

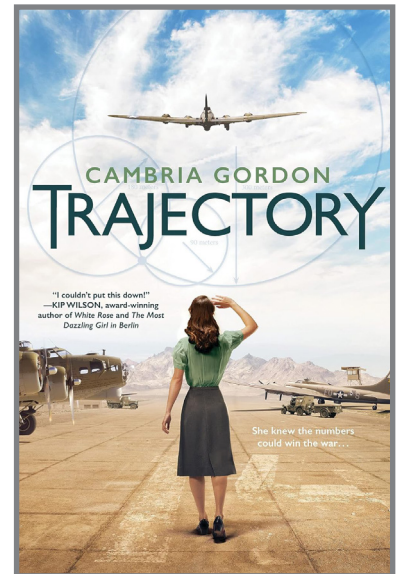
Trajectory

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SCIS: 5490979

ISBN: 9781338853827

RECOMMENDED FOR: Lower to Mid Secondary
(Language, Sexual References)



SYNOPSIS

Seventeen-year-old Eleanor is nothing like her hero Eleanor Roosevelt. She is timid and all together uncertain that she has much to offer the world. And as World War II rages overseas, Eleanor is consumed with worry for her Jewish relatives in Europe. When a chance encounter proves her to be a one-in-a-generation math whiz—a fact she has worked hard all her life to hide—Eleanor gets recruited by the US Army and entrusted with the ultimate challenge: to fine-tune a top-secret weapon that will help America defeat its enemies in World War II and secure the world’s freedom. This could be her chance to help save her family in Poland.

Soon, she’s swept from the basement of an Ivy League engineering school, to the desert of California, to an Army Air Corps base at Pearl Harbor, and finally she takes to the skies above the South Pacific.

But before she can solve this complicated problem, she must learn to unlock a bigger mystery: herself.

Critically acclaimed author of *The Poetry of Secrets*, Cambria Gordon weaves an extraordinary story of remarkable courage and the will to unearth our deepest secrets, based on previously undiscovered true events.

ABOUT THE AUTHOR

Cambria Gordon is the author of *The Poetry of Secrets*, which Ruta Sepetys called an ‘epic, poetic journey’, and co-author of the award-winning *The Down-to-Earth Guide to Global Warming*, winner of the National Green Earth Book Award. Cambria has written for *Los Angeles Times Magazine*, *Boys’ Life*, *Parent Guide News*, and *The Jewish Journal of Los Angeles*. She lives in LA with her husband and youngest son, and as close as possible to her two adult children, without annoying them.

STUDY NOTES

- Before reading the story, discuss the book cover and title. Some things to include in your discussion could be:
 - What can you see happening on the cover of this novel?
 - Where and when do you expect this book might be set? What about the cover illustration makes you think this?
 - What is the character on the cover of this novel doing?
 - What role do you expect this character might have in the action of this novel?
 - What do you hypothesise is likely to occur during this novel, and why do you predict this?
 - Having read the inside panel of the dust jacket, do you wish to amend your hypotheses regarding this novel?

Why/why not and in what ways?

- Aside from her mathematical abilities, what would you say is the most notable feature of the character of Eleanor? How does this aspect of her character contribute to the overall narrative, and what would the story be like were she not to possess it? In small groups, discuss your opinion of the various aspects of Eleanor's character, and how they combine to help drive the overall plot.
- Why is Eleanor's father's speech slurred, and what impact has his disability had on his family's life, and on Eleanor in particular?
- When Eleanor attends the Math Meet near the start of the novel, she is unsurprised (if irritated) that it is overwhelmingly attended by boys. Why do you think this was the case, and what has changed in the 80+ years since the story was set?
 - What is it that keeps Eleanor from entering the Math Meet, and do you think that she has been influenced in any way by the sexism that was endemic within society during the 1940s—or was it purely her personal circumstances and belief that she was responsible for her father's stroke?
- What is the draft and why might the boys in Eleanor's year at school not want to discuss it at all?
- The real estate advertisement on her neighbours' house says 'restricted section' which according to Eleanor's father means that only white people will be considered as purchasers. How and why was this sort of blatant discrimination allowed, and what laws had to change to prevent such overt racism in both advertising and practice?
- What is the value of Eleanor's salary in today's money? Was this considered a good income for a teenager finishing school? What impact would being female have had on offered salaries or wages in 1942?
- When the mother and small boy on the train were told to leave, Eleanor felt sorry for them but didn't want to draw attention to herself by saying anything. On a societal level, what harm can this type of fear of public disapprobation cause in the face of bigotry?
- Individually, or in pairs, research famous or influential female mathematicians throughout history. What challenges did they, almost universally, have to face that would not have existed if they were male?
- Investigate the history of calculators. What functions could the Marchant Silent Speed and its manually cranked predecessor perform? How large was it, and how easy or difficult was it to operate? Compare this to the different calculators that were invented and became available during each decade from the 1940s to the 2020s, concluding your investigation with a discussion of the calculator functions of the average smartphone, as well as a specialised graphing calculator.
- Where is the line drawn between a calculator and a computer? In small groups, discuss the similarities and differences between the two, both in regard to the original humans awarded the titles, as well as the mechanical and electronic variants. What do you think distinguishes one from the other, or is it simply a matter of convention to refer to a device by one name rather than the other?
- Could Eleanor's shyness and quiet nature be considered to be a positive and beneficial character trait in some ways, as well as the challenging impediment she sees it to be?
- When Eleanor was younger, she learnt the entirety of four separate roles for the class play, but as an understudy she was never required to perform any of them. Write a brief piece analysing the metaphor of 'waiting in the wings' and how it could be said to apply to Eleanor's life as shown over the course of the novel.
- In pairs, or small groups, research the relocation of Japanese Americans during WWII. How, and in what way, did the relocation camps differ from Enemy Alien internment camps in the UK and Australia, and from the concentration camps in Nazi-ruled Europe? What are some of the most egregious failings of the operation Japanese American internment program by the American government, and what could have been done differently to minimise the societal and individual harm that these camps caused?
- What is the relationship between censorship and hope, as expressed by Mr Anderson in the air force base library? What are some other reasons for censorship during wartime?
- What is dynamic viscosity, and what relationship does it have to ballistics and atmospheric turbulence? In small groups, investigate these terms, their dictionary definitions, and their contextual usage within the novel, and create a brief explanation of what Eleanor means by her statement, 'turbulence of the ballistic is the issue.'
- Create a rubber band table-slingshot, and attempt to discover exactly how far back it needs to be pulled to fire a

ping-pong ball (or other small ball) into a cup placed on a mark on the floor. Follow the instructions to create the slingshot (ensure all students are behind the slingshot when it's active):

- Tape, or screw, two wooden rulers to the edge of a table, so that they both stick up vertically above the top of the table, approximately 15cm apart from each other.
- Tie a 20cm length of elastic between them, approximately 1cm above the level of the top of the table; this will be your catapult.
- Experiment with how far back to pull the elastic in order to get the ball to roll across the table, and shoot off the edge and land exactly in the cup.
- Be sure to mark on the tabletop, with lead pencil, exactly where you are pulling the ball back to each time!
- The ball does not need to stay in the cup, it just needs to land reliably in the same spot most of the time.
- How long does it take you to
 - Land the ball on the target the first time?
 - Reliably land the ball on the target most of the time?
- Once you are managing to get it in the cup most of the time, experiment with changing atmospheric variables. Turn on a stand-fan next to the table.
 - Does this affect your aim?
 - By how much?
 - What about if you move the fan around to a new place or have it swivelling as it blows?
 - Try misting water into the air directly in front of the catapult from a spray bottle. Does this change your results?
- After concluding your experiment, as a class, discuss what you have learnt about the difficulty of aiming at a simple target, and compare it to the task faced by Eleanor and the other bombardiers.
- Mark on a world map all the different places Eleanor travels to over the course of the novel.
- The people in the cafeteria were confused about how a jet engine could possibly work on a rocket. How does a jet engine work?
- What are the parallels between 1942 USA, and Hitler's Europe, as highlighted by Eleanor's experiences? As a class, discuss the different instances of prejudice and bigotry to which Eleanor is exposed to first-hand, and compare them to the mindset that allowed Hitler's Nazi regime to rise and expand during the 1930s and early 1940s in Europe.
 - Individually, write a brief analysis of the parallels you have discussed, and compare them to instances of prejudice and bigotry that are still present in western societies today. Be sure to include evidence from the text to support your analysis.
- Why was the attack on Pearl Harbor such a pivotal moment in the course of WWII? In small groups, briefly research the attack and how it influenced future events. Share your findings, and discuss them in the context of the individual stories told by characters in the novel surrounding what happened there.

AUTHOR OF NOTES
RAE CARLYLE