Tangents Short Guide

Tangents by Greg Bear

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Overview

The short story form is especially valuable for young adult readers because it offers characters, situations, and ideas that can be absorbed in one sitting. Short stories can introduce the complexities of fiction to busy young people occupied with school studies, extracurricular activities, social lives, and the hard work of growing up. Bear is a master of short fiction, and his speculative stories on science strongly attract young readers.

"Tangents" presents the story of a boy, an outsider with an empty family life, who meets two eccentrics surviving unconventional lives far from their homeland. Pal Tremont, a young Korean adoptee, finds that his musical gifts are complemented by the mathematician Peter Tuthy, a refugee from England, who was persecuted there for being homosexual. Together they open the unseen world of the next dimension beyond the normal one that people experience everyday, and they discover extradimensional beings who have never before noticed humans.

About the Author

Greg Bear was born in San Diego, California on August 20, 1951. He grew up in many different areas of the world because his father was a Navy man who served assignments in Japan and the Philippines, as well as postings to naval bases on the Gulf Coast, East Coast, and West Coast of the mainland United States. His childhood experiences in diverse lands may account for the sensitivity to different cultures displayed in his fiction. It is difficult for young children to make friends when moving about frequently, and Bear's passion for reading may have its origin in lonely hours when he was young. He is an eclectic reader of science, history, and fiction.

His ambition to be a writer seems to have begun early, perhaps when he was eight years old, and Bear was writing in hopes of publication by the time he was a teenager. This precocious feat was achieved at fifteen when he sold a short story to Famous Science Fiction. Despite his early good fortune Bear, like many young writers, found it difficult to publish other works. His second professional publication did not appear until he was in his early twenties, but he then attracted critical attention as one of science fiction's most promising young talents. In the years since he has retained the respect of critics with his taut narratives and imaginative settings.

To supplement his income as a novelist, Bear worked as a journalist, contributing to Southern California newspapers during the 1970s and early 1980s. Bear is widely admired by his science fiction peers, and he has served in various posts for the Science Photo of Greg Bear Fiction Writers of America, including president from 1988 to 1990. The Science Fiction Writers of America have given Bear three Nebula awards: for best 1983 novella, Hardfought; for best 1983 novelette, "Blood Music"; and for best 1986 short story, "Tangents". The World Science Fiction Convention has twice given Bear its annual Hugo award: for best 1984 novelette, "Blood Music" and for best 1987 short story, "Tangents."

Bear even married into the science fiction community in 1983. His second wife Astrid Anderson is the daughter of science fiction author Poul Anderson, and the couple have a son Erik and a daughter Alexandra.

Bear speculates that "Tangents" "gathered more awards, perhaps, because, behind the mathematics, there is an angry parable based on the life of the English mathematician Alan Turing .. . Or perhaps because science fiction readers truly appreciate mathematical fantasies." "Tangents," regardless of the underlying reasons for its popularity, has a youthful protagonist in search of a place for himself and a mind-expanding view of the world that directly appeals to young adult readers.

Setting

The story told in "Tangents" takes place in rural or suburban California, probably in the early 1950s. The local community is largely indifferent to the presence of Korean-born Pal Tremont and unaware of Lauren Davies and Peter Tuthy, who live in a isolated house beside grassy fields. These unfrequented fields offer Pal a place to go to be by himself as he has given up on fitting in with his California community.

Lauren and Peter do not have a happy life. Peter slaves to make a meager living through free-lance research, earning a small fraction of what someone of his ability should be paid.

Lauren—neither a sister nor a lover but such a close friend that she could be Peter's sister—struggles to hold Peter together and maintain their household. Pal is a welcome visitor to the house because he provides Peter with new ideas to become excited about.

This enthusiasm and interest are intellectual since Peter has no sexual longings for children, but the community might see the situation differently, and a client named Irving Hockrum, who has been exploiting Peter, may use Pal's friendship with Peter to torment him.

Social Sensitivity

Bear remarks that "there is an angry parable based on the life of the English mathematician Alan Turing" in "Tangents." Turing created in the 1930s and 1940s what is now called the "Turing machine," a device capable of making any mathematical calculation that became one of the inspirations for digital computers. Turing was a cryptographer during World War II who worked to break the codes of the Axis powers. Part of his work may have contributed to British victories in North Africa by cracking the code the German army was using in the field, thus helping British forces learn about German targets ahead of time.

Turing was interested in artificial intelligence, and his intellectual scope extended to applying mathematics to biology and psychology. His "Turing test" is still used on computers and computer software to determine a machine's ability to think independently of human influence.

Homosexuality in England had been outlawed in the 1890s as part of a large child-protection bill. The law was used to harass Turing, and he was forced by legal authorities to undergo treatments intended to rid him of his sexual orientation. The humiliation became too much for Turing, who committed suicide in 1954 rather than continue his treatments.

Bear adds emotional depth and resonance to his story by basing his Peter Tuthy character on Alan Turing, although he has the fictional Peter flee to the United States in hope of finding refuge from his tormentors, rather than committing suicide. One of the world's foremost experts on applied mathematics, he is reduced to doing uncredited free-lance research for American corporations. He is certainly cruelly exploited in humbling circumstances, though not so unremittingly humiliated as Turing was.

Turing is widely admired today for his work in science and for his efforts during World War II, although mathematicians and engineers still hotly debate whether Turing's work on computer theory is of any lasting value.

His still-used "Turing test" is the subject of an annual report on PBS's Scientific Frontiers series, with engineers trying to build machines that will pass the test and be considered true thinking machines. In the United Kingdom there is a Turing Institute, and there is an annual Turing Award for work in computational research.

This posthumous acclaim pays tribute to his achievements and what has come out of his work, but its does nothing to mitigate the stark facts that Turing was forced to live dishonored and miserable before taking his own life. Bear, perhaps in an excess of sentimentality, gives Tuthy a way out by using mathematical theories about other dimensions to give him a chance to escape to a world that will not persecute him for his sexual orientation—one that may even welcome his ability to think about complex mathematics.

Literary Qualities

Bears pulls together two main ideas in "Tangents," one to give it structure and humanity and the other to give it interest. The structure is provided by the story of Peter Tuthy, an exile from his homeland who has been tormented for his homosexuality. The central conflict of the short story is between Peter and a society which condemns homosexuality. This clash is intensified when it appears his benign relationship with Pal may be used against him by those who are intolerant and vengeful; it is resolved by his escape out of this world altogether. Peter and his relationship with Pal also humanize a story that is focused on the abstraction of the tesseract. It is a fine achievement that Bear manages to construct a story around a difficult mathematical concept, while yet keeping the tale a human one in which the characters matter. Indeed, the lives of the characters give meaning to the tesseract because the dimension of tesseracts becomes home to Pal and Peter.

It is interesting, though somewhat unsettling, that the route for happiness for exiles Pal and Peter is a further, ultimate exile: they abandon our universe for another one. The fate of Lauren Davies, who has lived with Peter for over twenty years, is also unsettling. She lacks the special abilities of Pal and Peter so she can only observe, not participate, as the two friends find their means of escape from society. She characterizes herself as a "spinster," a sign that she thinks of herself as a social outsider, but she may have to be content with knowing that Pal and Peter are happy, even if she now is without companionship.

The central interest and chief active agent of the story is the concept of the tesseract; without it nothing special happens. Rather than a long explanation of what tesseracts are, Bear adroitly uses the tale of his alienated characters to illustrate how tesseracts might work. One of the special appeals science fiction has for all ages is that it takes often difficult scientific ideas and shows how they work, in contrast to merely telling how they work. The slicing up of Peter and Lauren's home is exciting, and makes tesseracts not just abstract concepts but physically dangerous ones.

Themes and Characters

"Tangents" is an idea story built around an analogue theme— in this case the mathematical possibility of a fourth dimension that is to the three dimensional world as the third dimension is to the two dimensional world.

This conceptual framework veers somewhat from Einstein's contention that the fourth dimension is time. The central concept used to develop this theme is the tesseract, likely to be familiar to some readers from Madeleine L'Engle's A Wrinkle in Time (1962; see separate entry, Vol. 4).

Tuthy defines the tesseract for Pal: It's a four-dimensional analogue of a cube. I'm trying to teach myself to see it in my mind's eye," Tuthy said. "Have you ever tried that?

Pal has not tried it, but his extraordinary talent for making music is about to help him do so.

Pal represents a fundamental figure in literature for young adults, one seen in many of the most successful juvenile novels and stories. This is the figure of the adolescent (male or female) who is isolated from his peers, misunderstood by the adults whom he has previously encountered, and estranged from the social settings most likely to appeal to an "average" young person, but who is yet gifted with extraordinary talents—usually hidden from casual sight and often verging on the supernatural—which lead him into a wonderful world where he becomes greatly admired. Such a figure often appeals to young adults because they are frequently disoriented, if not lost, wanderers in the transitional borderland of confusion and fear between childhood and adulthood. This is where they lose the normal childhood certainty of being permanently cherished at the shielded center of the world of the adults around them, only to discover that they must compete for attention with a host of other people who may be indifferent or even hostile to them.

There is no doubt of the abiding appeal to young adult readers of this figure when skillfully handled. Meg Murray in Madeleine L'Engles's A Wrinkle in Time is a fine example of the persuasive power of the gifted outsider. Meg's capacity to love turns out to be her special ability, and those who read her story can feel that the grace of her gifts is within their reach.

Another example, though not rendered with as great artistry, appears in A. E. van Vogt's Slan (1946, revised 1951). In this novel, the adolescent Jimmy Cross has special mental abilities that make him a superman among ordinary people.

A short story does not have much room for developing a character such as Pal beyond a stereotype, but Bear manages to individualize him with some distinguishing traits, the first of which is his ancestry. Pal is a Koreanborn adoptee who feels out of place in California. This characteristic dovetails neatly with Peter's situation as an exile from his native England. Each character recognizes a kindred spirit in the other. Pal's special

talent is not one intended to exploit young readers—it offers no super powers for revenge or for forcing people to pay involuntary attention to him. He is a musician not interested in modern music so much as the music of classical composers like Mozart. The mathematical qualities of classical music are in fact part of what makes it appealing to Pal, as well as part of what makes his talents of special interest to Peter.

By the end of the story, Pal has rounded out into a sharp-minded, lonely youngster, who discovers the joy of an audience he could only reach through mathematics.

Although Pal is very appealing, Bear has singled out Peter Tuthy, whom he modeled on British mathematician Alan Mathison Turing, as a possible reason why "Tangents" is so admired. Peter is, as Turing was, a homosexual tormented by society's aversion to homosexuality. Unlike Turing who committed suicide, Peter has fled to the United States and made a precarious home for himself in California. He loves mathematics and is devoted to his studies, just as Turing was. Pal interests him at first as someone who may help him understand tesseracts, but he warms to the youngster, perhaps through their shared loneliness. For both characters, tesseracts and the music that transcends mathematical dimensions are ways to escape the oppressiveness of their lives. How well they will do in the fourth dimension is not clear, but they seem happy to be there.

"Tangents" leaves some questions unanswered, as short stories often do, the most crucial one being how will Pal and Peter eat, breath, and survive in a dimension that they know little about and that knows less of them? On the other hand, the story's incorporation of a few characters into an amazing exploration of a scientific concept is so exciting that such questions do not detract from the pleasure the experience of the events brings. The way four-dimensional beings chop off sections of the third dimension without meaning to is thrilling—"They don't notice us because we're so small, compared to them," says Pal; the popping in and out of three-dimensional reality is fun. Bear uses soundly drawn characters who undergo intriguing experiences to take his readers on a tour of the implications of a complex idea like the tesseract, and he does so without painful lectures and with much exhilaration.

Topics for Discussion

1. What is a tesseract? Why would it be hard for people to visualize one?

2. How are Pal, Peter, and Lauren alienated from society? How does this alienation affect their adventure with tesseracts?

3. Why is Lauren left behind? 4. How should legal authorities react to the disappearances of Pal and Peter?

5. How well does "Tangents" explain tesseracts? Does the story inspire interest in tesseracts?

6. Are stories like "Tangents" good ways to learn about science? Who might most benefit from learning through stories?

7. Who is the most important character in "Tangents"? How do you know?

8. How does Bear develop the characters in "Tangents"? What would you like to know that the story does not tell you? How would the story tell you what you wish to know?

9. Is Bear exploiting Turing in "Tangents"?

10. Is homosexuality a suitable topic for a short story featuring a young adult? Why would some people object to it? Why would others think that it was okay?

11. Why does Peter tell Lauren to "Tell them it was all my fault"?

12. Pal says that it is fun in the fourth dimension. What would be fun about it?

Ideas for Reports and Papers

1. How have people tried to visualize tesseracts? How do mathematicians draw them? What are their reasons for drawing them as they do?

2. Who was Alan Turing? What parts of Turing's life appear in "Tangents"?

3. What were England's laws regarding homosexuality in Turing's day? How was Turing supposed to be cured of his homosexuality?

4. What about California in the 1950s would have made it more hospitable to Tuthy than England?

5. What aspects of Flatland are reflected in "Tangents"? How are their purposes similar? How are their purposes different?

6. Why were Korean adoptees common in California in the early 1950s?

How have those adoptees fared in America?

7. Write your own story about how tesseracts might interact with people.

8. Write a story that explains a mathematical theorem by showing how it works rather than by telling. How will you capture and maintain the interest of your audience?

9. Bear says that science fiction appeals to young writers because short stories flourish in science fiction. Why would science fiction be especially hospitable to short stories? Why would young writers gravitate toward a genre in which short stories have a large audience?

10. Of what value are mathematical speculations like those about tesser acts? Do they have any applications to real life? Do they need to?

11. Had Peter been declared an illegal alien, what would have happened to him?

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Admires Dinosaur Summer.

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Osprey, FL: Beacham Publishing, 1996, Vol. 1, Biography and Resources, pp. 114-117. Perlberg summarizes Bear's life, career, and critical reception, and she provides a heavily annotated bibliography of resources for learning about Bear.

Publisher's Weekly 244 (December 8, 1997): 59. Likes Dinosaur Summer, although the reviewer thinks the novel drags a bit.

Related Titles

Bear's work, whether written for adult or young adult readers, often appeals as strongly to the audience it was not directed at. Dinosaur Summer (1998; see separate entry, Vol. 9) is aimed at young adults, but can be read by adults with equal pleasure. C. S. Lewis asserted that if one could read and enjoy a story when young and then as an adult read it again with enjoyment, then the story was likely one of substantial merit. Applying this criterion of worth and dual appeal to Bear's fiction, one finds several other crossover works such as "Tangents" and "Blood Music" (1983; see separate entry, Vol. 9), a story which has been widely imitated.

"Tangents" is also written in the tradition of mathematical adventures.

The characters in the story speculate on how two-dimensional beings might view the third dimension. This may show the influence of the novel Flatland by E. A. Abbott (1884), in which two-dimensional characters try to understan d the third dimension. Flatland is a didactic work intended to teach readers mathematical speculations about a fourth dimension by showing two-dimensional characters trying to conceive of three dimensions. Bear takes a somewhat different tack, showing what may happen when four-dimensional beings interact with the third dimension, and implying that music has mathematical qualities that may enable it to transcend dimensions.

Readers of "Tangents" who wish to know more about Alan Turing or who are fascinated by the theme of an intelligent individual destroyed by conflicts with his own nature and a society hostile to his emotional needs might well enjoy Hugh Whitemore's poignant biographical play Breaking the Code, a drama of the tragic life of Alan Turing. This play, produced in 1987 with great success in Britain and the United States, starred Derek Jacobi, the great English actor who became famous in the late 1970s for his portrayal of the stuttering Roman Emperor Claudius in the British TV series I Claudius. A filmed version of Breaking the Code with Jacobi, shown on Public Television' s Masterpiece Theater, should be available on tape. Jacobi brilliantly portrays Turing's childlike gentleness, striking mathematical gifts, crytographical brilliance during World War II, and tormented personal life. The title Breaking the Code is itself a coded reference to both breaking the enemy code during wartime and breaking the social code of moral orthodoxy that no true English gentleman would violate by stooping to homosexuality. Turing broke this code and was abandoned and abused in the most shameful way by a country that owed him a great debt of gratitude.

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Beacham's Encyclopedia of Popular Fiction

Editor
Kirk H. Beetz, Ph.D.

Cover Design
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Library of Congress Cataloging-in-Publication Data Beacham's Encyclopedia of Popular Fiction

Includes bibliographical references and index

Summary: A multi-volume compilation of analytical essays on and study activities for the works of authors of popular fiction. Includes biography data, publishing history, and resources for the author of each analyzed work.

ISBN 0-933833-41-5 (Volumes 1-3, Biography Series)
ISBN 0-933833-42-3 (Volumes 1-8, Analyses Series)
ISBN 0-933833-38-5 (Entire set, 11 volumes)

1. Popular literature□Bio-bibliography. 2. Fiction□19th century□Bio-bibliography. 3. Fiction□20th century□Bio-bibliography. I. Beetz, Kirk H., 1952-

Z6514.P7B43 1996[PN56.P55]809.3□dc20 96-20771 CIP

Printed in the United States of America First Printing, November 1996