Dr. Phil’s Definition of Science Literacy

Science literacy n. An exposure to science in a historical context that serves to allow a person to observe the world around them with understanding, deal with technological applications at home and work, appreciate the distinction between fact and speculation in the media and politics, have a working knowledge of numbers and the scale of the universe, and be able to pursue more information if desired, as a function of everyday life.

Philip Edward Kaldon, Fall 1995

Books as a Source of Information

From all the sources listed in How Will I Get Science Information in the Future?, most are very difficult to evaluate. Dr. Phil can’t easily watch hours of VCR tapes or interview your friends along with every paper he reads to compare your impressions with the actual information being presented. So by narrowing the choices to one medium – books – we can have a little control and consistency between papers.

For more than ten years Dr. Phil has been building up a booklist of suitable books. They are, as you shall see, not just Physics books, but cover all the Natural Sciences, Engineering, Computers, Technology, Medicine and the Morality and Ethics of using these. The total list is kept around a hundred titles. Books come on and off the list from time to time, sometimes because Dr. Phil gets sick of reading too many papers on Airfrang or Jurassic Park, etc., and sometimes because some books work better with some classes (such as PHYS-309) than others.

Because this is not strictly a Physics paper but a Science Literacy paper, the range of books is considerable. There are fiction and non-fiction titles, biographies, science fiction, mysteries and technothrillers – books that straddle the line between science fiction and current reality – from some popular best-selling authors as Tom Clancy and Michael Crichton, covering topics that include Physics, Biology, Chemistry, Engineering, Computers, Mathematics, Technology, Medicine, etc. The list is anything but boring.

It is easiest to pick a book you have not read before. And if you pick a title from the booklist, that’s it. However, you may decide that (a) you have read everything on the list, (b) read everything you think is interesting on the list or (c) waited too long to get the book(s) you were interested in from the library and are now stuck. You may read a book that isn’t on the booklist, but you must get Dr. Phil’s approval beforehand and be prepared to hand in a draft of your paper at least one week before it is due. If you go ahead and write a paper on a book that Dr. Phil has not approved anyway, there is a 100,000 point penalty.

Movies as a Source of Information

It turns out that many of the books on Dr. Phil’s booklist have some connection to a movie or a TV program. Many of these are mentioned in the booklist. If you are tempted to avoid reading a book by watching the movie version – don’t. For one thing, the movies are almost always different than the books. And not only has Dr. Phil read all the books, he has seen all the movies (and owns most of both). So if you just watch the movie, you are going to get caught (and it’s a 90,000 point deduction). Secondly, in most cases, even jaded students like you will usually conclude that the book is usually better than the movie. While there is a lot to say about movies, there isn’t the time to contain all the information content of the book. Movies, at best, hold the flavor of the book.

Having said that, it can be worthwhile to compare what is in the book and movie of a particular combination. Sometimes Dr. Phil uses Book/Movie combinations for his second-semester Physics courses (PHYS-1150 and PHYS-2070 at WMU). You can, however, do this on your own IF you agree to a change in the rules. Having more to evaluate means you have to write a longer paper – it’s only fair. You also have to split your paper between the book and the movie.

Scope of the Paper

A booklist only about Physics topics is likely to be a very short and boring list. While it is true that “Everything is Physics”, there is nothing more pathetic that someone reading a really good medical story and then writing a paper where you try to find the one or two things that seem like PHYS-205 Physics.
and so end up talking about the “Physics of taking someone’s blood pressure”. While the use of a sphygmomanometer is rather fascinating, even Michael Crichton isn’t likely to spend much time to reveal any information about its use in the pages of one of his techno-thrillers.

The Assignment

· Select a book from the “approved booklist” or get approval for a different title from Dr. Phil.
· You should not read a book that you have already read, it only makes the assignment harder. You may find that a book you are already reading for another class may be acceptable.
· Failure to read an approved book is a 100,000 point penalty.
· If you have ever had Dr. Phil before and you read any of the best-seller type books (Crichton, Clancy), you must read a “serious” book for this book report. Failure to comply with this rule will result in an 80,000 point penalty. If you try to submit a report on the same book that you have read for Dr. Phil before, there will be a 100,000 point penalty. This is a science literacy assignment after all, so we want you to learn something new.
· Book titles can be reported in a space provided on the first and second exams. If you don’t have a book title in mind, or you don’t remember it, you can leave the space blank. This is partly so Dr. Phil can see what people are doing and partly to remind you of this assignment. But it is not required.
· Read the book, especially with an eye as to how science is portrayed, what you may have learned that was new to you, whether you believe it to be accurate or whether you feel that the science issues were well explained. Remember that this is an assignment on science and technical literacy, so what you already know (or don’t know) is important.
· Each book in the booklist has a brief description of some points that Dr. Phil came up with. You do not have to agree with Dr. Phil. This is an opinion paper and your opinion matters. Personal anecdotes that tie in with what you have read are appreciated.
· This assignment is not just about Physics. This booklist is about science, engineering, technology, computers and the history, application, ethics, morality, and understanding of it all. So the paper is about this, too. To simply rate the book based on the “Physics” may be to miss the entire point – or in this case, a good chunk of the 100,000 points.
· Write a 4 to 5 page report, typed, double-spaced and a single simple cover sheet, on what you read, paying attention to the assignment. You can write more if you feel it need to, but more will not translate automatically into a higher grade. Good grammar and spelling are expected. Standard Format.
· OR If you want to write a paper comparing and contrasting a book with the movie version of the book, in the context of the assignment, you can expand the page count to 7 to 8 pages. (There is no extra credit for doing this, but sometimes it can be fun to really tear into both movie and book.)
· Dr. Phil is expecting that a “B” paper will satisfy the above requirements. Exceptional papers will be rewarded; problems will be deducted.
· Late papers will drop an additional letter grade (10,000 points) per calendar day, starting after 5pm at the end of the Grace Period.
· Papers are due at the start of class, or can be dropped off in Dr. Phil’s mailbox at the Physics Dept. office by 5pm on the due date listed below.

NOTE: The most popular books, i.e. the ones Dr. Phil has read the most papers on, have been written by Michael Crichton (The Andromeda Strain, Five Patients, The Terminal Man, Congo, Jurassic Park, Airframe and Timeline) and Tom Clancy (The Hunt for Red October and The Sum of All Fears). They wouldn’t be popular (and rich) authors or have their stories turned into hit movies unless their writings were a lot of fun. Now not all of these nine books may be authorized for this particular semester, and no other Crichton or Clancy books will be approved, so don’t bother asking. But despite the fact that they show up in a lot of papers, there is no problem with many people writing their papers on the same book.

Content

This is an Opinion Paper

For many of the papers you may have written in high school or college, they have not wanted you to have or express your own opinions. But this is exactly what we want here – Dr. Phil wants to know what you think, whether you liked the book, etc.

It is All Right to use “I”

Unlike some college papers, it is not necessary to write in a formal style. Since this is an opinion paper, it is okay – even encouraged – to say that “I think that...”.

This is Not a Fourth Grade Book Report

Back when you were a kid, most book reports consisted of “I read Book X. This happened and then this happened and then this happened.” What such a report really ends up being is just a discussion of the plot. The problem with this is three-fold: (1) Dr. Phil has already read your book, so he knows how the plot goes. (2) Writers like Michael Crichton and Stephen Hawking are best-selling authors because they get paid more than you do to write – they’re better at it. Why would Dr. Phil want to read your version of The Andromeda Strain when he can read the book? (3) Just replaying the plot of a novel or a list of topics covered in a non-fiction book or the events in a scientist’s life in a biography does not involve any analyzing of the subject. It is this analysis – thinking about what you just read, thinking about what you already knew and what you have learned – that is the heart and soul of this science literacy assignment.

You Can Be as Serious or as Light as You Choose

Some of the books are more serious in tone than others. Several of the books regard rather controversial topics. You are free to avoid them. One semester a student asked if they could write their paper as if they were writing a letter to someone and talking about their experience. Sure – as a writing technique it’s sort of a crutch, but it got the job done. Others have taken a more humorous tone, or have gotten hostile or offended. Just remember that you should be able to justify your comments. What is Dr. Phil supposed to make of a paper that says the book didn’t do anything for them and it was boring and too technical after Chapter Four, and then in conclusion they said it was a great book and they’d recommend it to anyone?

You Do Not Have to Agree With Dr. Phil

Most of these books are on the list because Dr. Phil likes them and they cover some subject areas that should make for good papers. However, everyone’s experiences and preferences are different. Very few people in the world are Physicists or Physics teachers, and there are certainly very few Dr. Phil’s in this world. So it would be surprising if you responded to every book the same way as Dr. Phil did – especially since a good chunk of the book list was read a long time ago when he was a kid and not a Ph.D. Physicist.

Since Dr. Phil asks for your opinion, you are free to give it. You hate the book. You can hate the assignment. You can decide that you didn’t learn a thing from the book. Fine. Great. Wonderful. Now just write it up. Give examples, be specific. Some of the very best papers in a particular semester have come from the same book where the students reach completely opposite conclusions.

Suggestions

The following are suggestions for ways to start your paper (or start thinking about your paper) if you are stuck.

· Why Did I Choose This Book?

For some, the reason might be as simple as “it was the only book I could find”. If you were a college student in 1903, you would have read a lot of books. In 2005, you can go to college and avoid reading books. So everyone’s experience is different. Just be honest.

· What Did I Know (Or Not Know) Before I Read This Book?

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· What Did I Know (Or Not Know) Before I Read This Book?

When you sit down to read a book, there is a lot of stuff that you bring to the table with you – this includes what you have learned in school, your life experiences, all the other books you have read in your life, many hours of watching TV & movies and what you are interested in doing. These are
some of the things that will affect how you react to a book and these are some of the things that Dr. Phil would like to know about you, in order to understand your responses.

· What Did I Learn (Or Not Learn) From Reading This Book?

Remember, although you might need to discuss a plot point to explain something, your paper is not about what happened in the book, it is how you reacted to what happened. When we watch a play or a movie or read a novel or play a video game, we often engage in “a willing suspension of disbelief” in order to be entertained. Most people don’t really believe in wizards casting magic spells or the plots in James Bond movies or think that there really is a Darth Vader in a black helmet and cape that can use The Dark Side of the Force, or that terrorists set off a nuclear bomb at a Super Bowl game in Denver. But going along with the author is something we do to be entertained. Now, if you don’t buy it, you aren’t going to like it – we need to know this. If you don’t think that we really sent astronauts to the Moon (and some people don’t), then that will affect how you view any book about space travel. See how this ties in with the previous topic?

· Pick 2 or 3 Good Examples

This is a 4 to 5 page paper. You don’t have time to discuss every one of the topics/chapters in Stephen Hawking’s A Brief History of Time – so you can’t. A rule of thumb might be about a page for your introductions, a page each for two or three good examples and a page of conclusions. Provided you follow the assignment – you’ve got your four or five pages.

· Conclusion

You really do have to wrap up your paper. After all, the premise is that books are one way that you might learn something about or improve your science literacy, so did you learn anything? Or did you read something that supported what you already knew? How does this assignment or this book affect your “world view”? Would you recommend this book to your friends? … to other students?

Draft Review (Optional = NOT Required)

If you wish, you may submit a typed, draft copy of your paper at least one week before it is due. Dr. Phil will take a quick read and look for (1) basic mechanical flaws and structural problems in your paper and (2) how your paper fits in with the concept of science literacy and the purpose of the actual assignment. In return, the clock stops while Dr. Phil has your paper – if Dr. Phil has your paper for two days, then you add two days to your due dates, etc. The draft will not be graded and the submission of a draft is not required. If you choose to use this option, you must turn in your draft with your final paper – if you don’t then your final paper won’t be graded. This is to keep Dr. Phil from going nuts “as if experience major deja vu from thinking that I already had made a comment about some aspect”. (Please note that the phrase “rough draft” is never used, which should suggest that the draft be fairly complete as a paper. This is just a free shot before it counts. What could be fairer?!) Please note: If you choose a non-booklist but approved book, you MUST submit a Draft.

Structure – Standard Format

Most of You Will Use Word Processing Software Rather Than Typing

The assignment describes a “typed” paper, but very few of you will actually use a real typewriter. In fact, most of you will use some version of Microsoft Word, on either a Windows PC or a Macintosh.

4 to 5 Pages, Double-Spaced, 1” Margins All Around

The goal here is uniformity of papers for everyone, as well as ease of reading for Dr. Phil.

Left Justified, Ragged Right Margins, Standard Indent for Each New Paragraph

This produces a clean left side of the page and is the easiest to read. Turning to “justify” also lines up the right side of the page, but does so by inserting extra spaces in each line to pad them. This is fine for magazine and book publishing, where they have more control and different rules than you do, but in a paper it makes each line jerky to read and incredibly annoying. Each paragraph should be indented with either a Tab or alternately five spaces. Do not put blank lines between paragraphs – that’s padding.
Again, this is not a formal paper in the sense of many other college papers. It is not required that you footnote, or even give page numbers, for every point that you make or quote (or phrase) you use from the book.

Four to Five Pages
Please make a note that “4 to 5 pages” does NOT mean that 3½ pages is “sufficient”. It is not. Dr. Phil interprets “4 to 5 pages” to mean FOUR FULL PAGES PLUS YOU MAY BE GOING ONTO THE FIFTH PAGE. You can write more than five pages, but there is no automatic reward for doing so. Some people, like Dr. Phil, just write “long”.

Padding Stunts
There are all kinds of “tricks” you could employ to try to make those four pages without writing four pages. But since Dr. Phil has specified the margins, line spacing, fonts, and further suggests that you do not indent new paragraphs by thirty spaces or put one or more blank lines between paragraphs, or start the first page halfway down because you are repeating as a header the information that is already on your cover sheet – these “tricks” to pad your paper won’t work. And endlessly repeating the same phrases or thoughts will be noticed because your paper will be read. And if you want to include a long quote from your book, the proper way to include a long quote of more than two lines on a page is to single-space the quote, so that it is (a) set off, (b) easily showing that it is a quote and not your writing and (c) so that it does not take up an excessive amount of space. Sorry.

It’s the worst phrase in the world for the Y2K6 student, already struggling to get to work and maintain a home life: “And there will be a paper due…”

So Just What Do You Mean By A “College Paper”?!
A college paper is a reflection on you as a student, both in appearance and the quality of the work. It is expected that the writing assignments will be handled in a competent, serious and professional manner. To that end, a college-level paper by Dr. Phil's definition contains the following non-negotiable elements:

- Typed (word processed), double-spaced
- Single, simple cover sheet
- Reasonably clean and proofread grammar
- Good spelling

The Cover Sheet CANNOT Possibly Be Considered To Be Page 1
(If you can’t figure out how to do this, either number your pages by hand, or put the cover sheet at the end of the computer file.)

MANDATORY DEDUCTIONS FOR FAILURE TO COMPLY WITH THESE PERFECTLY REASONABLE RULES.
NOTE: Given that printing and typing are not always carefree processes, if you find that the printer does not line up properly or is otherwise giving you trouble at the last minute, write "Printer Trouble" on the back of the last page and very briefly describe your troubles; this lets Dr. Phil know that you were under duress and wouldn’t normally turn in a bad looking paper. You can then drop off a cleanly printed copy of the paper after the deadline, if one is required. PLEASE! Keep copies of your paper on two floppies.

IF YOU USE A REAL TYPEWRITER, then spell checking and corrections are not automatic. Make sure, however, that you go over typed papers and make minor corrections with a pencil.

IF YOU DON'T CARE ABOUT YOUR PAPER, WHY SHOULD DR. PHIL?

The Seven Statements
If you ask Dr. Phil what he wants in a paper or how to start, this is what he will tell you:
(1) Do not spend the whole paper summarizing the plot (assume Dr. Phil has read the book – he has) and
(2) Do not cheat and just rent the movie instead of reading the book (assume Dr. Phil has seen all the movies – he has – 90,000 point penalty) (see the assignment for restrictions on movie comments),
(3) You might want to explain how you chose this book (sometimes it’s because it was the only one the library still had),
(4) when you sit down to read a book, you always bring something to the table, even if you know nothing about the subject, or have never read any science fiction or whatever – it is this stuff, what you already knew, that is part of what Dr. Phil would like to know about, plus …
(5) what you learned or did not learn from the book. If fiction, you might tell why you believed the author – or did not. If non-fiction, whether the author was understandable.
(6) Give a couple of examples to show me that you read the book, but you won’t be able to talk about everything. Again: DO NOT SUMMARIZE THE BOOK’S PLOT BEYOND 2 SENTENCES!
(7) Any kind of personal story or anecdote or current events that connects with your book is super.

This paper is about PHYSICS, but about SCIENCE LITERACY (Sciences – including Physics, Engineering, Technology, Computers, and the Morality and Ethics Involved in using same).

Due Dates

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<th>Course</th>
<th>Topic 1 – A Science Literacy Book Report</th>
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<tr>
<td>PHYS-2050</td>
<td>Due Thursday 16 June 2006 at 5pm</td>
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<td>Grade Period Ends: Monday 19 June at 5pm</td>
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<tr>
<td>PHYS-1070</td>
<td>Due Thursday 16 June 2006 at 5pm</td>
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The Grace Period Means You Can Turn In Your Paper on Thursday, Friday or Monday, as You Choose. If you submit a Draft Paper to Dr. Phil, you must include the Draft with your Final Paper. NOTE: Watch Out For Exam 3
A Writing Sample

_U-571_ is about an American submarine that is sent out on a mission to infiltrate a wounded German U-boat and take its Enigma machine and codebook. The Enigma is the coding machine that the Germans used to keep their messages secret from the Allies. To not get one was to guarantee failure. Anyway, soon after the boarding crew grabs the machine, the American sub sinks and the Americans are stuck on a wounded U-boat. The movie is about what happens to them as they try to get back to America alive with the machine.

I really liked the movie and even though I don’t know how submarines work, the subs in _U-571_ definitely appeared realistic. The actors looked as though they had been trained in the Navy. It had excitement, adventure and tension. My one gripe is that you never get to know the characters. I mean, you how they act and how they feel at any particular moment, but you never really know them. Even though I didn’t like that, I think that wasn’t as important to the plot when the screenwriters wrote it. I think that what they did want to convey is what makes a captain a captain, because a lot of the movie is the lieutenant’s conflict over whether he would sacrifice a crew member or save the rest of them. Overall, this is an exceptionally good movie.

Chris Molnar, age 12
Sylvan Christian School
The Grand Rapids Press
Friday, 28 April 2000
The Weekend p. 31

So what does a paper for Dr. Phil look like? I've avoided simply copying what an "A" paper looks like, because then I'll just get 25 to 100 papers just like that. But to some extent, it looks a lot like what this young movie reviewer has done regarding the Spring 2000 movie _U-571_. Now obviously this is a lot shorter than your assignment and Mr. Molnar's agenda was very different than yours - he was a kid reviewing a movie for a newspaper. But in a little over half a page, Mr. Molnar has given a brief description of the plot of the story, identified that he doesn't know a lot about submarines but that he felt that what was presented was believable, and that the characters, while not well-rounded, behaved in a believable manner. Now explain how you picked this particular book to read, add a few pages talking about what you know or don't know about the science, engineering or computer technology (or the morality and ethics of using same) in the book you are reading, and then you'll have a Dr. Phil book report. More or less.
Topic 1: The One Page Version (100,000 points)

1. Pick a book from the booklist. If you don’t want to use a book from the booklist, you must get approval from Dr. Phil and turn in a Draft Paper at least a week before the due date. If you had Dr. Phil before, you can’t use the same book and you can’t read a second best-seller, if you read a best-seller the first time.

2. Read the book. This is a Science Literacy assignment, not just Physics. So read the book with an eye toward what you finding about all the sciences, engineering, technology, medicine, and the morality and ethics of using them. Is the author believable? Understandable?

3. Think about what you brought to the table before you read the book – what you know, your experiences.

4. Consider what you learned from the book. Is it new to you? Or is it something you already knew? This is an opinion paper, so what you know and what you think does matter. You do not have to like your book.

5. Write the paper. Do not just tell the plot or story. Dr. Phil has read the book and so have you. Start from there. You might begin by telling why you selected this book. Then pick 2 or 3 things and talk about them in the context of (3) and (4) above.

6. Be careful to make sure you are talking about the book your paper is on. Many of these books have movie versions – Dr. Phil has seen them and knows the differences. He has also read all the books. (You may choose to write a paper about both book and movie, adding in a section about the differences between the two, as well as the assignment, but the page count goes up to 7 to 8 pages.)

7. The paper should be written in English with correct spelling and reasonable grammar. Because it is an opinion paper, you may use the word “I” as in “I think that…” (first-person is acceptable).

8. The paper should be 4 to 5 pages typed (probably on a PC or Mac using a word processor in Fall 2005), double-spaced, with 1” margins all around, a single simple cover sheet, and numbered pages. The cover sheet cannot be page 1, and 4 to 5 pages means that there are at least 4 complete pages of text without extra blank lines at the beginning or end. You may write the page numbers by hand if you wish.

9. Most computer printers and word processors allow you to control the font (lettering) size and style. Acceptable fonts are: Courier/Courier New (12 point), Dark Courier (11 pt). If you have printer problems, contact Dr. Phil. If you typing on a real typewriter, see Dr. Phil.

10. You may, if you want to, turn in a Draft Paper at least one week before it is due, for a free evaluation by Dr. Phil. If you are reading a book not on the booklist and Dr. Phil approves it, you must submit a Draft Paper. In either case, if you turned in a Draft Paper and Dr. Phil marked it up, you must turn in that marked up Draft with your Final Paper, or your Final Paper will not be graded. The number of days that Dr. Phil has your Draft are added to your Due Date, so there is no penalty for writing a Draft.

11. Papers are due on Thursday 15 June 2006 by 5pm. You have a Grace Period that extends until Monday 19 June 2006 at 5pm – that means you can turn in your paper on that Friday or Monday with no penalty. After that, there is a 10,000 point/day penalty.

12. Major penalties: Writing about the movie and not the book – 90,000 points. Writing about a book that was not approved or on the booklist – 100,000 points. Previous Dr. Phil students reading the wrong book – 80,000 or same book – 100,000 points. Writing only about the Physics in a book that isn’t about Physics—or Writing only about the plot of a book with no analysis—the fraction of 100,000 points that the offending section covers. Other minor penalties assessed based on severity/frequency (2000 points ea.)

13. Papers that meet the minimum qualifications are worth at least a “B”. Exceptional papers will be rewarded; problems will be deducted.

Dr. Phil likes most of the papers he gets, but it takes some effort to get everyone to take this assignment seriously.
is a nice local connection, and is married to a physicist. You might ask what the latter has to do with this... is remarkably refreshing to read success stories against a backdrop of odds that seemed guaranteed to create only failure.

The first major sci-fi book I ever read, Crichton's gift as a writer is to blend fact and fiction so that you cannot tell what... and literally invoke "magic" as a solution, which only makes it MORE depressing!

Not to be obsessed with nuclear weapons, but this story is written as if the two authors travel across America several... and how Meitner was treated by the nearly completely male Physics community, but I wouldn't want to put opinions in your head.

This booklist has had some books about Rosalind Franklin, whose X-ray crystallographic work led Watson and Crick... about the movie. I first saw it at Hope College's Knickerbocker Theatre. There is actually a book called A Viewer's Companion To A Brief History Of Time, which Hawking describes as the book about the movie.

I read this one for a high school physics class book report and concluded that this is actually a physics textbook... believed that the movie was made into a movie that was supposed to launch John Glenn into the White House in 1984. Didn't happen. Actually, there is a lot more in the book than is in the movie, but you might want to sneak a peak at the movie if you aren't familiar with some of the gadgets of aircraft flight testing and spaceflight - the movie is mostly pretty accurate. (But don't just review the movie!)

This very popular book about the birth of the Astronaut corps and their transformation by the media into Heroes was made into a movie that was supposed to launch John Glenn into the White House in 1984. Didn't happen. Actually, there is a lot more in the book than is in the movie, but you might want to sneak a peak at the movie if you aren't familiar with some of the gadgets of aircraft flight testing and spaceflight - the movie is mostly pretty accurate. (But don't just review the movie!)

There is probably a good reason why they did not put all its eggs in one basket with a single, large, expensive Hubble Space Telescope - this written before the HST was launched and its nearsightedness was discovered.

I mention it because (a) Rhodes is not a scientist, but like Tracy Kidder mentioned... of how grad students and researchers get treated by each other. Is the Hubble constant for the expansion of the Universe equal to 50 or 100? It's a forty year old feud that takes place in public meetings and in scathing attacks in print.

It is a much more complete history of the accidental discovery of coelacanths living in the 20th century, thought to be extinct for some 70,000,000 years. (Avalon Park come to life?)

This very first science book I read on my own was a little Scholastic Book Service paperback that I had bought for 49 cents on sale and was called Living Fossil. This is a much more complete history of the accidental discovery of coelacanths living in the 20th century, thought to be extinct for some 70,000,000 years.

I have looked at this one for a long time (I was a poor graduate student when this came out, so I didn't buy it at the time), so you should add it to the list if you have not looked at this book.

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There have been plenty of SF books about first contact with an alien race, but this one is nice because we are dealing with the artificats of the alien race and never get to see the aliens (at least not in this book). There’s a lot of good applications of physics and there is a kind of pioneering spirit that permeates the drama. Followed by a series of sequels, some of which are pretty good, but never recapture the innocence of this first one.

Dinosaur extinction may have been caused by a collision with a comet or an asteroid. Recently a 6,000,000 pound rock passed within 50,000 miles of the Earth and astronomers didn’t even know it was there until three days after it past! But what if dropping rocks on the Earth was the predlude to an invasion?

When Prof. Strickland, former chair of the GVSU Physics Dept., first brought this S.F. book to my attention, my first thought was my usual evil thoughts to S.F. book cover artists who don’t have a clue when it comes to science. A mummy in a space suit on the Moon? Come on, it wouldn’t happen. The dead astronaut would either be vacuum freeze-dried or an anaerobic slush of goo in a short time. Ah, but what if the guy in the space suit has been sitting dead on the Moon for 50,000 years before we had a space program? This forensic nightmare has a lot of neat things to think about (okay, so the ending is weak - that’s true of a lot of books - read anything James Michener has written about Centennial). That being said is a paperback version called Giants (?) which includes Inherit the Stars and two sequels. It is not excessively long.

One of the most popular books on the list, Congo is a nice mixture of science, technology and adventure in the deepest darkest and most mysterious parts of Africa. We tend to believe the rhetoric about the global village; in reality, there are vast stretches of the world (and our heritage) of which we know almost nothing. My favorite image is one of how they certify equipment as suitable for fieldwork... Congo was destined for even greater coverage during the 1980’s when the movie version came out. But... I’m told they could have filmed this again, but after Jurassic Park, they can do nothing today -- except write a decent script. As for the movie, Michael Clrotch is not involved in this production, unlike many of his others. Look for considerable shifting of the characters, probably to modernize and make more politically correct. As a result, the movie is lame, read the book.

Nothing worth doing once isn’t worth doing twice, according to the popular culture gurus who have created the National Information Superhighway is coming. Internet is already here... some of the stuff that computer science people have been batting around with Artificial Intelligence (A.I.) for years.

In 1968, the year 2001 seemed so very far away. We were about to send Men To the Moon and American companies like Pan Am seemed invincible in the world market. Clarke wrote and rewrote this story over time (other versions were Starkley and Captain Starkley of 2001 / Arthur C. Clarke). The publisher was Douglas Trumbull and others, who eventually ended up forming Industrial Light and Magic to do special effects for Star Wars and every other big budget movie of the ’70s, ’80s and ’90s, cut their teeth on this one. Still, the movie is no fast paced thriller - it is almost the first cerebral action movie. The book ended up being published before the movie was done, so the story is very different. But all the main characters are there: the early man-apes, the Monoid, our intrepid astronauts, and, of course, HAL, the computer. (Change each letter in HAL’s name to the next in the alphabet to get the joke.) People who fell asleep in the movie find the book exciting, which is a good thing considering that this is a book report not a movie review.

Nothing worth doing once isn’t worth doing twice, according to the popular culture gurus who have created Sequelmania. Years after Clarke had finished 2001, he got the bug to go back and expand the story and to try bring the science up to date. The result is 2010 and it’s a pretty good story – almost a violation of “Dr. Phil’s Rule of Sequelmania. The movie is also excellent, starring Roy Scheider (now seen as the Captain of the SeaQuest) and offering those immortal heeded Russian aghorisms: “Easy as cake” and “It’s a piece of pie”, but once again, the movie and the book are different and (trust me on this one) Dr. Phil knows the difference.

The 1980’s saw us watching the ever-resourceful McGuyver and his trusty Swiss Army Knife, think and work his way out of any scrape. But a hundred years earlier, fiction adventure books abounded where the hero(s) managed to survive and bring civilization on whatever deserted island that happened to be shipwrecked on. In this, our intrepid heroes are Union supporters who manage to escape certain death at the hands of the Confederates by use of a stolen balloon, only to be swept away in a violent storm and balloon-wrecked on a remote volcanic island, who knows where. The “mysteries” of The Mysterious Island abound: where are they? How will they ever get home? And what unseen force is helping them survive? I first read this when I was 9, and I think that it strongly influenced my interests in dabbling in all manner of sciences, engineering and technology. I doubt that I would do as well as these hearty souls, but then they really did have a lot of help and a 19th century upbringing and no dependence on computer technology. The big difference between unabridged and abridged versions of the book, as noted in From the Earth to the Moon, is much longer inventories and descriptions of things in the latter.

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A giant epic saga of the NASA and the American space effort to land Men on the Moon, told as only James Michener can do. Actually, like so many Michener books, it starts so well and covers so much, that you wonder why the storyline and the ending seem so, well, anemic. I maintain that Michener can’t deal with today, only yesterday, and that therefore he can’t write endings to his books.

The 1980’s saw us watching the ever-resourceful McGuyver and his trusty Swiss Army Knife, think and work his way out of any scrape. But a hundred years earlier, fiction adventure books abounded where the hero(s) managed to survive and bring civilization on whatever deserted island that happened to be shipwrecked on. In this, our intrepid heroes are Union supporters who manage to escape certain death at the hands of the Confederates by use of a stolen balloon, only to be swept away in a violent storm and balloon-wrecked on a remote volcanic island, who knows where. The “mysteries” of The Mysterious Island abound: where are they? How will they ever get home? And what unseen force is helping them survive? I first read this when I was 9, and I think that it strongly influenced my interests in dabbling in all manner of sciences, engineering and technology. I doubt that I would do as well as these hearty souls, but then they really did have a lot of help and a 19th century upbringing and no dependence on computer technology. The big difference between unabridged and abridged versions of the book, as noted in From the Earth to the Moon, is much longer inventories and descriptions of things in the latter.

Ender’s Game / Orson Scott Card

Ender Wiggins is a young boy sent into space to train to fight an alien race that might return and attack Earth again. In between some very interesting physics applications, Ender is subjected to the most unusual training and an secret agenda of his teachers. Card has a good track record writing science fiction about children and unusual coming-of-age stories. His Songmaster is a beautiful story of music and galactic politics, of all things. “Ender’s Game” is another perfectly wonderful science fiction book that has spawned a series of sequels, which are okay, but fail to capture the flavor of the first. I have debated putting this on the list for a long time, but recently a student suggested that I put this on the book list instead of the book he read which he hated.

Congo / Michael Clrotch

One of the most popular books on the list, Congo is a nice mixture of science, technology and adventure in the deepest darkest part of Africa. We tend to believe the rhetoric about the global village; in reality, there are vast stretches of the world (and our heritage) of which we know almost nothing. My favorite image is one of how they certify equipment as suitable for fieldwork... Congo was destined for even greater coverage during the 1980’s when the movie version came out. But... I’m told they could have filmed this again, but after Jurassic Park, they can do nothing today -- except write a decent script. As for the movie, Michael Clrotch is not involved in this production, unlike many of his others. Look for considerable shifting of the characters, probably to modernize and make more politically correct. As a result, the movie is lame, read the book.

Fall Safe / Eugene Burdick and Harvey Wheeler (1962?)

The Cold War, the threat of nuclear extermination was something tangible and real. And books like Fail Safe and On the Beach were both terrifying nightmares that made people stop and think about what they were doing. It would be another twenty years before Nuclear Free Zones started showing up, during which NORAD would tunnel into Cheyenne Mountain in Colorado and the numbers of nuclear missiles and weapons would increase probably by a factor of ten.

Timeline / Michael Clrotch (1999)

Time travel stories are always problematic – there is no good scientific basis for supposing that time travel will ever be achievable, but it makes for good stories. Clrotch has once again turned his talent at technological fiction to quantum physics and time travel. And also to the technologies of 14th century France. You’ll probably learn more about the past than the future in this novel, but then you never know.

The Hunt for Red October / Tom Clancy

Clancy is well-known as the writer of modern, fast-paced, techno-thrillers that seem to know far too much about the workings of classified Defense Department equipment and the inner workings of the CIA and the intelligence committee. There is a lot of science and engineering detailed in these two books - a good read to take some of the mystery out of the computer and to get an idea of how that secret stuff works. The Hunt for Red October involves a boat that is based on the Soviet super sub; the United States is trying to help them defect while the USSR is trying to sink them. The movie, although entertaining, is much shallower than the novel, as is typical. The Sum of All Fears brings terrorist bombing to a new level in a story that people all across the globe would like to see. Some people fall in love at the end of the book, but a certain amount of it can be skimmed or skipped if you want to get back to the story. Jack Ryan, who has been played in the movies by Alec Baldwin and Harrison Ford, is the main character in both stories.
Time travel has fascinated science fiction writers for a long time. Imagine going back and see what really happened. The Hardy Boys and the Microkids (the people in this book) are today. Time and Again / Jack Finney

Grass is a planet whose ecology is based on, well, grass. Hundreds of different kinds, colors, textures, flavors, etc. And the human colony also deals with the natives in an attitude of authority, and that was reflected in the book. Tom West, who has been equipped with AK-47 automatic rifles. Again, it all sounds crazy. But... if you really want to understand technology and how it impacts on our lives, sometimes it is important to take that technology and either remove it entirely (hmm, there's a real book that seems to be missing from this version of the book list) or place it in a different context. That's a real value of SF writing. This book is the beginning of a massive series that is now four books long and I don't really think it's done yet.

The Difference Engine / William Gibson and Bruce Sterling

I spent the summer of 1994 reading maybe eight or nine cyberpunk novels, a genre of science fiction that deals with computers and the way society will change with the use of computing power. Gibson and Sterling's creations do all that and more. This book is very accurately Victorian, which means that it is written in a crowded gingerbread style that seems quite alien until you get used to it and it is in no way politically correct. Reader discretion is advised.

Neuromancer / William Gibson

I,II,III,IV,VI,VII,VIII,X

What started out as just a study of how computers are used in the workplace, turns into a fascinating and somewhat depressing account of how big business and government misuse computers to create the modern electronic equivalent of the sweat shop. Very insightful to see how McDonald's, social services, airline reservation systems are used. The Amazon.com/free systems really work. Everyone talks about the convenience of computers. Great savings (sounds like all those bad AT&T and MCI commercials) to do the job by computer, but in reality computers can be very difficult for users to understand.

The Soul of a New Machine / Tracy Kidder

Another New York Times bestseller, Kidder is just a good writer who talks along with a crowd of computer designers at Data General in the early 80's and watches them create a new minicomputer. The tension is palpable and the company's social structure is vividly described. As with Andromeda Strain, Disclosure and other Crichton stories, he has artificially collapsed the timeline so that there doesn't have quite the innocence of the first book, but it is really enjoyable and has some really excellent twists in its plotline. I wouldn't recommend that you read the second without reading the first. Rumor has it that Time and Again may be made into a movie; something that couldn't have been done well with movie making technology even just a few years ago.
The title refers to Steven Jobs' cheerleading term for the vision that became the Apple Macintosh computer. This book about the history of the Macintosh was written by a rabid Macaholic, so there are plenty of not-so-objective statements about how wonderful the Mac and how awful everything else is, and he clearly doesn't always know what he is talking about. Still, given the success of both the Macintosh and Microsoft Windows, it is very interesting to see where all this stuff comes from and how our ideas of what a computer is or should be. I really wonder about the people over at Xerox, who never expand the tremendous stuff that was developed at their very own Palo Alto Research Center (Xerox PARC). (And in the 1940's, IBM once estimated that they could only envision a worldwide market for maybe ten computers.)
were required by or the result of, new foods. Most of us live in such isolation from where our food comes from, that

A real stretch here, but there's still a lot of science in both food preparation, and the technological changes which

Taboos / Margaret Visser

Much Depends on Dinner: The Extraordinary History and Mythology, Allure and Obsessions, Perils and

Technology is not a new invention of the 1990’s; a great deal of engineering design work was done long before

There are thousand year old structures that are still standing today while some pretty expensive modern real estate


This is Modern Physics explained for both scientists and non-scientists.

My wife ran across this book and enjoyed it so much she passed it on to her old Astronomy professor from college.

Disasters are such an instructive way to talk about technology and our society and media react to it, that's sometimes have library assignments and papers on the topic. No science is particularly good or evil. Furthermore, no matter how hard we try, accidents can and will happen. And when we become complacent, as humans are wont to do as long as things are working just fine, we don't try as hard. Providing a balanced view of the pros and cons of the atomic age - this ain't it. Dr. Caldicott became incensed with the numbers and horrors of atomic weapons and gave up a rewarding medical practice in order to combat them. Still, there are many good arguments and discussions in this critical look at the real and projected costs of the arms race and questionable arguments that have supported it. For example, during the Missile Gap crisis in the early 1960’s, the Soviets actually only had four working missiles. (The CIA was really embarrassed when they found this out!)

• Technology and Engineering: The Beaches Are Moving: The Drowning of America's Shoreline / Wallace Kaufman

A nice book that tries to explain that shoreline and property lines just don't mix, while we keep on assuming that Mother Nature will respect our manmade boundaries. Or the mistaken belief that putting up one breakwater won't have any effect and change the erosion pattern elsewhere.

• Technology and Engineering: Rubbish! The Archaeology of Garbage / William Rathje and Cullan Murphy

This book serves as a useful reminder that we are what we eat. Forty years ago, most of what we buy in the stores today as packaged or prepared foods did not exist, and most people had at least a good idea of where food came from, even if they didn’t know the history of it. This has been a surprisingly popular book for this assignment.

• Technology and Engineering: The Beaches Are Moving: The Drowning of America's Shoreline / Wallace Kaufman

If you have any interest in recycling, the environment - or the other side of the coin, with the production and distribution of consumer goods, this book will open your eyes to what happens after stuff is thrown out. Why aren't our landfills stuffed with sofas and major appliances? (They are shipped and sold to the developing countries, who need them more than they worry about brand names or newness. - In other words, they are REALLY recycled.)

Dr. Phil has been using computers since 1976, had e-mail since 1984, and remembers ARPANET and BITNET, long before there was this thing called the Internet. The exploration of the Internet and the Web has been touted as being unique in the history of man and technology. But is it? Right from the start, Standage's argument really hits a chord, as one considers how the telegraph changed everything seemingly overnight in the nineteenth century.


Promontory Point, Utah, May 10, 1869. A time and place that both defined a moment in history and changed the United States of America forever. The event was the laying of the Golden Spike to complete the joining of the Union Pacific Railroad from the Midwest with the Central Pacific Railroad from California. Reliable, fast communication and transportation from Atlantic to Pacific was now a reality. But how did such a project get started in the middle of the Civil War? We so often think that everything was at a standstill during the great war, but that isn't exactly true. Nothing Like It in The World is a story of policies, history, and a spectacular construction project—one of the great engineering feats of the 19th Century. Historian Ambrose is most recently noted for his work on WW II and the construction of the Canadian Pacific Railroad, which is Canada's transcontinental railroad story. Thankfully, in my lifetime, I have the pleasure of reading a similar epic about the American transcontinental railroad.

Medical see...
The Road to Wellsville / T. Coraghessan Boyle (1993)

This is one odd book. It is hard to decide whether it is comedy or history, real or fiction. In the end, it is a fascinating look into a piece of Michigan's past, at the great Dr. Kellogg, the Battle Creek Sanitarium, breakfast cereal, and the whole Victorian upper class obsession with excess. There is a movie, but there's so much more to the story in the book. You'll never look at another diet plan or special food in the same way again. Science? Dear sir or madam, this is all in the name of Science!

The Body Farm / Patricia Cornwell (1994)

or - - - - - - Deja Dead / Kathy Reichs (1997)

"You are about to enter the fascinating world of forensic medicine." Thus began every episode of the TV show Quincy. In fact this is a rather fascinating world, and millions of mystery readers enjoy the hunt for clues and details as much from the forensic investigators as the police and detectives. Here are two science literacy tours from the dark, convoluted world of murder and mystery.


For all the stories about the bubonic plague (Black Death) of the Middle Ages or AIDS and Ebola today, the most deadly world pandemic occurred at the end of WW I, the 1918 Influenza Epidemic. Now everybody has gotten the flu. But your grandparents or great-grandparents probably never told you or your parents about the 1918 flu. Fear of the 1918 flu returning helped drive the Swine Flu Vaccine fiasco of 1976. Dr. Phil was a college freshman then, but because college campuses are a hotbed of diseases, I went ahead and got my shot, even though the shot itself was by then considered dangerous.


I heard Laurie Garrett talking about her new book on NPR in the Fall of 2000 and rushed out to buy it. Garrett is the author of The Coming Plague, listed above, and as a reporter for Newsday, she has circled the globe covering stories like Ebola, AIDS, etc. What struck me was her comments, which I had never really thought about before, that public health is not only not the same as medicine, but that the two might be considered to be opposites - maybe even enemies in the battle for funding and money. She makes an excellent case for the sorts of problems that exist now and will blow up in our faces in the near future because of our failure to think in terms of global health. Lots of talk of the need to both feed the world for people dying of dread diseases in foreign lands like Africa and feel safe that such things will not affect us here at home in America. Be afraid... be very afraid...

The Human Genome Project has been described as the biological equivalent of the Manhattan Project in physics. Now for a lot of reasons, Dr. Phil doesn't believe that, but mapping out the entire genome of the human species has great promise for the treatment and prevention of disease - or it could hold the seeds of our destruction. Ridley, in part, tries to defuse the hype by pointing out that the HGP is not revealing the entire human genome, but rather noting some of the averages of the common man (whatever anyone chooses that to mean). His example is one of blood type - which blood type will be the one included in the sample? However, there is no denying the scope of undertaking: 10,000 years worth of DNA strands that various traits are controlled. And in the Year 2000, two scientists at different institutions stumped the science world by declaring the human genome "decoded", complete, in a time far shorter than originally forcast for the work. These two men even made A&E/Biography's Biography of the Year. So chapter by chapter, Ridley talks in broad views of what is known about our own genetics and the sorts of puzzles, surprises and sheer scope that is included.

A Thread Across the Victorian Internet: the Heirric Story of the Transatlantic Cable / John Steele Gordon (2002)

A nice companion to The Victorian Internet earlier on the list, the laying of the transatlantic cable connecting the New World with the Old World in the 19th century was the "Victorian equivalent of the Apollo project." Consider that before the cable was laid, the minimum communications time between the young United States and Europe was measured in days or weeks. No way would American dollars get invested in the European stock markets with that kind of lag, nor would European goods be exported to American projects. Again, it's a matter of perspective and paradigm shift - today it's wireless technology, and a general thinking that "this is totally new" / "we've never been here before". But realistically, that's not true. And technical historians can still illumine our present with the past.

Tuxedo Park: A Wall Street Tycoon and the Secret Palace of Science That Changed the Course of World War II / James D. Conant (2002)

Alfred Lee Loomis is not a household name today, but James B. Conant is at least visible in the history of science in the 20th century. President of Harvard and advisor to U.S. Presidents on science matters, Conant was a friend of Loomis and the author's grandfather. Today there is sometimes a strained relationship between academic & government science worlds and the corporate science world. And there is definitely a question in the post-Enron era of how much public good rich tycoons do our society. Loomis' story comes together quite the American success story with a strong personal interest in science - and the will to put his money where his mouth was. This book makes a case that it was the support from Tuxedo Park that helped science win World War II, not just the big money government efforts like the Manhattan Project. Wonder if anyone has sent this book to Chairman BW? (grin)
Don't bother asking to read other Tom Clancy's or Michael Crichton's Disclosure, Sphere, Jurassic Park or Lost World (Jurassic Park 2). Dr. Phil will say "No".

This Version of the List Contains 107 (or so) Titles Many of Which Are Listed In The Computer Catalogs At Area College and University Libraries (The Library Codes are Out-of-Date). Maybe, Just Maybe, You Might Want to Keep This Handy Book List for Future Reference?

All Books Have Been Carefully Chosen So If You Don't See Any Science In A Particular Book Rather Than Saying "I Don't See Any Science" Why Not Ask Yourself: "Why Do You Think That Dr. Phil Put the Book On The List?" Be Sure You Read The Assignment Sheet Carefully Before You Write Your Paper. See the Following Pages for More Information About the Format for Papers!

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PLEASE! I Know That This Takes Time – I Know That Fitting In A Paper Is Hard Work I Know That Printers Don't and Word Processors Mangle, So Store Your Work on TWO Floppy Disks, If You Use a Computer and If You Use A "Real Typewriter" Rather Than a Computer, I Understand Your Problems So Don't Use Your Paper As An Excuse To Cut Class That's What the Grace Period is For – To Have Time to Fix The Glitch

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We Want You HERE To Participate (And Get Your Work Done On Time, Too.)

New – An attempt to code the titles as an aid to keep you from making a bad mistake.

<table>
<thead>
<tr>
<th>I. – Best-Seller</th>
<th>Many books are popular in their field, but a best-seller is defined as one that appeals to a much wider audience. Should be readable.</th>
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<tbody>
<tr>
<td>II. – Fact</td>
<td>This book is based on Fact.</td>
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<tr>
<td>III. – Fiction</td>
<td>Fiction is made-up. All Novels are fiction. Occasionally a book is based so much on a real incident, that I’ve coded at least one book as both Fact &amp; Fiction.</td>
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<td>IV. – History/Biography/Reminisce</td>
<td>The material in this book is based on actual events, which you could look up elsewhere, or use as a reference to some extent.</td>
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<tr>
<td>V. – Technology</td>
<td>The technology of 1999 is the technology of the 20th Century. This includes more than just the latest Intel Pentium III, chips at 650 MHz, but all sorts of stuff invented since the 20's and 30's. Understanding our technology is a major cornerstone in what Dr. Phil calls Science Literacy.</td>
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<tr>
<td>VI. – Non-1999 Technology</td>
<td>Most of us would not survive very well outside the 20th Century technological base. Studying the technologies of the Victorian or Edwardian engineers (19th &amp; earliest 20th Century), or of metal work in the year 1000, or how one gets food to the table in a world without Saran Wrap™, microwaves or McNuggets™ is one window on today. A few books that study possible future technologies are also labeled with this code.</td>
</tr>
<tr>
<td>VII. – Fantasy/Alternate Worlds</td>
<td>Some people argue that all Science Fiction is just somebody’s fantasy, but technically Fantasy applies to stories that exist outside the realm of science – nearly anything with Magic, for example. Magic is often written in such a way that it becomes a science or a technology to its users in fantasy, and this is a good way to learn to study how and why we know science. I’ve also included in this code, some books which have chosen to rewrite what history we know, again as a way to evaluate where we are today. These are What if…? books.</td>
</tr>
<tr>
<td>VIII. – Difficult to Evaluate</td>
<td>These books are minefields in some way. You can write a really lousy paper by not getting the point of the book and many people have. Most book reports on The Diamond Throne, a fantasy book, or Dune, an SF book, concentrate on the politics. Now if you are going to talk about the politics in relation to Science Literacy, you’re going to have to be really good. Otherwise, its best to stick the mantra for this paper: Science, Engineering, Technology, Computers, Math and the Morality and Ethics of Using Same.</td>
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<tr>
<td>IX. – “Nutrient Dense”</td>
<td>Fancy way of saying long, hard book.</td>
</tr>
<tr>
<td>X. – Advisory for the Faint of Heart</td>
<td>Contains one or more of the following: adult situations, controversial materials or descriptions that are hard to handle. You have been warned!</td>
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