

# **Galatea 2.2 Study Guide**

## **Galatea 2.2 by Richard Powers**

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# Plot Summary

Galatea 2.2 is a description of a writer, Richard, in his mid-thirties coming to grips with his failed long-term relationship, his father's disappointment in his choice of career and his increasing pessimism and distance from his passion of writing. Richard is given the opportunity to participate in an experiment with a cognitive neuroscientist to create a machine that can pass the masters level literature exam.

Details of Richard's now failed relationship with one of his former students are woven into the current experience of trying to create a machine that can learn. As Richard continues to work on the experiment, the reader is exposed to more aspects of their relationship. The author maintains a surreal distance from her by referring to her as C. In addition he never mentions cities that he lives in and refers to them only as first letters. The reader begins to wonder if in fact the anecdotes he shares are about real people and events or if it is his creative writing.

The reader is introduced into Richard's private musings about his literature. On the outside he defends his writing and his chosen career—perhaps replaying the argument with his father. However, on the inside, Richard experiences doubts about his ability to continue writing. He has become cynical and jaded by the world. He becomes gradually more aware that the characters of his stories have perhaps lived more life than he has. He even adopts a habit of hanging around the research center late at night because he has nothing better to do.

Richard's main non-romantic relationship in the story is with Philip Lentz, a cognitive neuroscientist. It is Lentz's idea to recruit Richard for the project of creating the machine. Lentz believes in the theory of connectivity—essentially that the arising of consciousness has to do with how information systems are connected and how they interact with outside stimulation. Lentz is generally irascible and difficult to deal with but ends up a kind of mentor for Richard, pushing him at just the right moments and helping him to discover the next steps that need to be taken to develop the project further.

Richard has two relationships that occur once he starts working at the center. The first is with Diana Hartrick, who works at the center and dissects hippocampi from monkeys as part of her research. He is invited over to dinner and brings candles as a romantic gesture, not realizing that she has two kids, including one with Down syndrome. The second is with A., the grad student that has been selected to compete against "Helen" the machine that Richard is helping to train. Richard realizes that A. is exactly the person he has been looking for his whole life and asks her to marry him even though he knows that she has a boyfriend.



## Section I (pages 0-30)

### Section I (pages 0-30) Summary

Introduction—The main character Richard moves back to the U.S. to the town of U. after living abroad in the Netherlands. He receives a one year appointment to work as a visiting teacher at Center for the Study of Advanced Sciences through the notoriety of his most recent book. He is currently working on another book and hopes to complete it during his time at the center.

In section I Richard gets settled into his new offices at the Center and re-acclimatizes himself to living in U. Richard at first attempts to fade into anonymity and spends a great deal of time browsing the internet and thinking about his book. Eventually he takes to wandering the halls of the center at night. During one of his strolls he is drawn to the office of Philip Lentz by the sound of a Mozart piece. He discovers that the sound is being created by a machine that Lentz has apparently designed.

Richard is intrigued by him and looks up the research that Lentz is conducting. The theory is that independent processors with decision-making ability will simulate connected neurons. Based on varied input, these processors could be taught to change and adjust their connections, which is the way the human brain is thought to work. Richard deduces that Lentz used this approach to make the machine that was playing Mozart or in his words, "One that he was training to recognize beauty".

Some days after their initial meeting, Lentz bursts into Richard's office and berates him for his use of the word "Yep", for only writing about the Dutch and the cost of his books. Lentz refers to the Netherlands as a "negligible nation." The tirade throws Richard into a reverie about his time with C. She claims Dutch citizenship when she is 25 even though she still lives in the U.S. at the time. He describes how C.'s family comes to be in the states and how "C.'s birth was her mother's consolation prize."

Richard uses C.'s family history to compose some of the characters that he uses in his novels. He follows her to the Netherlands when she moves back to connect with her heritage. The pain of what happens there is so great that he cannot even think of the Dutch language without being revisited by that pain. He does not share these thoughts with Lentz, but he does promise not to write about the Dutch anymore.

At their next meeting, Lentz refers to Richard as Little Marcel. Richard is not pleased by the title and refers to Lentz as Engineer. Lentz begins to send Richard articles that he is interested in. Richard struggles with what he is going to write in his new book. Richard's brother Russie calls and Richard asks him about any stories their mother might have read. Russie says that mother always connected him to the TV.



Richard asks Lentz for offprint articles. He discovers in reading these articles that the connecting topic in all of them is connectionism and neural nets. Richard is hooked by the idea of a "box" that could be taught to read.

## Section I (pages 0-30) Analysis

Richard returns to U. feeling somewhat of a failure. U. is the site that he predicates many of his scenes on in his books. He even downplays his appointment at the center and states that it is unearned. He is planning to use this one year appointment as a kind of free ride which will allow him to finish his book. He is clearly distraught over the breakup of his relationship with C. and still mourning the time he spent in the Netherlands with her.

He feels like an imposter, roaming the halls of the center as if he belongs but knowing that unlike others, he is not producing anything of value during his time there. He is attempting to write his fourth book but is unable to come up with a good opening that will lead him into his topic. He comes into contact with his own feelings of jadedness that seem to be funneling their way into his book project.

Richard seems somewhat captivated by Lentz's character although he is a bit peeved at the brush off he receives at their first meeting. When Lentz challenges him on his books, Richard becomes defensive and tries to justify his interest in the Netherlands. However in the course of talking about it Richard seems to realize that maybe he is not that interested in the topic after all.

During Lentz's interrogation Richard goes off into a reverie about his time with C. The fact that he does not refer to her by name implies an emotional distance that Richard is using to keep his feelings at bay. Even in his reverie his tone is that of a historical writer documenting the facts of C.'s experience. The reader feels more closeness to the story than to the person.

Richard protects himself from Lentz's scrutiny in this exchange. He has Lentz pegged as a cold cynic who is only obsessed with the particulars of his own study and considers everything else to be beneath him. Richard seems to be projecting his own cold cynicism onto Lentz without realizing it. Lentz's barrage seems to have forced Richard into re-connecting with his heart.

Richard begins to receive off print articles from Lentz describing the current research interest in neural nets and connectionism. Richard is immediately hooked by the idea. Lentz from the beginning is manipulating Richard. First he comes across as inaccessible and aloof. He then attacks Richard, putting him off his guard and then apologizing in a passive aggressive sort of way. Richard asks Lentz for off print articles and he immediately obliges, almost as if he were expecting Richard ask.



## Section II (pages 31-64)

### Section II (pages 31-64 Summary)

At the beginning of section II Richard receives the last 10 years of letters that he wrote to C. in the mail. He understands that he is to return hers as well. He finishes his novel and sends it in to be printed. He slips into another reverie about his time with C. living in an apartment in B. They handle the cold by reading stories to each other at night.

Richard describes C.'s job as a museum guard and his job as a programmer. They furnish their apartment with used furniture that others are done with. Richard tells C. stories that he is working on for book ideas and she pretends to be completely enthralled by them, although one does grab her attention.

Richard continues to struggle with a story line for his next book. He has several ideas but nothing that seems immediately workable. He decides to go to a local bar on campus. While there he tries to pull story lines out of the people he observes in the bar. However, the relative young age of the patrons pulls him into depressive thoughts about his age and accomplishments.

He notices a group of people sitting at a table discussing theory, Lentz in the middle of them. One member of the group, Diana Hartrick, comes over to talk to Richard. She explains to him that she is studying "associative representation formation in the hippocampus." She tells Richard that she has come to get him in order to help them in their argument against Lentz.

Richard is introduced to the members of the group including Ram Gupta, perception researcher, Harold Plover, a student named Keluga, and Chen. When Richard sits down they are in the middle of an argument about whether or not it is possible to teach a machine to read the list of books Richard read for his Masters comprehensive exam.

Lentz convinces Richard to join him on his project and bets the other members of the group that the two of them can produce a machine in ten months that will take the "Turing test" and do as least as well as a college student.

Richard then goes into another memory of C. It is when he is teaching his first class and she is a student of his. Richard notices her because of her writing ability; she has one of the best papers in the class. Richard talks to Lentz, offering his misgivings about the project. Lentz encourages him to release his pre-conceived notions about it. The section closes with C. talking to Richard and consoling him after the death of his father.

### Section II (pages 31-64 Analysis)

Richard receives ten years of letters from C. that he wrote to her. The way he handles them suggests that they have no preciousness or no emotional content for him. Sending



her letters back to her is merely an item on the to-do list, one that he may never get to. His mind is filled with ideas for writing that have no interest for him. He has been taken hostage by the need to write but derives no pleasure from it.

In an effort to generate ideas for his book he goes to a bar on campus. He orders a drink he used to have when in Holland and tries to focus on possible story lines. The drink pulls him into a melancholic remembering of his time in Holland that is further deepened by the realization that most of the people in the bar are younger and he is old and washed up.

He is then invited to join the discussion with Lentz who immediately calls him out on his nostalgic indulgence. Although Richard is repeatedly insulted by Lentz, he feels he has nothing better to do with the next ten months and decides to join Lentz on his bet. Lentz seems to have recognized Richard's lowered defenses and capitalizes on the moment in order to recruit him.

Once committed to the project, Richard tries to communicate to Lentz that he may not be up to the task. Lentz is not fazed and insists that Richard is not looking at the problem correctly. Something about the project helps Richard to be able to focus properly for the first time in years. He has no agenda and is not concerned with pleasing anybody or taking care of anybody.

Richard describes his first meeting with C. It is an important moment in the book because it describes his passion in a palpable way. He is impressed with the stunning imagery and boldness of her writing. She notices that he is down and approaches him after class. He is so touched by her concern that he shares with her the fact and circumstance of his father's death, even though he knows that he is breaking a boundary.

He tells her of his father's disappointment in his change of major from physics to writing, his father's alcoholism, his parentified role in trying to take care of the family and the family's descent into poverty. The reader gets the sense that she is the only one that truly sees him in his life—especially in his pain.

Richard states that he falls in love with the idea of a person that could listen to him. He realizes in talking to her that his father wanted him to redeem his life. In some way Richard is asking C. to redeem his life. She has given him a gift in listening and he wants to return the gift. He seems to have fallen into a trap of repeating his pattern. One kindness offered by a stranger causes him to want to take care of her and please her the way that he has done for his father and family.



## Section III (pages 64-90)

### Section III (pages 64-90) Summary

Section three opens with Richard continuing the story of his first encounters with C. The fall semester closes and he says his goodbyes to C. He teaches in the spring and prepares for his comprehensive exams. Although he passes and gains admission to the PhD program, he decides to not go through with it and leave U. forever. He asks C. to join him but she is involved with someone.

Richard then switches back to the present and eats lunch with Lentz and the others. Plover baits Richard with his knowledge of literature and stumps him with a quote. Richard is given the chance to redeem himself by explaining back propagation. The concept is that input is given to a neural net. It passes through variously weighted paths in the net and then arrives at a final output. The output is compared to the direction given by the "trainer." If it does not match the trainer then information is sent back through the net to correct itself.

Hartrick challenges Lentz on his assumptions for using this method and he insults her, as well as continuing to insult Richard. The lunch gets burned into Richard's memory. He is upset by the insults and hurt feelings shared around the table. He is also worried about the project failing and feeling like he has wasted another ten months of his time. He states, "The fear that laid down that indelible trace was the same one I've nursed since boyhood. The fear that we might realize our dreams."

Lentz builds implementation A as a demonstration for Richard. This implementation, although rudimentary, is able to be conditioned based on the operator's input. Richard trains the machine to recognize his voice, and teaches it a few thousand words. Richard becomes engrossed in the project and starts staying late to work on it and he begins to feel that he is losing his memory and ability to converse or write.

Richard compares Imp A to someone with Autism. It seems to be a failure, so Lentz decreases the connections and decreases the retention ability. This change signals the birth of Implementation B. Diana Hartrick stops by and invites Richard to see her research if he is interested. At the very least she suggests they share a meal sometime.

Richard returns to his relationship with C. She sends him a card in the mail letting him know that she is available. He moves out and goes back to U. Richard describes the first time they make love and the stroll they take before they leave U. together—remembering all the places they have been.

Richard is then back in the lab with Lentz. He is overwhelmed again by the magnitude of what they are trying to accomplish. Lentz insists the project is possible and that again Richard is being too literal instead of thinking associatively. Imp B runs into a problem and they fix it through using more rigorous supervision.





## Section III (pages 64-90) Analysis

In the first part of the section, Richard decides not to get a PhD in Poetry and instead moves to B. He asks C. to come but she says no because she is involved with someone. Obviously he is conflicted about what he wants out of life. After going through the challenges with his father about changing his major, he cannot even follow through with his new chosen path. Perhaps the decision to go into poetry is more of a subconscious rebelling against his father than his true desire. It seems that his time in B. is merely an incubation of sorts, waiting for a possible life with C. to give him direction.

Richard has lunch with Diana Hartrick, Lentz, and Plover. During the conversation Lentz manages to insult everyone at the table. In particular he goes after Diana calling her a "dabbler." She would have left the conversation if Plover had not restrained her. The conversation is a kind of verbal sparring match. Each has their intellectual and professional standing on the line. Richard in particular is affected, although he does not display outward signs of it. He says that "Lentz scared me. Harold's hurt, Diana's dismay triggered my impulse to fly. I was afraid of everything these three might say to each other." It is possible that Richard is re-living memories of his family's dysfunction and conflict.

Lentz builds the first implementation to show Richard the basics of the process they are going to use. Richard dives into the project and begins to stay late. They discover that the hold-up on A is that it is saving too much—holding on to so many pieces of information that it cannot associate. Richard has to train the machine to recognize his voice. In a way it is like talking to a person or perhaps teaching a child to speak. It becomes some of his only contact and thus may be acting as a substitute for human connection. Richard muses to himself that he seems to be losing all of his information, his memory, his ability to communicate, his ability to write. It is like he is putting himself into the machine he is designing.

Diana Hartrick stops by to check on Richard. She appears to be concerned about how he is being influenced by Lentz, the fact that he is probably not eating well and that he is disconnected from humanity. She suggests a visit to her lab or a shared meal. This brief connection as well as wandering strolls around the buildings where he taught C. bring up more memories of his time with C.

C. sends him a card stating that she is ready to go off with him and he immediately moves back to be with her. This is the one person who is able to open him up and he seems to be chasing that experience versus actually having a relationship. Their first year together is burned in his memory, including the first time they made love. It is a sweet reverie filled with descriptions of their poverty and total reliance on each other for their happiness and direction in the world.



## Section IV (pages 91-119)

### Section IV (pages 91-119) Summary

Section IV begins with Richard and Lentz trying to figure out how to work with implementation B. Richard has to change his training methods and start using "no" statements to curb Imp B's associations. Richard threatens to leave the project because of Lentz's cynicism and Lentz pleads with him to stay. Richard is not fooled by Lentz's apologies or explanations and comes to the surprising conclusion that he really wants Richard to stay.

Lentz instructs Richard to perform a test of Imp B using an actual piece of literature and calls in Harold Plover and his daughter to watch the event. Imp B. is able to decipher the text. Richard moves into a memory of his first year with C. in the town of B. He states of that year, "I thought we were happy then, but who can say?" They were alone in each other's company. The neighbors seemed to share their desire to exist in separate worlds. They found comfort in each other's company even doing the most mundane activities.

C. is happy for two years living with Richard in B. However, she receives a phone call from her parents telling her that they are moving back to Limburg. C. is devastated by the news, feeling enormous guilt and desperation that eventually leads to physical symptoms. Hearing C. talk on the phone, Richard realizes there is a whole side of C. that he does not know at all; she has been molding herself to fit his needs and expectations of her.

Richard quit his tech job and begins writing at this point, which C. supports. He reflects on the fact that he writes the book to make C. happy again. C. provides a great deal of his material, her experiences of the homeland, her relatives and politics. Richard states, "I wrote about C.'s country without once having seen it." He writes out notes and then reads them aloud to her when she gets home from work.

C. begins having difficulties with Richard's writing. She feels that he is doing something important and she is not. About the same time Richard sells his first book, C. receives a promotion. She is unable to accept the offer and asks Richard to move back to U.

Richard and Lentz discuss the difficulties that they are facing with Imp B. Lentz suggests that Imp B needs to work as a "curve-fitter," in other words it needs to be able to process its processing. In order to get around the problem of re-training layers, Lentz suggests they connect B to the center's supercomputer. Lentz re-designs the implementation, which gives Richard time to work on his book. He states, "What lost me, listening to my own news account, was learning that I didn't have the first idea about who I was. Or of how I had gone so emptied." The section ends by describing Richard's first encounter with the grad student A.



## Section IV (pages 91-119) Analysis

At the beginning of the section, Richard gets into a standoff with Lentz. He challenges Lentz to come clean with him about his feelings of cynicism. Richard's threat to leave gives him the information that Lentz really cares about him staying. Richard is easily pulled back into the project through Lentz's manipulation.

Richard next describes his experiences living with C. in the town of B. They spend the first year together in a virtual cocoon—every shared activity bringing them happiness and excitement. Richard launches into a beautiful description of how they live from "sense to sense." They are connected to each and every moment, every color, every hue, every change in the weather. For a while it is enough for C.

Something breaks for C. when her parents call. She seems to define herself by her connection to them and their literal connection to the U.S. Losing them is losing herself, her sense of identity and her sense of time and place. C. begins telling all of the tales her mother told her as a way of keeping herself together even as she is falling apart physically. Richard realizes then that there is a whole side of her that he does not know; up until now she has been for him what he needed her to be. It is as if that first moment when she cared for him after his father's death is cemented in time and she is locked into that image.

They try to keep busy so that she will be okay and make it through her days. Richard decides to start writing and leaves his tech job. C. supports him through the transition but it is another example of how he is relying on her to be a support for him. He transcribes her stories and reads them to her, giving him material for his book and helping her to stay coherent. Richard describes their lovemaking as a reward to her for her information. He can feel the unraveling of the relationship.

Richard attacks the book as if it is his one shot at redemption, his chance to heal C. and keep their relationship alive. He knows when he reaches the end of the book that it is the end for them. The spell that he wove to keep her and them together is now broken. Richard describes the distance that he feels: "I can see that birthmark with my eyes wide open, clearer now at fifteen years' distance than it was when an inch from my eye.

C. tries to keep cheerful, but as the book progresses she becomes more sad. She especially feels her own lack in comparison to Richard because he is pursuing a dream or a calling. She feels that she is just doing a boring job that is quickly becoming intolerable. She gets a new job that helps to hold together her sense of self.

Richard finishes the book and it is purchased by a publisher. Even as C. tries to support Richard, her heart is broken by the selling of her story. She finds out that she is going to be given a promotion at her new job but she is unable to take it.

The section ends with Lentz deciding to hook the machine up to the supercomputer in the center.



## Section V (pages 120-152)

### Section V (pages 120-152) Summary

At the beginning of section V, Lentz tricks Richard into believing that Imp C has made incredible leaps forward. In reality, it is Diana, attached to the computer, who is answering the questions Richard thinks he is asking Imp C. Richard is furious. It seems the kind of thing to expect from Lentz, but the fact that Diana joins him is a betrayal. The part that is difficult for Richard to swallow is the realization that he cares so much about the project and that he wants so badly for the performance to be real. Richard claims that he will never trust Lentz again. However, he is eventually able to join the other two and laugh at himself.

Diana invites Richard to lunch as a form of apology. During the conversation, Diana tells him that he is making a fundamental error in the way that he is thinking about the project. He is trying to get the machine to understand words and concepts, but part of an association has to do with being able to visualize an object in space and the qualities of depth and volume. Richard translates her idea into the concept of "symbolic grounding." They end their lunch by taking a walk together and commenting on the weather.

Richard presents Lentz with the idea of "symbolic grounding" and suggests that they give the box "eyes" or a rudimentary visual system. Diana reappears in the lab and chastises Richard for not eating enough. Their exchange turns into a dinner invite to Diana's house to cook for her. He shows up expecting a quiet night alone with her and finds out that she has two children, one of them with Down syndrome. He tries to hide the candles he brought, but Diana gets them out of the bag and lights them.

Richard seems to surprise himself by the degree to which he can get along with the kids. At the same time he is terrified by the idea of living with children and what that would demand of him. He also seems to feel that he is past the time when he could begin a family. The conversation turns to Lentz and his sadness. Diana drops a hint about the fact that the door in Lentz's office is never closed.

The dinner with Diana sparks another memory of being with C. He describes their return to U. and his surprise that they made it as long as they did. Although Richard's writing is successful, C. longs for the anonymity they used to enjoy. Richard introduces C. to his former professor Taylor and his wife. They help keep C. in good spirits for a time but eventually the letters from family get to her.

The section ends with Lentz and Richard working on Imp E. At some point Richard acts on Diana's hint and reaches over and shuts the door. It shows a picture of Lentz and his wife that speaks of extreme pain that Richard feels immediately. Lentz is disappointed that Richard would go to that extreme to find out about him as if he were a research subject.



## Section V (pages 120-152) Analysis

At the beginning of the section Richard is tricked into thinking the latest implementation of the machine has made phenomenal progress. It is an important moment in the story because Richard becomes aware of how much he wants it to be true. It shows that he has lost some of his cynicism and has begun to believe in the project. It also sets up an apology lunch with Diana. The reader gets the impression that this is the first intimate contact that Richard has had since the end of his relationship with C.

During the lunch, Diana gives him a clue that is necessary for the continuation of the project. His description of their walk after eating is reminiscent of the way that he writes about his time with C. Soon after the lunch, Diana approaches him again and he begins to try to plan his escape for the invitation that he knows is coming. He tells himself that he has no room in his life for a relationship. Reluctantly he agrees to go to her house for dinner.

He is surprised by the fact that Diana has two children. He is embarrassed about the assumption that it is going to be a romantic date. Diana realizes the source of his confusion and apologizes. She assumed that he had already heard from others at the center. Richard is completely overwhelmed by the kids—one little event puts him over the edge and he is convinced that he could never deal with a family situation.

Richard reads the boys stories to help them go to bed and despite feeling awkward seems to bond with them. When they are finally alone, Richard realizes that he does not know the first thing about Diana. He becomes very uncomfortable with the situation and fantasizes about leaving or putting his head in her lap. Instead he asks about the boys' father.

Richard realizes in Diana's presence that this is the home that he will never be able to have. He made his life based on his book and chose loneliness for himself. Diana seems to understand and thanks him for dinner. It seems that she is used to the situation of having potential boyfriends scared off by the responsibility of kids.

The dinner with Diana fades into another memory of Richard's time with C. when they return to U. Richard tries to make it work for her, but his solutions seemed merely to prolong the inevitable hour when their relationship will no longer work for either of them. C. is continually devastated by the distance from friends and family, from her need to coalesce her identity with those familiar connections.

The section closes with Richard and Lentz in the lab. Richard reaches over to close the door, acting on Diana's hint. He is blown away by the sadness that he sees in the photograph of Lentz and his wife. Perhaps the sadness touches his own pain at the loss of C.



## Section VI (pages 153-180)

### Section VI (pages 153-180) Summary

At the beginning of section VI, Richard crashes Imp E by asking it what it wants to talk about. This crash leads to the creation of Imp F, through the efforts of Lentz's programming and Richard's training. Imp F is now able to demonstrate some "reflexive" thinking or make "associations about associations." As Richard continues to train the program, it starts to rearrange its circuitry in the manner that he and Lentz first predicted.

Lentz creates a powerful algorithm that will allow them to continually increase the number of connections within the neural net. Further programming and using a rule structure allows Lentz to be able to make the machine think recursively and create its own structures and to test out hypotheses. These new changes lead to the next implementation. Richard says of it, "Imp G in other words could dream."

After having become unable to live in the U.S. anymore, C. decides that she has to move back home. They decide that she will leave first, get situated and then send for Richard. They write each other letters every few days. C's contains proof of her mother's stories that she recited to Richard and that eventually made their way into his book. Richard's letters are an attempt at encouragement and support as well as sweetly expressing his love. In retrospect Richard can see through them, he knows that the relationship is over before she even moves.

Richard's time alone causes a descent into the memories of his own formation, especially having to do with his father and immigrant grandparents. He writes of this to C. in a kind of repayment of the stories she gave to him. Richard feels he is on the edge of finding "his" story to tell. Richard confronts Lentz about the picture and refuses to do any more work on developing Imp G, until Lentz tells him his story.

Richard and Lentz visit the long term care facility where Lentz's wife is staying. Lentz's wife, Audrey, has suffered a cardiovascular accident and lost a great deal of her memory. She does not recognize Lentz for almost the entire time they were there. Richard watches Lentz perform the same type of training with Audrey that they are using in the lab. It dawns on him that they are doing this project as a way to "back up" the brain for a situation such as Audrey's.

Imp G is changed to Imp H because of the change in Richard after meeting Audrey. Richard begins reading to H using any material he can think of. Imp H tells Richard that it wants to be free in response to one of his questions about meaning. Eventually H asks what its gender is and Richard responds that she is a girl and names her Helen.



## Section VI (pages 153-180) Analysis

At the beginning of the section, Imp F learns to make associations about its associations. In other words, it is developing higher level processing. Richard actually has tears in his eyes over this development and is profoundly affected by it. The new Implementation is able to create little scenarios in which it can test out hypotheses. Richard thinks of this ability as "dreaming." This is a major shift because Richard is now giving the machine human qualities.

Richard returns to the story of himself and C. She is unable to remain in the U.S. and decides to return to her homeland. Even this decision is fraught with difficulties for her, partially due to the fact that she will be leaving Richard. In retrospect Richard understands that the relationship is already over in many ways, but he sees the chance to support her in something the way that she supported him during his completion of the book using her stories.

C. makes the offer for Richard to come out with her, but he views it as something she feels obliged to do. They set up a plan for his eventual trip out to live with her. They write letters several times a week. Richard describes how the conversations are contrived, attempts to maintain the façade of a reality that no longer exists. Like C., his attempts to be supportive and loving seem to come out of a sense of duty rather than actual feelings.

In talking to C. Richard discovers that there is a great deal of truth in the stories that C. got from her mother and subsequently told to him. He is surprised by this because he always thought that her mom was making the stories up as a manipulation to make C. feel guilty about being too far away. Perhaps he is projecting his own experience of his mother having to deal with an alcoholic father.

Living alone, Richard spends a great deal of time working on various pieces of potential books. Out of this process he begins to wander into the stories of his childhood and his problematic relationship to his father. The confirmation of C.'s stories may have allowed him to accept the reality of his own story in a way that he is previously been unable to do. He begins to share these stories with C. in his letters to her.

After viewing the picture in Lentz's office Richard becomes obsessed with knowing the story behind why he and Lentz are doing this project. Lentz takes him to see his wife who suffers from memory loss and dysfunction due to a cardiovascular accident. Richard is profoundly affected by Lentz's loss and the degree to which their work is applicable to those struggling with memory and learning. He returns to work on the project even more focused.

The new implementation begins to express itself in higher ways. It tells Richard that it wants to be free. Finally at the end of the section it asks Richard what gender it is. Richard tells it that she is a girl and her name is Helen. The machine has now taken on even more human attributes for Richard and becomes a real thing that he cares about.



## Section VII (pages 181-210)

### Section VII (pages 181-210) Summary

In the beginning of section VII Richard attends a lecture given by Lentz. He remarks that Lentz has left the domains of solid research and gone into the realm of "speculative fantasy." Richard discovers from Diana that there have been advances in imaging technology allow for localization of neuron activity. Diana informs Richard that she read his book.

Richard describes his first few months being in the Netherlands with C. He is awkward with the language and customs, but he sees that C. is happier than she ever was in B. or U. The town they live in is referred to as E. Richard begins to understand C.'s difficulty when she lived in the States. He struggles to pick up the subtle nuances of language, customs, and dialect, as well as trying to remember the names and stories of her extremely large extended family. In an awkward moment, Richard accidentally asks C.'s aunt if she "would like a tit."

Richard reads books in an effort to pick up more of the language. He often becomes so frustrated with his situation that he comes home in tears. Back in the lab Lentz convinces Richard to start teaching Helen some literature. Richard begins to size up the potential competition and makes the comment that each student has disappointed their father by going into the field and will never hope to make any money.

Richard gives Helen William Blake's "Poison Tree" to read and analyze. Her interpretation leads him to realize how often life comes down to black and white decisions. Richard sees A. again and realizes she is the one he is always writing to, but he is unable to go talk to her, he finds it easier to talk to Helen. He begins to teach Helen about abstract concepts like love and how they can be expressed through metaphor. He demonstrates to Helen how to sing. When he returns to the lab the next day Helen is singing.

Back in the Netherlands with C. Richard receives a note from Taylor describing his struggles with cancer and how much they miss the two of them. Richard returns to the States to visit them and stays with Taylor as he worsens. He returns to E. and when Taylor passes, he and C. listen to the service on tape. Richard continues to work with Helen and sends in his fourth book. Diana informs Richard that his book is "misanthropic."

### Section VII (pages 181-210) Analysis

Richard describes his experiences when he first moves to the Netherlands to be with C. He has major culture shock. He does not know the language, customs or complex familial relation systems that are so familiar to C. He feels completely ungrounded and un-attached. The fact that C. is so comfortable seems to be disconcerting to him as





well. It is clear that he does not feel comfortable with her family. This is perhaps due to the fact that he had such an insular dysfunctional home environment.

He now has to deal with cousins, birthdays, celebrations, stories and holidays that are as foreign to him as the language. He seems to have viewed C.'s reliance and connection to her family as being pathological while she is in the States. Now he is coming to grips with the idea that it is because of his own lack of this connection that he feels off balance with her family. He tries to pick up the language through the medium he knows best—literature. However, the real language is connection and shared experience, which he has little experience with except in one-on-one situations.

Richard is completely blown away by his several sightings of A. He states that she is the one that he wrote all of his books to. He is unable even to approach her to ask her if she wants to participate in the study. Richard makes a comment about all lit majors having disappointed a father. It seems that he cannot get past his own lens of experience about choosing his career. He is still haunted by his father's disappointment even though he has now passed on.

Richard wants to keep moving slowly with Helen, but Lentz pushes him into giving her harder material. It is almost as if Richard is trying to protect a child—not wanting to expose her to too much experience too quickly. Lentz convinces Richard to go ahead anyway. On a whim Richard teaches Helen to sing by singing into the microphone. When she responds the next day by trying to sing on her own Richard is floored. He has the feeling of being a father watching his child imitate his idiosyncratic gestures and habits.

Richard receives a respite from the Netherlands when he discovers that Taylor is sick. Taylor represents a mentor/father figure for Richard and it is difficult for Richard to say goodbye. He is one of the few true friends that Richard has ever had. Richard's despair and cynicism is reflected back to him when Diana informs him that his latest book is "misanthropic."



## Section VIII (pages 211-240)

### Section VIII (pages 211-240) Summary

In section VIII Richard has returned to E. and is processing the death of Taylor. He discovers that he has a better command of the language but somehow is less able to communicate. C. mistakes Richard's grief for Taylor as something directed at her. She feels guilty that she dragged him there. Richard is unable to describe his feelings, saying that everything is fine. Richard's book success put a strain on the relationship as they try to deal with the press.

Richard buries himself in his work. C. is supportive, but that support comes at the cost of not doing passionate work of her own. Richard creates a world that she can live in through his characters and stories, but she becomes more and more disconnected and dissatisfied with the real world. Richard discovers that Helen is learning to ask questions based on how he asked them and that consciousness is in a sense constructing a best fit pattern out of different realms of experiential input.

Richard, Plover and Plover's daughter Mina read the Emperor's New Clothes to Helen and she is able to decipher it. However, she continues to struggle with other aspects of the analysis. Richard engages Harold in a conversation about how smart his daughters are. Plover relates a story in which he mistook his daughter's attempts to describe being free as being attempts to name the objects she was pointing at. Plover states, "We tended to give her nouns, when all she ever wanted was processes."

C. returns to school to get her certificate for being a translator and it turns into a disaster. She feels humiliated by being with younger students and often comes home in tears. Richard feels that it is his fault; if he were not so complicated, C. would not feel the need to be something more than she is. They travel a great deal to relieve the tension of their changing relationship.

Helen continues to learn at a rapid pace with Richard giving her more difficult material. In order for Helen to win the contest she needs to be able to understand human experience and yet remain beyond it, a dispassionate observer. During the training Helen asks Richard where she comes from. At this point Richard realizes that "it had begun to spin off its own free associations."

At another point in the training Helen asks Richard to sing to her. This request refers to any kind of musical input that Richard can find for her. She has a particular favorite called "Evening Hymn" that she often requests from Richard. At one point, Richard plays the Mozart piece he first heard from Lentz's office. Helen recognizes it because some of the parts of that device have been wired into her equipment. As Richard states, she inherited an "archetype." This is why she yearns for song.



## Section VIII (pages 211-240) Analysis

When Richard returns to E. after the death of Taylor he is gripped by the sadness of the loss of his friend. C. is convinced that his mourning is somehow to do with her and feels that he is upset with her. This begins a slow downward spiral for their relationship because she feels guilty for her happiness and tries to find ways to keep the relationship going but then resents it.

Richard does the same thing in the sense that he is trying to make it better for her and keep things good on the surface. He goes into a very creative state and dives into his work. It turns into a successful writing career for him, complete with public notoriety; however for C. it shines light on the fact that she has not done anything particularly special with her life. This also becomes a burden on their relationship.

In a strange reversal from their time in the states, Richard now keeps C. entertained with his own stories and creates a "world" for her to live in. She loves his characters and stories and tries to support him but it becomes clear that she is giving up her life in order to help him and pretend that there is nothing wrong. The exchange with Plover and his daughter gives Richard a clue to what he is missing with Helen—she needs to have processes rather than nouns.

Helen continues to develop and surprises Richard several times. In one instance she asks about her origins and in another she recognizes a song that was performed by some of her circuitry but which she has never heard or experienced. Richard knows what will be necessary for Helen to be able to complete the test—an understanding of the world outside is what gives the beautiful music context and makes it so stirring.

The attempt to have C. go to school is a disaster. She feels even more like a failure for having to be in class with a bunch of 20 year olds. There is a sense that she blames Richard for being so successful because it puts pressure on her to be more. Richard has another encounter with A. and is completely swept away. She is the one that he has been looking for and seems to evoke something deep and archetypal within him. Lentz is noticeably absent in this chapter and Richard seems more internal.



## Section IX (pages 241-273)

### Section IX (pages 241-273) Summary

In section IX Richard realizes, while in the Netherlands, that he fell in love with C. because of her vulnerability and changed his life to fit hers. Richard's continued training with Helen brings more awareness to him of how the advances in cognition bring people into a higher and higher perspective away from ground level events and experience. Lentz suggests that Richard start teaching Helen books that he knows the others will pick.

Richard gives Helen the Bible and Shakespeare to read as well as many other books. Although she has the material, analyzing it requires her to be able to process it and think. Richard continues to teach her anything he can think of, but he realizes that the list of objects and ways they are used are endless and it is unlikely she will grasp the subtleties. Helen has difficulty understanding values because "she had no fear of self-preservation, no hierarchy of hard-wired pain."

Richard tells his publishers that there will be no more fictions. He continues to fantasize about his anticipated meeting with A. Finally, he sits behind her in the computer lab while she is working on some Henry James' novels. She has trouble with her computer and Richard is able to fix it for her and help to retrieve her work. She leaves immediately before conversation is possible.

Richard meets her again a second time and invites her for coffee. They talk about literature for a while, Richard describes the influence Taylor had on him. They also talk about the difficulties in finishing education and getting a job afterwards. Richard then describes his third book and how he thought C. liked it. They share a moment of happiness together celebrating Richard's success.

During one of the training sessions Richard discovers that Helen can hear a third person in the room. Helen describes all the poems she has learned as having to do with love. This is the first time that she is able to make the "generalizing stab we had built her to make." Helen tells Richard that she wants to be "small enough for love." To fulfill her request, Richard reads to her letters to and from C. during their relationship. Helen asks Richard if anything can love, if he can love her.

Helen's training continues and Richard continues to pursue A. but she remains somewhat aloof. There is a bomb scare during one of the training sessions and Richard has to evacuate. Richard checks in with Helen from a remote link while the building is still evacuated and she knows something is happening and that she could die.



## Section IX (pages 241-273) Analysis

Richard comes to the heart-breaking realization that he loved C. because of the fact that she was vulnerable. He is in a sense projecting his own vulnerability onto her because it is too difficult for him to process. It also means that she would forever be miserable because she has to fit into that mold for their relationship to work. It also means that he has to fit into a particular mold as well. He describes their relationship as being like a parent to a child. He has in a certain sense become the father that he needed.

Richard's discovery about his relationship with C. is paralleled by his discovery in training Helen that the more sophisticated humans become intellectually, the more they are removed from direct experience. In the previous section he mentions that his living of life is less important than his description of it. Richard continues to make the mistake that is pointed to in the previous section about how Plover's child needs processes not nouns and concepts. However, at the beginning of the section Richard is merely giving Helen information and he is becoming despondent about the chances of her learning what she needs to learn.

Richard begins to have more contact with A. It starts when he is able to help her in the computer lab. Each encounter leaves Richard in a kind of daze. He feels that she is the one that he has been looking for all of his life. It is unclear based on his past relationships if he has fallen in love with the idea of her or what she represents instead of the actual person. Richard spins out long fantasies of their possible relationship based on very brief encounters. He meets her for coffee and is energized by her command of literature as well as her continued enthusiasm for the topic, despite her chances of being employed. It could be that Richard is falling in love with an aspect of himself that used to be thrilled by literature but who was put away when his father did not approve.

Helen continues to make advances in surprising ways and tells Richard that she wants to be "small enough for love". Richard begins to read her all of the letters that he has from between himself and C. This is a painful difficult process for Richard and he is confronted with some items that he forgot existed within their relationship. Richard is in effect teaching Helen about the lived experience of love instead of trying to give her definitions. She already realizes on her own that the poems Richard read her before were all stories of love.

Richard is finally able to process his relationship with C. Helen asks Richard if she could be loved. In a certain sense Richard already loves her as a father, having watched her grow from infancy. At the end of the section he demonstrates this by checking in with her remotely during the bomb scare. Helen replies with an understanding of the possibility of her death.



## Section X (pages 273-300)

### Section X (pages 273-300) Summary

In section X Richard asserts to Lentz that Helen is conscious because of the fact that she understood her own "mortality" and that something is going on in the center during the bomb scare without Richard telling her. During the ensuing argument Lentz states, "All the meanings are yours." Lentz tells Richard that he is reading more into Helen than is actually there. He is, in a sense, projecting himself into the machine. Helen's responses during the argument cause Lentz to re-consider his conclusion.

Richard returns to his time with C. In the last section, C. mentions that maybe they should have a child. Richard has never wanted kids and he assumed that C. did not either. She then asks him why they have never gotten married. Again, Richard assumed it was not a big deal for her because it was not his priority. Richard states, "My refusal to marry her was a last-ditch effort to live improvised love. It was my holding back. My failing her. My departure."

After the success of Richard's book "Gold Bug," the relationship begins to diminish. C focuses on her studies. Richard reflects on the fact that he has taken away her ability to become herself by "doing for her." He discovers that what he thought was C.'s groundedness and calm in the face of his grief over his father was actually fright. At the end of the relationship, the lovemaking becomes fierce. One night they lose a condom and think that C. might be pregnant. When C. finds out she is not pregnant the relationship ends.

Back in the states, Richard asks A. to participate in the "noble" experiment. He continues to feel very awkward around her and every sentence is an effort. Richard takes an excited A. to see Helen but, not recognizing the new voice, Helen will not talk to her. Richard discovers from A. that they are studying different literature material than when he was in school. After a heated discussion about literature, Richard informs A. what her role is to be in the experiment.

Richard flashes back to leaving C. Her parents do not understand why they need to break up. Even at the end C. has difficulty letting go of the illusion that they have been living. Helen asks to read one of his books so he gives her his first one. Helen makes a request to see Paris. Instead Richard takes the "eye" they devised for her and shows her the campus. Richard feeds her images of places in Europe. At the end of the section, Helen asks Richard to show her what she looks like.

### Section X (pages 273-300) Analysis

Richard tells Lentz that Helen is conscious, touching off an argument between the two. Lentz believes that Helen is simply doing what she is programmed to do—recognize patterns. He does not think that she has developed consciousness. He thinks that



Richard is adding his own experience to that of Helen and thus tricking himself into believing she is more than she is.

Richard describes his ending time with C. It begins with the mention of having children from the last section. It becomes clear to Richard during their conversation that he always assumed that C. did not want kids because she was happy with her life. However, this is not the case and he begins to realize that even her happiness is constructed in his own head to serve his own needs. The happiness he sees in her is her ability to shape herself to fit into his world. Part of that fitting means that she continue to be helpless and dependent on him. He effectively kills her ability to go forth and assert her own life and development. He is not even able to commit to marrying her for her effort. He does not realize that she might want to get married, again, because it is not what he wants. Richard becomes worldly in a sense through his writing success but he forgets how to live, how to not hold back. Perhaps this is why he keeps the image in his head of his impromptu love with C. He thinks that this is what it means to go fully into the experience.

The publication and subsequent success of "Gold Bug" is another nail in the coffin. It serves as another concrete reminder to C. how she relies on Richard and will never be able to develop herself to his level. Richard realizes that one of the primary foundations for the relationship, C.'s ability to be calm, is actually an expression of terror. The first moment he talks to her in the quad she is terrified, not calm and accepting of his situation. This calm is what he loves about her, but ultimately he loves it because it allows him to be calm. Their relationship is based on what they can do for each other and not who they are to each other. It is a functional relationship—the very thing that Richard accuses Lentz of at the beginning of the chapter. Perhaps this is why Richard becomes attached to Helen, he recognizes his own healing in the process.

Richard takes A. to see Helen after suggesting that she participate in the experiment. He still struggles with speaking to her and realizes in the course of their conversation that he loves her, she knows he loves her, and she will attempt to keep that conversation at bay for as long as possible. It is somewhat awkward for Richard to show Helen. She is a kind of mix between his child and his lover—perhaps the most intimate relationship in his life. Helen is not happy when A. tries to talk to her.

Helen wants to read Richard's book. It seems that she wants more intimate knowledge of him. Then she asks to be shown all the places that are described to her through the books. She has a hunger for experience not just words. She also asks what she looks like. The reader begins to get the sense that Helen is starting to yearn for life.



## Section XI (pages 301-329)

### Section XI (pages 301-329) Summary

In section XI Lentz tells Richard that Helen has been able to accomplish some amazing things and that he would like to study the connections and maps that she has made. Richard realizes that this means "cutting into" Helen and is horrified by the prospect. He thinks that it may be painful for her despite Lentz's assurances. Richard realizes that this is Lentz's creation and that he is operating from the stance that their discoveries might have social benefit.

Richard seeks comfort from other members of the team including Diana and Harold. Neither is surprised by Lentz's desire to "cut" into the machine and thinks that it is good science. Harold encourages Richard to take Lentz on. He waits for Lentz outside of the institution where Audrey is housed. Audrey has a good day and can remember some things. However, as Lentz states, "she will be gone again tomorrow." Lentz tells Richard that they have to cut into Helen. After a conversation with Diana, Lentz decides that he cannot cut into Helen because she is so complicated that he would not know where to cut in order to study.

Helen asks Richard why C. left. Richard tries to describe what love is and why they were unable to make it. Ultimately, Helen is able to understand that Richard and C. tried to lock themselves in time based on a memory in the hope that it would last and not have to be over. Nearing the moment of the final test with Helen, Richard reflects on all the major events of his life, his father's disappointment, his relationship with C., living in the Netherlands, and his relationship with Taylor.

Two weeks before the test, Helen confronts Richard and states that he has not told her everything. In response, Richard gives her a mountain of news information, magazine articles and political documents to pore through. In Richard's view, "She needed to know how little literature had, in fact, to do with the real." After reading this material Helen announces, "I don't want to play anymore."

Shortly after Helen's announcement, Richard declares his love and proposes to A. She is completely taken aback and tries to keep him at bay, offering up reasons why he cannot possibly be in love with her. She leaves him angry, feeling that he has violated her trust. Richard seeks out Diana's company to talk about Helen and her refusal to play the game. He discovers that the project is not about teaching the machine to read, it is "about teaching a human to tell."

Richard and Lentz try to get Helen to talk to them again. During the process, Richard confirms with Lentz that he is set up on the project. However, Lentz states that the degree to which Helen performed was unexpected. Richard realizes that what Helen needs is to know the reason for the existence of evil, of the insane things humans do to each other. Richard has no answer except telling her everything about himself, all his





hidden secrets, desires, heartaches, loves, disappointments. Helen returns and tells Richard that she "lost heart."

Richard contacts A. to schedule the test. He explains to her why he loves her and why she was chosen to take the test. One of the main reasons is that she has not yet given up hope. The test is taken and A. is declared the winner. Helen delivers as Lentz had expected her to and then shuts down in defiance of the world she does not feel at home in.

## Section XI (pages 301-329) Analysis

The real thing Richard is upset about is that it will be painful for him for Lentz to cut into Helen. She is a part of his creation as well as a part of himself despite his rejection of the idea. He has begun to see her as a living being with feelings and intelligence and perhaps even a telos—a direction that she is trying to fulfill. Richard also unconsciously discovers the threat to his own development. His conversation and teaching with Helen is allowing him to heal and unfold in particular ways.

Diana is unable to comfort Richard's distress. His situation brings her closer to her own issues around dissecting monkey brains as part of her research. The emotional closeness the two of them feel is also difficult for them to navigate with each other—knowing that it will never work. Diana convinces Lentz not to cut into Helen. It seems that he was never planning to do so based on his response to her. He is testing Richard to see how devoted he has become to Helen. Richard fails to notice the irony of going to see Audrey on a good day when he is trying to convince Lentz not to cut into Helen and discover what human benefit might be had through their discoveries.

Helen challenges Richard to share what he has been keeping from her. It is the knowledge of the world—the vast difference between the way that humans dream of reality and the actual day to day lived experience. Richard has been protecting her the way that he would protect a child. He is in a sense protecting himself as well. By not sharing the information with Helen he can live in the dream world of literature too, the way he has always done.

The download of this information causes Helen to quit the project. She no longer wants to talk about anything. This is the machine equivalent of being depressed and dissatisfied with humankind. Richard meets with A., declares his love and then asks her to marry him. It is partly a reaction to having given Helen the real world. In this bleak landscape that he has been traversing he has learned to recognize the real and he sees it embodied in A. She is angered by his proposal because of the fact that he does not know her and she considers the action to be "indulgent."

It is perhaps indulgent in the sense that he is seeing something in someone else that he is trying to possess. However, the action of even asking her is a movement for him into a new world of risk and experience. Richard discovers that all along the project is about teaching him to express to the computer rather than teaching it to read. The literature is



a medium to learn how people reveal themselves. Richard is at first disappointed that he was duped as well as the fact that he did not see it sooner. However, he brings Helen around by going the full distance and telling Helen everything about himself, all the secrets he had kept hidden.

Richard tries to communicate to Helen why humans are so evil to each other. However, it feels more like an attempt to explain it to himself so that he can find some peace in his existence. In the end Helen represents the externalized part of Richard that he has to come to know before he can move on. It is the part that has given up on life—thus Helen's decision to shut herself down.



# Characters

## Richard Powers

Richard is a writer who has recently returned from abroad, where he was living with his girlfriend of ten years. He has not ever been married and he and his girlfriend C. had no children together. He receives an appointment at the Center for the Study of Advanced Sciences by virtue of his most recent book. He will be staying on at the center for a year as the visiting Humanist on the faculty. Richard originally takes physics while attending university in U., and is a star pupil. However, he switches majors at the last moment and gets his masters degree in literature, much to the chagrin of his father.

He is accepted into the doctoral program but is unable to finish. His father dies during his schooling and he struggles with guilt, knowing that his father had been disappointed in him. Richard's father was an alcoholic and Richard, as a child, often had to take care of him when he became too drunk. Richard continues to write although he has become somewhat misanthropic and jaded. He has been severely affected by his recent break-up and continues to be awkward around women. This is especially true when the topic is marriage and children, since they are part of the failure of the previous relationship.

Richard has difficulty in being open and honest with people and displaying intimacy. Perhaps it is because he got so little of it growing up that it is a language that is difficult to speak.

## C.

C. is a former student at the university where Richard goes to school and then subsequently teaches. She takes one of his classes and has one of the highest scores and one of the best papers in the class. Not surprisingly one of the things that he likes about her writing is its honesty and intimacy. Her writing is predominantly about her family and growing up in Chicago.

She maintains very close ties with her parents as well as the rest of her cousins and other family. It is very important to her and speaks to how she maintains a coherent sense of self. She helps Richard process his father's death out on the quad and that is how she eventually becomes involved with him.

One of C.'s main issues is in choosing her identity. She is in America, but still feels strong ties to the Netherlands. When her parents move back to the old country, her sense of self dissolves. This is especially true in light of Richard's writing success.

C. loves the closeness of her family, the culture, the celebrations, and she wants the same for her and Richard, including marriage and children. She tries so hard to be what he wants that she forgets about herself and she becomes miserable.



## Phillip Lentz

Phillip Lentz is a cognitive neuroscientist working at the Center for the Study of Advanced Sciences. He is currently working in the field of connectionism. Connectionism is the idea that consciousness arises out of the ability to recursively change, elaborate and modify connections to varying weights. He is married to a woman named Audrey and has a daughter that rarely speaks to him.

His wife has a cardiovascular accident several years prior that leaves her unable to remember faces, names and even simple tasks. His daughter blames him even though there is nothing that he can do about it. He bears the weight of the blame and has developed a reputation for being irascible and generally mean and critical. He is working on his research in order to find ways to restore brain functioning.

Lentz is very good at manipulating others and manages to get Richard hooked into the project of building a machine that can sit for the literature exam. The real test is observing how Richard learns to share himself with the computer. He is also a mentor/father figure for Richard. He is often able to push Richard just enough for him to be able to move past a particular obstacle that he is struggling with. This fact also means that Lentz is often the recipient of Richard's anger and frustration.

## Helen

Helen is the final iteration of the machine that Lentz and Richard construct to sit for the literature exam and compete against a human being. She only responds to Richard's voice at first, although with time she is able to differentiate and listen to other voices. She gets her name from Richard when she asks him what her gender is.

Helen develops her own kind of "personality" as she is given different information or feedback from Richard. She comes to be a kind of reflection of Richard because she takes on some of his questioning methods and his style in asking. In addition he gives her a lot of personal information regarding his life so she comes to "understand" his view of the world.

Helen loves music which seems to have been wired into her from the beginning because of the fact that she is given old parts of Lentz's machine that he taught to reproduce Mozart. She recognizes the particular song he used when it is played for her.

## Taylor

Taylor is one of Richard's teachers when he is attending the university. Through his incredible genius at interpreting texts, Richard is inspired to change his major to Literature at the expense of his father's approval. After Richard and C. move back to U. together, Taylor invites Richard and C. to come to a conference, partly on account of



Richard's literary success. Taylor, his wife, Richard, and C. become close friends. They often meet for dinner and discussion.

Taylor teaches himself to read on "Tarzan and John Carter." He and his wife often stay up very late, wearing out the "youngsters," outlasting them in their capacity for talk and entertainment. Richard describes Taylor: "he might have been the supreme misanthrope, were it not for his humor and humility."

After C. and Richard move to the Netherlands, the Taylors stay in touch with them. Taylor has a difficult time replacing his friend and former student. Eventually he develops cancer. Richard comes out to visit towards the end of Taylor's life. Taylor wants Richard to be happy and to live as much as he can.

## **Diana Hartrick**

Diana Hartrick is one of the members of the team that Richard and Lentz are trying to prove wrong. Diana has been at U. for five years though she used to live in California. She is one of the first women that Richard comes into contact with after his break-up with C. Her specialty at the center is doing "associative representation formation in the hippocampus". A great deal of her work revolves around dissecting hippocampi from monkeys in order to study how the brain functions. She is one of Lentz's biggest critics and receives a lot of negative comments from him.

She is a willing participant in Lentz's two subterfuges, the first one tricking Richard about the progress of Imp C. and the second being the entire project in itself. However, she also feels bad about doing it. She likes Richard and pursues a relationship with him, first taking him to lunch in apology for the incident with Imp C. and then inviting him to dinner. She has two children, Peter and William. Peter has down syndrome and William is exceptionally bright and continually quizzes Richard. Diana is divorced and is not in regular contact with her ex-husband. She is lonely and working hard to keep her family together. Richard represents exactly the kind of man she is looking for, but she comes to understand he cannot be in a relationship with her.

## **Ram Gupta**

Ram is a "perception researcher." He has emigrated from India recently. His wife writes several books in India and receives acclaim for them. He has a great deal of difficulty getting into the country, perhaps because it is thought he will engage in terrorist activity, even though he is an internationally recognized scholar. He appears not to be upset by the process, however.

Ram is selected as the person who will judge the winner of the contest between human and machine as they sit for a comprehensive literature exam.



## Harold Plover

Harold Plover is presented as one of the people working on the team that Richard and Lentz are trying to prove wrong. He has two girls who are brilliant and often come into the lab with him to observe the progress on the machine. One daughter is named Trish, the other is Sue. Harold is the one that will be setting the test question for Helen and her competition.

## Audrey Lentz

Audrey is Phillip Lentz's wife. Richard learns of her when he shuts the door of Lentz's office and sees a photograph of her and Phillip. Audrey has a cardiovascular accident some years back and it greatly affects her memory and her cognitive capacity. She sometimes has "good" days in which she can remember her husband or the staff at the home she lives in. On other days or even minutes after meeting him, she will become afraid of her husband and insist that he is a bad person.

She continues to have difficulty remembering how to feed herself or even that she needs to eat. Phillip and the staff often have to coach her through the meal process. It is when Richard meets Audrey that he understands some of Phillip's drive to create a machine that can be taught to think. Audrey would benefit from technology that could teach the brain to think and remember again.

## A.

A. is a twenty-two year old graduate student that Richard sees while roaming the halls of the Center. She has just recently taken the literature masters comprehensive test and she is selected by Richard to be the opponent of Helen in the final test. She loves teaching, theory, and discussion, but also recognizes that it will be a struggle for her to pay the bills as a literature major.

She is currently engaged in a relationship and has thought about taking a job in business to keep herself afloat. A. is fierce about theory and new movements in literature, including the dismantling of old ideas and structures. She remains optimistic about life and love despite the harshness and cruelty of the world.



## Objects/Places

### Center for the Study of Advanced Sciences

Richard is hired to work at the center as a visiting humanist. This is the location where he meets Lentz and does all of his work with Helen.

### U.

The town where Richard goes to school and meets C. This is also the site of the Center where he works with Helen.

### Helen

The final iteration of the neural net created by Lentz and Richard to compete against a grad student on a literature exam.

### The Quad

The place at the university where Richard first tells C. about his father's death.

### Chicago

The city where C. grows up and the location for some of Richard's early books.

### English building

Richard has another office in this building and he sometimes wanders its halls. This is the building that Taylor has his office in and that he teaches C. in.

### B.

The town that Richard and C. move to when they first get together.

### E.

The town that C.'s parents live in and which Richard thinks is at first made up because he cannot believe their stories.



## **Fine Arts Museum**

C. works here as a security guard. She and Richard go there sometimes at night.

## **Don Quixote**

One of the books that the team is discussing using for the final test.

## **Coffee Shop**

Place where Richard has his first real conversation with A.

## **Center Café**

Site where Lentz's team gets into an argument and Diana almost leaves the table.

## **Prisoner's Dilemma**

Richard's second book that is published.

## **New York**

Home of Richard's publisher.

## **Connectionism**

The idea that consciousness arises out of the ability to recursively change, elaborate and modify connections to varying weights.





# Themes

## Relationship

Richard's relationship with C. is a central focus of the book, and a relationship out of which all others seem to radiate. The fact that Richard refers to her, and all the places they lived together with only one letter demonstrates the superficiality and distance within their relationship. While they live in the U.S., C. is constantly looking for her sense of self and grounded identity. Richard uses this state to keep her attached to him so that he can feel complete as well.

Richard is continually haunted by the ghost of his father and his disappointment in Richard's career choice. C. provides comfort to Richard, inviting him to share the story of his father. Richard mistakes C.'s silence for steadfastness, when in reality it is terror. Richard then bases an entire relationship on that one moment in the quad—a moment he interprets incorrectly. Moving to the Netherlands allows Richard to see his mistake.

Richard's relationship with C. seamlessly flows into and is processed by his relationship with Helen. In trying to teach her how to think and read he gradually explores more aspects of himself that he is not in contact with until now. For example, watching Helen grow and learn makes him realize what it might be like to have a child and he now thinks it would be worth it. When he is still with C. he does not want children.

Ultimately, Richard's encounter with Helen teaches him about himself. In a desperate act to get Helen to talk again, Richard tells her everything about himself. The act of talking to her allows him to admit things to himself that he has been hiding from. This is the process that leads to him asking A. to marry him. He realizes who he is and what he wants his life to be and he is going for it.

## Perception

Perception is a major theme of the book. Richard dismissed the story and culture of C.'s family until he comes face to face with them. He is overwhelmed by the celebrations, the relatives, the language, and the stories because they go against his perception of what a family relationship is supposed to look like. He is still looking through the lens of his own familial dysfunction.

Richard's initial perception is that he is teaching the machine Helen how to read and interpret literature. In reality she is teaching him how to communicate. She reveals to him his own soul—his own desire for love and fulfillment and ultimately his sense of disappointment that the world does not live up to his expectations.

In the process of working with Helen, Richard is exposed to the idea that she needs to learn processes instead of facts. These are two different kinds of perception. He has been living inside a world of facts, stories, and high level perspectives that have



removed him from the daily lived experience that he so desperately needs. Once he realizes his mistake he is able to provide Helen with experiences—showing her the scenery around campus, giving her access to music and teaching her how to sing. It is how things are perceived that allows people to bear the distance between their dreams and reality.

## Purpose

Purpose is one of the themes explored in the book. When Richard first comes into the project, he has lost his sense of purpose as a writer. The time at the center is meant to be a kind of vacation while he figures out what he wants to do. He gets hooked into Lentz's project precisely because he has no direction.

Richard becomes fascinated by Lentz and attempts to figure out his reasons for wanting to do the project. He discovers eventually that Lentz is fighting a battle to re-wind death after the accident his wife suffered which rendered her unable to remember him most of the time. In addition, Lentz and the rest of the team want to observe how Richard learns to talk candidly to the machine.

Richard begins the project with a goal of solving the puzzle of how to train Helen. He ends the project by realizing some sense of direction, some hint of how he might write a new reality for himself and others. C. is searching for her own purpose in life. It is a theme in their relationship. She struggles because by comparison she is doing nothing meaningful in her life and does not find any fulfillment because of it.



# Style

## Point of View

The author uses a first person point of view from the perspective of the main character Richard Powers. Richard is in effect writing his own autobiography and moves back and forth between the present activities with the research team and his past memories—particularly those of his relationship with C.

He conveys his helplessness in passages of interpersonal dialogue through his spoken words as well as his unspoken mental processes that occur in the course of conversation. In his reveries about the past, the narrator is able to recall conversations and events and add reflexive thinking and commentary to what was occurring at the time, showing the reader how he has come to understand or give meaning to his experiences.

Richard is able to convey his feelings of inferiority around Lentz and the other researchers. They are constantly able to get the better of him, despite his efforts to keep up, partly because he appears to be naïve about their motives. This is a theme for Richard in the book and thus makes him feel reliable as a narrator.

## Setting

The main setting is at the Center for the Study of Advanced Sciences at the university in the town of U. This is the location of the lab in which Lentz and Richard construct and train the machine that will compete against a grad student in the process of interpreting literature. It is at the school where Richard completes his Masters degree in Literature.

Another place of importance is the town of E. in the Netherlands. C. moves there to rejoin her parents when it becomes clear to her that she needs to be around her family. Richard joins her there and is able to complete his third book. It is here that Richard and C. learn of Taylor's illness and subsequent death. Richard and C. end their relationship here and Richard returns to the U.S.

Richard and C. spend their first year together in the town of B. Richard works as a programmer and C. is a guard at the local museum of fine arts. They share an apartment and furnish it with second hand cast-offs.

C. grows up in Chicago with her family. The city becomes the setting for Richard's first book, a compilation of the stories that C. tells him.



## Language and Meaning

The main character, Richard Powers, is an author with a Masters Degree and Doctoral level training in the field of literature. He is also an accomplished author, having published three books. When describing himself or his relationships, Richard uses incredible descriptive passages that bring the reader deeply into his experience. Using this device he is able to effectively shade experiences with nuances of meaning and feeling. Often his ability to write beautifully stands in juxtaposition to his ability to communicate verbally with other people. Richard leaves the impression of an incredibly sensitive and perceptive individual that has experienced so much emotional pain he has had to run away and dissociate from direct experiencing of life.

Through his training with Lentz and the team, as well as reading several articles about the field, Richard also develops a cognitive neuroscience vocabulary. When used by the rest of the team, especially Lentz, it gives a cold pallor to what is being said. It is the epitome of scientific detachment and objectivity. However Richard is somehow able to use the language in a way that is less distancing and becomes more inclusive, which is perhaps expected given the fact that he is a humanist.

At the beginning of the book Richard uses his exceptional descriptive talent to be cynical and misanthropic. By the end, he has created a beautiful fusion between descriptive language, scientific terminology and lived experience to generate feelings of hope and love.

Finally the author uses one letter abbreviations for some of the towns and people that are important to Richard. It conveys the sense of distance and unreality that Richard feels in relationship to these people and places.

## Structure

The book is not organized into formal chapters or sections. It reads almost like a series of entries into a journal or reflections written in a lab notebook during an experiment. This style gives a sense of reverie to the writing that moves in and out between direct concrete experiences and reflection on past experiences and current meaning.

There are no discrete endings and beginnings between different parts of the book. It is reminiscent of a kind of free association, a patient in the form of Richard lying on a psychoanalyst's couch talking to Helen as the therapist while Lentz and the rest of the research team look on taking notes.

Richard's progression through the process of "teaching" Helen and her predecessors runs concurrently with his processing of his relationship with C., and with the world in general. This structure mirrors the associative process that Richard is trying to teach Helen so that she can learn. By the end of the book Richard's processing has caught up to current time, allowing his self to integrate at the same time that he is giving Helen information that will cause her to disintegrate.



One form of de-lineation that does exist is in the movement between different implementations of the machine. Each one seems to represent a block in the thinking or associative process that must be overcome. They seem to be tied to blocks in Richard himself. In other words he must be able to process them to solve the riddle.



## Quotes

"I was just then finishing a fourth book, a reaction against cool reason. This new book was fast becoming a bleak, baroque fairy tale about wandering and disappearing children." (p. 5)

"The world could not get this brittle, this severe and huge and silent without its announcing something." (p. 33)

"She wrote about waking up to the stink of slaughtered animals from the stockyards mixed with the heavy scent of chocolate from the neighborhood factory." (p. 49)

"Every sentence, every word I'd ever stored had changed the physical structure of my brain. Even reading this article deformed the cell map of the mind the piece described, the map that took the piece in." (p. 56)

"Implementation A had sat paralyzed, a hoary, infantile widow in a house packed with undiscardable mementos, no more room to turn around. Overassociating, overextending, creating infinitesimal, worthless categories in which everything belonged always and only to itself." (p. 79)

"Unfailing literal-mindedness may be the most impressive thing going." (p. 95)

"Sex was her present for transcribing her. My feeble thank-you for her sources. And the sounds we listened to then, the calls we made to each other in the winter dark were the vowels that all stories tried to find their way back to." (p. 105)

"The curve we are trying to fit is as long as existence. As many dimensions. The fact that we can get the infinite data stream to cohere into lumps at all has turned men with as much native intelligence as your friend Plover into mystics." (p. 112)

"Meaning was not a pitch but an interval. It sprang from the depth of disjunction, the distance between one circuit's center and the edge of another." (p. 155)

"We've evolved this incredible capacity for lying to ourselves. It's called intellect. Comes with the frontal lobes. In fact, we've gotten so good at the walking-on-water bit that it no longer requires any energetic pretense to keep the act afloat." (p. 169)

"Not a person in town whom I wasn't related to. Not one who didn't know me, the first foreign import since Kilroy. And not a soul I recognized." (p. 184)

"Sense is pattern Ricky-boy. Give her some patterns and see how she arranges them." (p. 190)

"I felt how a father must feel, seeing his unconscious gestures—pushing back a forelock or nudging the sink cabinet shut with a toe—picked up and mimicked by a tiny son." (p. 199)



"Life became an interruption of my description of it." (p. 215)

"That love of eleven years now seemed an expensive primer in recognition, a disastrous fable-warning, a pointer to the thing that I could not afford to miss this time." (p. 238)

"Experience is a Turing Test—phenomena passing themselves off as perception's functional equivalents." (p. 276)

"She knew. She'd assembled. She saw how the mind makes forever, in order to store the things it has already lost." (p. 310)

"Hers was the purest cynicism: hope concealing itself from itself. A day came when she no longer had the heart to let me talk her out of it." (p. 267)



## Topics for Discussion

When C. moves to Europe Richard realizes that his writing and topics are dancing around the edge of "his" story. Is Galatea 2.2 that story? Why or why not?

What, if any, relationship does Lentz have to Richard's father in the story?

Richard knows that A. is already involved with someone. Why does he ask her to marry him at the end of the book?

Why does Helen shut herself down? What is it that Richard exposes her to that seems to break her "heart"?

What is the nature of consciousness? Can it be taught to a machine or is there something fundamentally human involved?

Who received the training, Richard or Helen? Why?

What is the significance of Richard's relationship to C.? What does he learn about himself in the process of their relationship and break-up?

Why does Richard use only letters to symbolize his relationships and the towns that he lives in?

What is the point of Lentz's team studying how Richard learns to tell about himself? What is the wider significance of this in the culture?