly possible. There's nothing so incredible as the absolutely possible. But I wonder how you came to fall out of your world into mine. . . .

"Dear me!" said the Angel; "There's deer and a stag! Just as they draw them on the coats of arms. How grotesque it all seems! Can I really be awake?"

He rubbed his knuckles into his eyes.

The half-dozen of dappled deer came in Indian file obliquely through the trees and halted, watching. "It's no dream - I am really a solid concrete Angel, in Dream Land" said the Angel. He laughed. The Vicar stood surveying him. The Reverend gentleman was pulling his mouth askew after a habit he had, and slowly stroking his chin. He was asking himself whether he too was not in the Land of Dreams.

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Now in the land of the Angels, so the Vicar learnt in the course of many conversations there is neither pain nor trouble nor death, marrying nor giving in marriage, birth nor forgetting. Only at times new things begin. It is a land without hill or dale, a wonderfully level land, glittering with strange buildings, with incessant sunlight or full moon, and with incessant breezes blowing through the Aeolian tracteries of the trees. It is Wonderland, with glittering seas hanging in the sky, across which strange fleets go sailing, none know whither. There the flowers glow in Heaven and the stars shine about one's feet and the breath of life is a delight. The land goes on forever - there is no solar system nor interstellar space such as there is in our universe - and the air goes upward past the sun into the uttermost abyss of their sky. And there is nothing but Beauty there - all the beauty in our art is but feeble rendering of faint glimpses of that wonderful world, and our composers, our original composers, are those who hear, however faintly the dust of melody that drives before its winds. And the Angels, and wonderful monsters of bronze and marble and living fire, go to and fro therein.

It is a land of Law - for whatever is, is under the law - but its laws all, in some strange way, differ from ours. Their geometry is different because their space has a curve in it so that all their planes are cylinders; and their law of Gravitation is not according to the law of inverse squares, and there are four-and-twenty primary colors instead of only three. Most of the fantastic things of our science are commonplaces there, and all our earthly

science would seem to them the maddest dreaming. There are no flowers upon their plants, for instance, but jets of coloured fire. That, of course, will seem mere nonsense to you because you do not understand. Most of what the Angel told the Vicar, indeed the Vicar could not realize, because his own experiences, being only of this world of matter, warred against his understanding. It was too strange to imagine.

What had jolted these twin universes together so that the Angel had fallen suddenly into Sidderford, neither the Angel nor the Vicar could tell. Nor for the matter of that could the author of this story. The author is concerned with the facts of the case, and has neither the desire nor the confidence to explain them. Explanations are the fallacy of a scientific age. And the cardinal fact of the case is this, that out in Siddermorton Park, with the glory of some wonderful world where there is neither sorrow nor sighing, still clinging to him, on the 4th of August 1895, stood an Angel, bright and beautiful, talking to the Vicar of Siddermorton about the plurality of worlds. The author will swear to the Angel, if need be; and there he draws the line. (Wells, 1895, 12-13)

The curious fact of Wells' explanation of existence in a fourth-dimension is that there is no force of gravity, as we know it because "their space has a curve." By stating a reason for the lack of gravity, he has related the phenomenon to a specific theory. Electromagnetism is also affected in a strange manner such that there exist twenty-four primary colors instead of the three in our ordinary three-dimensional space. It is a shame that Wells did not explore the characteristics of the fourth dimension any further. It was not until 1915 that Albert Einstein related the curvature of a four-dimensional space-time continuum to gravity in his own general theory of relativity. Only later were attempts made to develop a 'unified field theory' incorporating both gravity and electromagnetism. Yet it seems that Wells was depicting a unified field theory based upon a non-Euclidean geometry as early as 1895. It was not until 1921 that Theodor Kaluza developed the first five-dimensional theory of the space-time continuum in hope of unifying electromagnetism and gravity.

This depiction of a four-dimensional space raises curious questions for anyone interested in either the history of science or the development of specific theories in physics. Each of these three fictional works seems to anticipate physical theories that were not part of science until Einstein developed his theories of relativity in 1905 and 1915. Wells' concepts of a fourth dimension did not so much anticipate Einstein's later work as it reflected earlier concepts of hyperspace that were popularly known during the 1890's. The roots of Wells' fictionalized science can be found primarily in the work of Clifford who developed a model of electromagnetism based upon a variation of a four-dimensional Riemannian geometry in 1870 and thereafter. Clifford's "Space Theory of Matter" was founded upon the premise that matter was no more than space curved in a higher dimension and 'matter in motion' was no more than variations in that curvature. The primary aim of Clifford's theory was to provide a mathematical model for Maxwell's

electromagnetic theory, but his secondary goal was to reduce all physical forces, such as gravitation, to his four-dimensional model of curved space.

Clifford died a young man in 1879. He was thirty-four years old and his theories were never fully completed. Wells may not have even associated his own ideas of the fourth dimension with Clifford's work nearly two decades later when he wrote his books, even though the original source for his ideas can easily be found in Clifford's earlier theories. The popularization of the basic concepts behind Clifford's research program and the elaboration of his theories by the scientists who carried on his scientific legacy formed the basis for Wells' four-dimensional science fiction stories. Charles Hinton, Frederick W. Frankland, Karl Pearson, Sir Robert Ball, Newcomb and others further elaborated Clifford's concepts. W.W. Rouse Ball also offered a theory of gravity based upon space curvature in 1892. Even if Wells had not directly known of Clifford's theories and concepts, he was still indirectly familiar with Clifford's ideas through the work and publications of these other scientists.

Wells also penned several short stories based upon the four-dimensional hypothesis. They utilize different variations of the same hyperspatial theme. These stories are far more interesting (from the standpoint of hyperspatial science) than his books since Wells employed a hyperspace hypothesis to explain psi phenomena. In this manner, they reflect still other scientists' views of a hyperspatial reality. J.K.F. Zoellner of Germany developed a physical theory of four-dimensional space, which was completely independent of Clifford's work. However, he equated his physical space to the paranormal, psychic and spiritualistic phenomena that were common in the latter 1800's. He was unfortunately duped by the American magician Henry Slade into believing that Slade's magical tricks represented physical evidence of beings in the fourth dimension. When Slade's duplicity was discovered, Zoellner's career was nearly ruined and his theories either discarded or ignored.

Much to the dismay of many scientists and scholars, Zoellner and many spiritualists then found in the fourth dimension a convenient location for spirits of the dead, heaven, angels and God. A great deal of literature was published during the 1880's and 1890's regarding Zoellner's and similar views of a hyperspatial reality. It is from these scientific and non-scientific speculations that Wells based his other science fiction stories. Even *The Wonderful Visit* reflected Zoellner's religious speculations to a small degree through Wells' portrayal of the fourth dimension as a home for angels. Angels ordinarily belong to religious mythology and legend rather than science.

In these other stories, Wells explores the fourth dimension to a far greater extent than the brief expositions offered in his books. In the first example, "[The Plattner Story](#)" (1897), the main character was himself able to travel within the fourth dimension for a period of several days. Plattner, a teacher in a boy's school, was testing a green substance that was found by his students when it exploded, propelling him into the fourth dimension. He found himself in a state of limbo between two worlds, our normal everyday world and a second world inhabited by strange beings. He was still able to view the world of the living, our three-dimensional space, but had lost the ability to

communicate or interact with our common physical world. In this strange new form of reality, Plattner discovered ghost-like beings that seemed to be extensions of conscious corporeal beings rather than the ghosts of deceased humans. This dark mysterious netherworld is an extrapolation of the theories and concepts of Zoellner and the spiritualists. However, Wells still managed to include the scientific aspects of the fourth dimension according to the mathematical models of Newcomb, Frankland and others.

Upon returning to the physical living world of ordinary three-dimensional space, Plattner had become a mirror image of his former self. Physiologically, everything from the right portion of his body had been exchanged for the left and vice versa.

It is to be regretted that Plattner's aversion to the idea of post-mortem dissection may postpone, perhaps forever, the positive proof that his entire body has had its left and right sides transposed. Upon that fact mainly the credibility of his story hangs. There is no way of taking a man and moving him about *in space*, as ordinary people understand space, that will result in our changing his sides. Whatever you do, his right is still his right, his left his left. You can do that with a perfectly thin and flat thing, of course. If you were to cut a figure out of paper, any figure with a right and left side, you could change its sides simply by lifting it up and turning it over. But with a solid it is different. Mathematical theorists tell us that the only way in which the right and left sides of a solid body can be changed is by taking that body clean out of space as we know it; taking it out of ordinary existence, that is, and turning it somewhere outside space. This is a little abstruse, no doubt, but anyone with a slight knowledge of mathematical theory will assure the reader of its truth. To put the thing in technical language, the curious inversion of Plattner's right and left sides is proof that he has moved out of our space into what is called the Fourth Dimension, and that he has returned again to our world. Unless we choose to consider ourselves the victims of an elaborate and motiveless fabrication, we are almost bound to believe that this has occurred.

This is exactly what would happen to a person or physical object that traveled out of our physical space and returned along a path through a higher-dimensional single-elliptic Riemannian space. Newcomb and Frankland had developed a mathematical model of this phenomenon two decades earlier. It is one of the more curious features of Riemannian curved space. So, while incorporating the physical models and speculations of hyperspace from other scientists, Wells still managed to synthesize opposing views of hyperspace to greater explore his fictionalized world.

In another story, "[The Remarkable Case of Davidson's Eyes](#)" (1895), Wells explored the possibility of what would today be called a case of 'remote viewing.' While working in a laboratory filled with electrical equipment and large electromagnets, a scientist spontaneously enters a different world as a result of a fortuitous strike of lightning. The scientist finds himself on the beach of a remote desert island. However, he subsequently discovers that he is still physically present in the laboratory while only

viewing events on the south-seas island. The effect lasts for several extremely disconcerting days. The scientist literally lived in both worlds simultaneously, his sight disconnected from the rest of his existence in his real world of England. Several years after the accident, well beyond the time of his recovery, the scientist is introduced to a naval officer who lived through the real events that he had witnessed. He is then confronted with the realization that what he had seen was not a dream or hallucination, but rather a 'remote' vision of another location in normal reality.

Wells does not offer an explanation or theory of how this could occur until the very end of the story.

That completes the remarkable story of Davidson's eyes. It is perhaps the best authenticated case in existence of a real vision at a distance. Explanation there is none forthcoming, except what Professor Wade has thrown out. But his explanation invokes the Fourth Dimension, and a dissertation on theoretical kinds of space. To talk of there being "a kink in space" seems mere nonsense to me; it may be because I am no mathematician. When I said that nothing would alter the fact that the place is eight thousand miles away, he answered that two points might be a yard away on a sheet of paper and yet be brought together by bending the paper round. The reader may grasp his argument, but I certainly do not. His idea seems to be that Davidson, stooping between the poles of the big electro-magnet, had some extraordinary twist given to his retinal elements through the sudden change in the field of force due to the lightning.

He thinks, as a consequence of this, that it may be possible to live visually in one part of the world, while one lives bodily in another. He has even made some experiments in support of his views; but, so far, he has simply succeeded in blinding a few dogs. I believe that is the net result of his work, though I have not seen him for some weeks. Latterly, I have been so busy with my work in connection with the Saint Pancras installation that I have had little opportunity of calling to see him. But the whole of his theory seems fantastic to me. The facts concerning Davidson stand on an altogether different footing, and I can testify personally to the accuracy of every detail I have given.

The "kink in space" of which he speaks is reminiscent of what might be called an 'Einstein-Podolsky-Rosen bridge' in modern theoretical physics. Once again, the paranormal effect described is strictly electromagnetic in nature. The surge in strength of the electromagnet somehow 'twisted' his eyesight, connecting it to another place in the same reality at the same time. The use of the word 'twist' by Wells is especially interesting, since the 'twist' was the basic element of space curvature in Clifford's theory.

Of all the various types of paranormal phenomena that Wells could have written about, it is strange that Wells picked a case of "real vision at a distance," today's 'remote vision.' The late 1800's were filled with all kinds of spiritualistic and thus paranormal

phenomena. Most of these were associated with the work of mediums and dealt with the semi-religious aspects of life after death, ghosts and spirits. What we would now call 'psi phenomena' such as ESP and PK events were not nearly as popularly regarded by the general public. However, attempts were being made by a few legitimate scientists to study what we now call 'psi phenomena.' Scientists and concerned scholars organized the British Society of Psychical Research in the 1870's to cope with these important phenomena. The research efforts of these scientists evolved into the academic discipline of parapsychology during the present century.

It was not until the 1970's that 'remote viewing' was carefully studied as a type of psi phenomena. ESP and PK events have always dominated parapsychological research. Harold Puthoff, Russell Targ, and Edwin May first conducted important research on 'remote viewing' at Stanford Research Institute in the 1970's. Then, late in 1995, it was announced that the CIA had been secretly conducting research in 'remote viewing' for the previous two decades. The CIA project was code named 'Star Gate.' Government bureaucrats who concluded that no significant results had come from the research wrote a report on 'Star Gate'. Any positive results from the project were thus officially discounted. But the head of the project, Dr. May, concluded that significant results of 'remote viewing' were discovered during the research. At present, there is no theory to explain 'remote viewing' as well as any other psi phenomena. Wells' brief allegation of an explanation derived from the four-dimensional hypothesis is still valid and offers perhaps a better explanation than any that has been offered by modern scientists, even though ignored by science.

It is difficult enough to gauge how scientists regard Wells' work today, let alone how it was regarded during the 1890's and early twentieth century. *The Time Machine* was an immediate success when published and several movies have been made from it over the decades. It has probably influenced the development of science fiction more than any other book or story ever published. *The Invisible Man* has also generated movies and other works of literature, but not to the extent of *The Time Machine*. However, Wells' other tales of the fourth dimension have not fared so well. In any case, the updated movie versions of Wells more popular books have had all of the scientific references to the fourth dimension removed, stripped away. Viewing audiences are not interested in scientific explanations, only in excitement and fast paced action, while producers are only interested in the money that they can earn from the audiences.

One small indication of how Wells' stories have been received by scientists after the turn of the century comes in the form of their inclusion in a bibliography of hyperspace and non-Euclidean publications by D.M.Y. Sommerville. By 1911, this mathematical field of study had become so large and diverse that Sommerville published a book length bibliography of the subject. The topics were extensively indexed, catalogued and cross-referenced, so it is not that difficult for anyone to find Wells' fictional stories of the fourth dimension. They are listed under the general topic "Space of n Dimensions," within the subject heading of "Generalities" and finally under "Fiction." Sommerville considered the subject of fiction important enough to be listed alongside professional mathematical papers on non-Euclidean and hyperspace geometries. In fact,

Sommerville also wrote two very short fictional pieces on the same subject. The sheer size of Sommerville's bibliography emphasizes the importance of the field of non-Euclidean geometries and hyperspaces to mathematics, science, philosophy and culture in general during the Victorian era.

Curiously enough, another short story written by Wells is listed in Sommerville's bibliography. This story was published in 1903, several years after the other stories. It is titled "[The Stolen Body.](#)" It is a story of the possession of one man's body by another entity. This other entity seems to have come from a parallel world. While conducting a personal experiment in "thought projection," Mr. Bessel, a businessman rather than a scientist, accidentally leaves his body only to have his unconscious body inhabited by a malevolent spirit before he can return to it. He is then trapped outside of his body with no way to return, in another world. This other world is coexistent with our physical world, intimately connected yet somehow separate from it. In this other world, malevolent spirits who seek to inhabit human bodies and thus experience "life" pursue him.

Many features of this story are quite interesting in their perspective of the experience of this other world. Today we would call the act of leaving your host body in this manner an OBE, or out-of-body experience, although there is no scientific validation of spirits in the realm where the displaced 'consciousness' travels. There is no physical evidence that OBE's are real, but many people claim to have experienced them so they are recognized as a distinct form of psi phenomena. One important feature of Wells' account of this paranormal phenomenon is his scientific explanation of the event, or perhaps his lack of relating this world of spirits to a fourth dimension of space.

At first Mr. Bessel's mental state was an unemotional wonder. His thought chiefly concerned itself with where he might be. He was out of the body - out of his material body, at any rate - but that was not all. He believes, and I for one believe also, that he was somewhere out of space, as we understand it, altogether. By a strenuous effort of will he had passed out of his body into a world beyond this world, a world undreamt of, yet lying so close to it and so strangely situated with regard to it that at all things on this earth are clearly visible both from without and from within in this other world about us. For a long time, as it seemed to him, this realisation occupied his mind to the exclusion of all other matters, and then he recalled the engagement with Mr. Vincey, to which this astonishing experience was, after all, but a prelude. (Wells, 1895)

Even though Wells does not mention a fourth dimension, Sommerville has assumed that Wells had implied a fourth dimension and so listed this story with Wells' other stories. Wells' description of our physical world of three dimensions as a "sheet of glass" with our images in it when viewed from the other world does bear some resemblance to suggestions by Clifford, Pearson, Sylvester, Hinton, (W.W.R.) Ball and Newcomb that our three-dimensional world is like an undulating sheet or slice of the greater four-dimensional space. The idea that spirits could inhabit this greater four-dimensional space again demonstrates the influence and ideas of Zoellner and the spiritualists.

This would also tend to indicate that Somerville had his own preconceived notions of a four-dimensional reality. After all, as an English scientist the same scientific attitudes and literature that inspired Wells would have influenced him. The important point is that Wells equated this parallel world with an entity that could possess a human body, replacing the consciousness already inhabiting that body. Such a possession is clearly a paranormal phenomenon. Of his several stories regarding psi phenomena and the paranormal, this is also the only story in which a medium is mentioned even though mediumship was the most common form of paranormal activity during the Victorian era. Mediums were an extremely important component of the spiritual movement. The fact that mediums were not better portrayed in Wells' stories may well indicate that he thought mediumship was not as soundly based in science as the other phenomena that he portrayed.

The idea that 'consciousness' or something like it can somehow be separated from the body, but still exist in the fourth dimension of space, seems to be a common theme to Wells' stories, except for *The Time Machine*. Throughout these stories, the fourth dimension is also associated with both electromagnetism and gravity, with far more emphasis on the electromagnetic aspects of the fourth dimension. Although a four-dimensional space does not necessitate a non-Euclidean geometry, Wells' allusions to curves and twists certainly indicate that he was specifically referring to a non-Euclidean hyperspace. This harbors well with attitudes of the period, which equated hyperspace with non-Euclidean geometries. Prior to about 1910, there was a great deal of scientific speculation that our common space of experience was non-Euclidean rather than Euclidean. But there was also a realization that the radius of curvature of our space probably differed from that of Euclidean flat space by far too small an amount to measure, so our world would seem to be Euclidean in nature for all intents and purposes. Wells' stories reflected the scientific speculation that common space was both non-Euclidean and four-dimensional. He explored both the physical and whimsical consequences of such a possibility in his fictional stories.

In this way, his work is similar to the speculations that a scientist might make to decide how a particular physical characteristic affects phenomena and events. The scientist would speculate, but not weave a story around that speculation, as does a science fiction writer. Science does not have as wide a latitude for extrapolation from fact and valid theory as the science fiction writer. A science fiction author can use this latitude to his own advantage, exploring areas of science that a scientist may be hesitant about exploring. Nor does a science fiction writer need to worry about the social implications of the science that he writes about. Instead, he can explore different aspects of the social ramifications of different theories and technological advances. The scientist must deal with the cultural, emotional and human interactions in the real world unlike the science fiction writer. In all of these respects, Wells was a genius. All of his stories have a timelessness and are easily understood within a more modern context.

Conclusion

Wells' fictional stories actually covered the gamut of physical uses of which the fourth dimension was suspected during the Victorian era. The fourth dimension was thought by some to house either ghosts or god and angels, depending upon one's beliefs. By others of more scientific bent, it was thought that the fourth dimension may be time or the universe was a time-space. The most curious of Wells' stories was that of the angel from a fourth dimension where there was no gravity. This notion could have reflected either knowledge of Clifford's work or (W.W. Rouse) Ball's, while Wells' association of hyperspace to electromagnetic phenomena clearly reflects Clifford's influence.

Today, some modern physicists theorize that our universe is a ten-dimensional manifold. This newer hyperspace theory utilizes a Kaluza-Klein model of a five-dimensional space-time continuum. In the Kaluza-Klein model, our four-dimensional space-time continuum is curved in the fifth dimension, but the fifth component to our space-time is so small (and curves back on itself) that the fifth dimension is virtually non-detectable by physical means. Wells, inspired by the work of others, has come close to this view, save some small details. His four-dimensional space does not include time, so his own 'manifold' would represent a four-space with a separate time, for a total of five dimensions. There is obviously a great deal to learn from the perspective presented in Wells' *psi-ence* fiction.

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