**Purpose**

**Science Classes**
As a student, you have received science and science related information from your teachers. Whether you believe it or not is up to you. But a professional has taken the time to determine what sorts of things are important to know and with how much detail, both for the purposes of the courses you are taking and for the more general purpose of “Science Literacy”, to help make you a better citizen and better able to function in our science & technology driven 21st Century.

**How Will I Get Science Information in the Future?**
For some of you, your courses at Western Michigan University may be the last time you will have the benefit of someone directing what science you are exposed to. So, what happens when you get to the “real world”? Well, you may be bombarded with information from all sorts of sources: your job, newspapers, magazines, books, television, radio, movies, the Internet, friends, conversations overhead while standing in line somewhere – you name it. What these methods may lack, though, is the control and expertise of your teachers. You can find all sorts of amazing information on the Internet, but you would have to be very naive to believe 100% of everything you read there. Much of our news is dominated by politics, but how much science do our politicians know? At the moment, we have exactly one professional engineer and one physicist in the House of Representatives (both of these men are from Michigan – you should know who they are, but probably don’t), none in the Senate. Most of Congress is made up of lawyers. While there is nothing wrong with studying the Law per se, legal arguments do not follow the same rules and purposes of scientific arguments. Therefore there is nothing that requires an environmental cleanup bill, for example, to have anything to do with either the environment or cleaning it up. Likewise, the thinking heads we get our news from on TV are not trained in science and technology for the most part. I don’t know what Dan Rather or Connie Chung majored in at college, but I can probably bet it wasn’t Physics. They may have, unlike you, been able to graduate from college without ever having had a Physics course. Even on the cable channels, one of the hosts of a computer show I used to watch is now doing a cable show on gardening – figure.

So how will you evaluate information on your own? This is possibly something that you have never thought about, but Dr. Phil and other professionals have. Dr. Phil’s approach is to have you read a book and examine what you read and how it affects you, as well as whether you believe it. (You don’t have to.)

**Learning to “Parse” Information**
Evaluating what you read in this context is very much in line with definition 3 of the verb parse:

**parse** (pars) verb, transitive
1. To break (a sentence) down into its component parts of speech with an explanation of the form, function, and syntactical relationship of each part.
2. To describe (a word) by stating its part of speech, form, and syntactical relationships in a sentence.
3. To examine closely or subject to detailed analysis, especially by breaking up into components: “What are we missing by parsing the behavior of chimpanzees into the conventional categories recognized largely from our own behavior?” (Stephen Jay Gould).
4. Computer Science. To analyze or separate (input, for example) into more easily processed components. Used of software.

verb, intransitive
To admit of being parsed: sentences that do not parse easily.

*Source: Microsoft Bookshelf ’95 (American Heritage Dictionary of the English Language (Third Edition))*

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**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 booklet 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 Airframing 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 booklet, 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 booklet, 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 booklet have some connection to a movie or a TV program. Many of these are mentioned in the booklet. 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. Currently Dr. Phil is using Book/Movie combinations for his second-semester Physics courses (PHYS-115 and PHYS-207 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 booklet 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 technothrillers.

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. 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 you need to, but more will not translate automatically into a higher grade. Good grammar and spelling are expected.
- 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 3pm on the due dates 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 2004, 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?
  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 I 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

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.

Readable Font (Examples on Next Page)
If your printer/word processor cannot handle these, talk with Dr. Phil. These fonts and sizes have been selected so that the amount of typing in the average paper doesn’t differ by more than about ±10%, however you are allowed a choice so that it looks good to you.

Times New Roman 10 point font is a very readable font.
Times New Roman 11 point font is a very readable font.
Times New Roman 12 point font is a very readable font.
Century Schoolbook 10 point font is a very readable font.

NOT: Handout may be reduced in size. Fonts will not display on the web page.

Spelling
Nearly all word processors contain some sort of Spell Checker. Use it. But you must know that computers, like calculators, are basically stupid machines. A spell checker cannot tell the difference between two, to, too or These – all of which are pronounced the same. Word choice in English is very specific. Misspellings, especially of the author’s name (or Dr. Phil’s name), looks sloppy, as if the paper was written at the last minute and/or without any care.

Grammar
Reasonable grammar is expected in a college paper. This requirement is loosened slightly in some papers, because some students are not native English speakers and some papers may be written in a casual, often first-person style. However, your paper is supposed to be read – if your meaning isn’t clear or your sentences don’t make sense, your paper’s grade will suffer. Microsoft Word and other modern word processors may have a Grammar Checker feature, but unlike a Spell Checker, Grammar Checkers do not work very well and often find some sorts of errors. They work best with certain types of documents, such as company memos, in order to give all company documents that same “feel”. Your best bet is to proofread your paper for readability. But even among good writers, it can be very hard to proofread your own work. So you can (1) get a friend to read over your paper and see if they understand it or (2) go to the Academic Skills Center and have someone there go over your paper with you.

Additional Information
Sometimes students go beyond the book, by looking up topics in the dictionary or encyclopedia, or going to the Web and searching the Internet. This is NOT required. But some students get enthusiastic about what they have read and want to know more. So you may use additional sources, but don’t use them as ways to pad your page count and cut down on how much you have to write. Additional sources and additional information go on additional pages.

No Need For Footnotes
Again, this is not a formal paper in the sense of many other college papers. It is not required that you use additional sources, but don’t use them as ways to pad your page count and cut down on how much you have to write. Additional sources and additional information go on additional pages.

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.

Dr. Phil has in the past received papers with 3” top and bottom margins and 2” side margins. This leaves a typing area of only 4 1/2” by 5”, coupled with a 14 point or 16 point font, and even a four page paper under these printing conditions contains almost no text. Hardly seems fair to everyone else.

It’s the worst phrase in the world for the Y2K4 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
- Margins: 1” all around
- Page numbers (by hand is acceptable)
- Single, simple cover sheet
- Readable standard font/typeface
- Good spelling
- Reasonably clean and proofread grammar
- Stapled in upper left-hand corner
- SINGLE-SIDED ONLY!

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 floppy disks.

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 it is that 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 not 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>PHYS-205</th>
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<tr>
<td>Topic 1 – A Science Literacy Book Report</td>
<td>Topic 1 – A Science Literacy Book Report</td>
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<tr>
<td>Due Thursday 25 March at 5pm</td>
<td>Due Thursday 25 March at 5pm</td>
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<tr>
<td>Grade Period Ends: Monday 29 Mar. at 5pm</td>
<td>Grade Period Ends: Monday 29 Mar. 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 submitted 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

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**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, computers, 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 retell 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 Spring 2004), 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: Times New Roman (10, 11 or 12 point), Courier (10 point), Arial/Helvetica (10 or 11 point) or Century Schoolbook (10 point). These produce text all within ±10% of each other. 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 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.

11. Papers are due on Thursday 25 March 2004 by 5pm. You have a Grace Period that extends until Monday 29 March 2004 at 5pm – that means you can turn in your paper on that Thursday, 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 analyses—the fraction of 100,000 points that the offending section covers. Other minor penalties assessed based on severity/frequency (2000 points each.)

13. Papers that meet the minimum qualifications are worth at least a “B”. Exceptional papers will be rewarded; problems will be deducted.
Watson's Double Helix has been the classic of a generation; Crick's What Mad Pursuit puts a lid on some of Jim's exuberant self-aggrandizement. One of Watson's creations is a character named Rosalind, the personification of the embittered old maid of science – who just happened to do the X-ray diffraction work crucial to W&C's Nobel Prize in 1962. Rosalind's acceptance of the Nobel without her knowledge. The problem is that "Rosalind" didn't exist, and this author wants to try to set the facts straight. (The Nobel Prize committee does not award prizes posthumously, which is why you didn't know.)

H W K L V R The Making of the Atomic Bomb / Richard Rhodes (1986 pages) IL,IV,IX Probably too long for this class, I mention it because (a) Rhodes is not a scientist, but Nacy Tracy Kidder mentioned below, he is simply just a very good writer, and (b) this is absolutely the most complete history of the Manhattan Project that you'll find in an unclassified library. No matter your feelings on the ethics of the result, the science and events that led up to the Bomb and the incredible grouping of scientific minds in one place that did, it is one of the 20th century's great stories. To me, the best part is that he not only explains what is going on, but weaves a story that you understand what the scientists did and did not know and the whole politics of the Manhattan Project.


L W V Lonely Hearts of the Cosmos / Dennis Overbye II,IV, V A look into both the people and astrophysics in the search for the origins of the universe, and also a very human tale 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 107. It's a forty year old fact that takes place in public meetings and in scatting attacks in print.

H W K L V R A Brief History of Time: From the Big Bang to Black Holes / Stephen W. Hawking. IL,IV

Probably the first physics book to stay on The New York Times best-seller list for months. Very readable treatment of modern cosmology. They made a documentary movie called A Brief History of Time; probably the first physics movies to ever run in real theaters. I first saw it at Hope College's Knickerbocker Theatre. There is actually a TV series called & Viewer Company To A Brief History Of Time, which Hawking describes as the book about the movie about the book.

H W K L V R Infinite in All Directions / Freeman J. Dyson II,IV, V

Dyson is a very interesting human being, besides being someone not enough people ever listen to. One of the essays comments on how NASA shouldn't 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.

H - - - - - - Living Fossil: The Story of the Coelacanth / Keith S. Thomson II,IV, V

The very first science book that I had on my own was a little Scholastic Book Service paperback that I had bought for 49 cents (or so called Search for the Living Fossil. This is a much more complete history of the accidental discovery coelacanths living in the 20th century, thought to be extinct for some 70,000,000 years. (Jurassic Park come to mind) The ancient fossil coelacanths were small; there is a life-size model of a coelacanth in the first floor geology/fossil exhibit in Room Hall on the WMU campus.

H - - - - - - QED: The Strange Theory of Light and Matter / Richard P. Feynman (1985) II,IV

This bookist has had some books about Feynman, it seemed with the addition of the Modern Physics students to the textbook, that one should add some of Feynman's best known work. QED stands for Quantum Electro-Dynamics, and it seems like probably isn't a better person to discover than that "The Chain of Thought", I talistically 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 read the book for the biographical part, this seems too tough.

H - - - - - - Life Meets A Life in Physics / Ruth Levin Sime (1996) II,IV

Elsewhere in the booklist is a book about Rosalind Franklin, whose X-ray crystallographic work led Watson and Crick to determine the structure of DNA and win the Nobel Prize. Franklin probably should have shared in this triumph, but her untimely death from cancer prevented any arguments or revision of history as to who did what. (The Nobel Prizes for science cannot be given posthumously). Lisel Meitner, on the other hand, died in 1968 and there is no question that she was robbed of a Nobel Prize for a crucial link of Physics that led us into the Atomic Age. If you have a streak of decency in you, you'll be appalled at how Meitner was treated by the nearly completely male Physics community, but I wouldn't want to put opinions in your head.

H - - - - - - Nobel Prize Women in Science. Their Lives, Struggles, and Momenents Discoveries / Sharon Bertsch McGrayne (1993) II,IV

Sharon Bertsch was, as I recall from a talk he held to give her an award on this subject, a journalist in Michigan for a time, so there is a nice local connection, and is married to a physicist. You might ask what the latter has to do with this mini-review. Well, consider that many of the women scientists in this book were either assumed to be merely the assistants of their husbands, or not suitable to be seen in the public halls of science and so toiled in basement, attics, or futuroved advanced students in their homes. Many of the earlier stories are about women who were doing nothing for their teaching and research, simply because they were women. The stories of Rosalind Franklin and others denied the Nobel Prize are also included here, not because of some post-modern feminist revisionist thinking.
but because scientists today have recognized their real contributions. Considering that there are many in science who unabashedly are scrapping for the big prize, it is remarkably refreshing to read success stories against a backdrop of odds that seemed guaranteed to create only failure.

Space, The Final Frontier

**The Right Stuff** / Tom Wolfe  
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 spacecraft - the movie is mostly pretty accurate. (But don’t just review the movie!)

**Apollo 13** (original title: *Lost Moon*) / James Lovell & Jeffery Kluger  
Forget science fiction adventure billions of light years away: imagine being one of just three human beings, really and truly separated from the teaming billions on Earth by one-quarter of a million miles of the real hard vacuum of space... and having something go seriously wrong with your spacecraft. Lovell commanded the real Apollo 13, the mission that didn’t make it to the Moon, wrote this compelling story. Tom Hankis always wanted to do something about this mission, and when Ron Howard ran across *Lost Moon*, their agents got together and...

**October Sky** / Homer H. Hickam, Jr. (1998)  
One of the real sleeper movies of early 1999 was *October Sky*, based on this real-life story of a kid who goes from a dead-end future in the West Virginia coal mines to building model rockets with some friends – to getting serious about rocketry and eventually working with the Big Toys that NASA operates. For most of us, the era of Sputnik is as foreign as living in a company town in the middle of nowhere.

**Dragonfly: NASA and the Crisis Aboard Mir** / Bryan Burrough (1998)  
Fire, poisonous gases, collisions, uncertainty about who is paying the bills – these are all things that can make life tense on Earth. Imagine having them happen in Low Earth Orbit. In the summer of 1979, America’s space station, Skylab, fell back into Earth’s atmosphere – a victim of solar max activity swelling the atmosphere, delays in getting the Space Shuttle flying and a Congress too cheap to buy an adapter to allow a rocket motor to be put on Skylab and save it. While we are still waiting for the assembly of the next American space station, NASA rented some space on Mir (Russian for peace). With the end and breakup of the Soviet Union, Mir’s history has been pretty much a roller coaster. Kept on for years past its design life, because it is all that either NASA or the Russians have in space, an odd collaboration between former Cold War adversaries aboard the "dragonfly" in the sky.

Science Fiction and Technical Novels

**Rendezvous with Rama** / Arthur C. Clarke  
I read this one for a high school physics class book report and concluded that this is actually a physics textbook superbly disguised as entertainment. The two sequels (*Rama II* and *The Garden of the Rama*) are much more into the people than the science and just don’t work very well as fiction or science. There is also a new computer videogame based on the Rama expedition, and there may be a movie in the works, too.

**Stallion Gate** / Martin Cruz Smith  
The backdrop to this story is the Manhattan Project, as we follow the main character, a Native American Army sergeant, who is also J. Robert Oppenheimer’s driver. Not only does this place us in the middle of the action, but he has legitimate reasons for getting all these people to explain what is going on to the rest of us. Stallion Gate was the location of the first atomic bomb test and nearly all the characters in this historical novel are real.

**Wenday** / Whitley Strieber and James W. Kunetka  
Not to be obsessed with nuclear weapons, but this story is written as if the two authors travel across America several years after a very limited nuclear war. Our culture is so dependent on high technology, yet few know how fragile these systems are. Very believable from both the scientific/technical and the sociological ends. (And I have always hated California, anyway...)

**Nature’s End** / Whitley Strieber and James W. Kunetka  
Although I personally think that *Wenday* holds together better, this tale of what might happen to our ecosystem in our lifetime is too important to ignore. The scariest part is that the authors don’t really end the story; indeed they cop out and Merly invoke “magic” as a solution, which only makes it MORE depressing!

**The Andromeda Strain** / Michael Crichton  
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 is true and what is story. (There really is a Jeremy Stone and all those publications of his listed are real.) A secret satellite falls out of orbit and the entire population of the town of Piedmont, Arizona is mysteriously wiped out. Well, almost everyone. Will the scientists understand what is going on in time? You’ll just have to read the book (don’t just rent the movie). Sci-fi, sure, but it is often mentioned when real plagues like Ebola are mentioned.
Sequels. The movie is also excellent, starring Roy Scheider (now seen as the Captain of the SeaQuest) and offering those 
"blows to the face", but once again, the movie and the book are different and (trust me on this one) Dr. Phil knows the difference.

Sequelmania. Years after Clarke had finished 2001, he got the bug to go back and expand the story and to try to 
make it more believable. Some people (like the author) are trying to rile the Super Bowl crowd that the technology is real, but a certain amount of it can be skinned or skipped if you want to get back to the story. Jack Ryan, who has been played in the movies by Al Pacino and Harrison Ford, is the main character in both the book and the movie.

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 was managed to 
travel in a time machine and survive and bring civilization on whatever distant island that he happened to be shipped-wrecked on. In this tale, intrepid heroes are Union supports 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 all manners of science, 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 abridged and unabridged versions of the book, as noted in From 
the Earth to the Moon... is much longer inventories and descriptions of things in the latter.

If you watched any TV around New Year 1995, you probably ran into the networkMCI commercial with the strange 
clip of a computer depreciation. The National Information Superhighway is coming. Internet is already here. Who's computers are heavily networked. At what point does an Information network have so many 
computers and connections that it no longer is "just a tool", but becomes self-aware? This is the problem faced in 
this SF story where the government deliberately sets up a space station just in order to try to force the issue. The 
results don't quite match up with the expectations, which is pretty much what you'd expect. We tend to give all kinds of written warnings and attempts to computers, though any tendencies toward personality are strictly the result of 
programming. This story really discusses some of the stuff that computer science people have been batting around 
with Artificial Intelligence (AI) for years.

In the year 2001, we were about to send Men To The Moon and American companies like Pan Am seemed invincible in the world market. Clarke wrote and rewrite this story over time (other 
versions can be found in the rare paperback The Lost Worlds of 2001 / Arthur C. Clark) while Stanley Kubrick 
struggled to make this first super-realistic looking space movies. Douglas Trumbill 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 
70's, 80's and 90's, cut their teeth on this one. Still, the movie is no flop the first 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 men-apes, the Monolith, our intergalactic astronauts, and of course, HAL, the 
computer. (Change each letter in HAL's name to the next one in the alphabet to get the joke.) People who fall 
asleep in the movie find the book exciting, which is a good thing considering that this is a book report not a movie 
review. A classic.

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on computer technology. The big difference between abridged and unabridged versions of the book, as noted in From 
the Earth to the Moon... is much longer inventories and descriptions of things in the latter.
It almost seems unnecessary to have another Crichton novel to the booklist; but then no one has ever written anything quite as good as "The Andromeda Strain" or " Disclosure" or "Event Horizon". A good science fiction writer there will not appear in this list – and for good reasons. But Airframe works very hard to give the reader some insight into the what-if scenario of flying together some of the most complex machines in the world. Airframe is a real time adventure story with some tough physics principles that we've worked on all semester come into play here. A fast read, and maybe educational, too. 

Alternative Realities (Science Fiction and Fantasy)-------


The Harry Potter books are three books off of the New York Times Fiction List; they changed the rule so that they
dump them onto a new "Children's List". But despite motivating millions of kids to suddenly start reading books, a lot of
adults are reading Harry Potter, too. So, is there anything scientific about Harry Potter? Well, there's magic, and how
magic is used, the rules it follows, the morality and ethics of using them. Sounds like an analogy to me! Just so you
don't get off "easy", you will be required to read the first three Harry Potter books. Read just one, and you'll face
50,000 point deduction. Page count is 7 pages, two pages per book, plus one for intro/summation. If you've already
read the first three Harry Potters, read Harry Potter IV and discuss the whole series in 8-9 pages. Upped that you
have to read or write so much? Pick a book for grown-ups off the list!

The Difference Engine / William Gibson and Bruce Sterling

I debated about putting this book on the list for two years. This is sort of reverse engineered science fiction. Charles
Babbage worked on making mechanical computing devices. His greatest effort, the Difference Engine, was never
finished, and although he is often credited with creating the first computer, in fact it didn't really work at the time. --
But what if it had? What if Victorian English engineers had not just the power of iron, steel and steam, but of the
Difference Engine? Victorian engineers have always intrigued me: they seriously believed that they could build
anything, but they were also so arrogant to assume Man's superiority in all things in this world, so they didn't give
a damn about the consequences of their actions. (You want the complete Dr. Phil Existential Gestalt Experience?
Compare and contrast the social impact of computer technology in this book and in The End Of The World as We Knew
It). 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, not-so-literate style that seems somewhat realistic. Reader discretion is advised.

Neuromancer / William Gibson

I spent the summer of 1994 reading maybe eight or nine "cyberpunk" novels, a genre of science fiction that deals
with the conflict between advanced technology and how society will hold together with the promise of some of the
weight of all that high technology. If you ever saw the Harrison Ford movie Blade Runner, then you've seen some
of the dark film noir quality that the cyberpunk movement has introduced into SF. These two guys wrote The
Difference Engine, listed earlier, Neuromancer, which has several sequels (and some short story prequels in Crystal
Express and others), is kind of a hacker "cosy" set in the Wild West of cyberspace and generally poking fun at how
corporations and the military take the superpower roles in the cyberpunk future. The main characters, Reilly and
wallpaper incorp., would rather one another (and each other) than actually work. It is a true action adventure movie and
great fun; it's hard to keep score as to who the goodbad guy are. The recent movie version of Neuromancer from
a Gosford Park story of the same name (included in a collection titled Bunch of Crap) is and is from the same
Gosford Penumbra, the Net on the other hand, is the way the world is going to be, but there is a great adventure
future. While there is a sort of adventure mystery to justify a story, having part of the story in this book is the kind of
New Age/healthy lifestyle slash global corporations slash Amway/entrepreneur slash liberal/socialist/goodneighbor
problem common to many SF stories, it is interesting condeuce to collapse the history of metallurgy into a short
story, time, going from iron to aluminum, to steel, to case hardened steel, and the consequences of having such advances. If
you saw the Summer 1999 movie The 13th Warrior, you might be interested in this book as a way of learning more
about the early technologies of steel and what was going on in 922 A.D.

Grass / Shen S. Tepper

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 native animals in mimicry of an old style English fox hunt -- and this is
where the mystery begins. I put it in this section, rather than under regular Science Fiction, because, well, it's a strange
book and while I liked it, I know some people have had some weird reactions to it. (We own a copy because a friend
of ours was too weirded out by it to keep it in her house!)

Time Travel/ "What If"

Time travel has fascinated science fiction writers for a long time. Imagine going back and seeing what really happened
Jack Finney's What If story uses an ingenious concept for time travel: that we are trapped in our own time by all
the other possibilities of what could have happened. As with Andromeda Strain, Disclosure and other stories, it has
to be detected the timeline so that there are unusual pressures on the protagonists, but that tends to help move the story along. For WMU PHYS-102 students, this is a nice example of systems interactions at work; for WMU PHYS-107 students, you'll see a lot of the

Harry Potter is definitely an odd sub-genre of science fiction. We can imagine traveling to other stars, even if it really might take extraordinary time and measures, but how ... Is it, will it, could it be possible that we might travel in time. The SF author doesn't worry about such little details. The fun in time travel stories is the potential for the unusual juxtaposition of events or the paradox of interfering with the past. In Card's story, Columbus is being identified as a nexus in history -- because of his success in crossing the Atlantic, he brought untold misery to millions of people, native peoples wiped out or conquered and displaced, slaves brought in as a cheap labor source. (This is sort of the modern revisionist view, which showed up in the movie 1492: The Conquest of Paradise, among other places.) So ... what if you could change what happened? Would you do it? Would you do it even though you know that it would change everything in your own time? That the era and the peoples that live everywhere would suddenly cease to exist and a whole new history would unfold from the time of your meddling. And you thought that you was tough deciding where our garbage should be disposed off!

World War: In the Balance / Harry Turtledove (1994)

So here we are, the Americans and the British and the French and the Soviets, happily fighting the Nazis, the Italians, the Japs -- it's just WW II as we always knew it. Until the aliens attack. Now, just typing this stuff seems ludicrous, and it is a topic that is included in other booklist books (Footfall or just other unexpected alien encounters such as, Inherit the Stars, Rendezvous with Rama). But what Turtledove is noted for is the breadth of detail and story. His earlier work, The Stars in the South, postulates what would have happened if General Lee's Confederate Army had 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 neat book that seems to be missing from this version of the booklist) or place it in a different context. Often that is 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 Hammer and the Cross / Harry Harrison (1993)

Despite what you read about King Arthur, modern England really was established in 1066. But what if the Battle of Hastings had happened in 866? And the Vikings had won? This is the beginning of a series that put a very different view of history, the Renaissance and the use of other stars, even if it really might take extraordinary time and measures, but how ... Is it, will it, could it be possible that we might travel in time. The SF author doesn't worry about such little details. The fun in time travel stories is the potential for the unusual juxtaposition of events or the paradox of interfering with the past. In Card's story, Columbus is being identified as a nexus in history -- because of his success in crossing the Atlantic, he brought untold misery to millions of people, native peoples wiped out or conquered and displaced, slaves brought in as a cheap labor source. (This is sort of the modern revisionist view, which showed up in the movie 1492: The Conquest of Paradise, among other places.) So ... what if you could change what happened? Would you do it? Would you do it even though you know that it would change everything in your own time? That the era and the peoples that live everywhere would suddenly cease to exist and a whole new history would unfold from the time of your meddling. And you thought that you was tough deciding where our garbage should be disposed off!

Airframe / Michael Crichton (1996)

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When a school shows Still the fancy new technology computer classroom they've installed, his first question is not what so many megahertz, but what was the room used for before?

**Visions of Technology; A Century of Vital Debate About Machines, Systems and the Human World**

edited by Richard Rhodes (1999)

Richard Rhodes' *The Making of the Atomic Bomb* gets high praise earlier in the booklet. This book is not about Rhodes' writing. But the collecting of dozens of writings of others, written in a different time than ours. Hindsight is a powerful visionary – reflection is revealing. This would not be an easy paper. If you just start citing a list of topics or comments, you'll have missed the whole point. To see the bigger picture. What is Rhodes trying to put together with this collection of items? What does it say about the 20th Century? The 21st Century? Us?

**Booktopping; Douglas Engelbart, Coevolution, and the Origins of Personal Computing**

Thierry Bardini (1999)

PC’s are so commonplace today, that it is hard to imagine life without them. But not only was there a time (at not that long ago) that there weren’t PC’s or the Internet or Windows, someone had to come up with the “idea” of the PC, the Internet or Windows, and someone had to figure out how we would use them. Bardini feels that Douglas Engelbart and the story of this Augmentation Research Center at the Stanford Research Institute has been neglected. “We’re not talking about bragging or patent rights here — we’re talking about that vision thing.”
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 falls right down. Forget the lawyers and the lawsuits, these books look at the “why” of structural engineering, past and future. There are thousand year old structures that are still standing today while some pretty expensive modern real estate and father of the American H-Bomb, personally sold President Reagan on the merits of the Strategic Defense Initiative, even as the American Physical Society and other scientific organizations said it couldn’t work. If you are looking for 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) taking the time to tell some stories and give the readers some incite ... to read this book, you may find that many of his topics are familiar stuff from your introductory physics course.

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.

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 sodas and major appliances? (They are shipped and sold to the developing countries, to need them more than they worry about brand names or newness. In other words, they are REALLY recycled.) It’s nice to see a mechanical engineer who can write take the time to tell some stories and give the readers some incite ... to read this book, you may find that many of his topics are familiar stuff from your introductory physics course.

II,V,VII

My wife ran across this book and enjoyed it so much she passed it on to her old Astronomy professor from college. 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 sodas and major appliances? (They are shipped and sold to the developing countries, to need them more than they worry about brand names or newness. In other words, they are REALLY recycled.)

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 falls right down. Forget the lawyers and the lawsuits, these books look at the “why” of structural engineering, past and future. There are thousand year old structures that are still standing today while some pretty expensive modern real estate and father of the American H-Bomb, personally sold President Reagan on the merits of the Strategic Defense Initiative, even as the American Physical Society and other scientific organizations said it couldn’t work. If you are looking for 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)”
For those who want a more technical treatment than Petroksi's To Engineer is Human, this book offers a different experience and format. The explanations provide a broader perspective on the development of technologies and their impacts on society. The topics covered include engineering ethics, the relationship between science and technology, and the role of engineers in society.

- **Skunk Works: A Personal Memoir of My Years at Lockheed** / Ben R. Rich and Lee Janos (1994)

This is a personal memoir by Ben Rich, the founder of Lockheed's Skunk Works, which was one of the great technological giants of the 20th century. The book provides a fascinating look at the inner workings of the company and the development of some of its most famous projects, including the SR-71 Blackbird and the F-117A Stealth fighter. The author, a former submarine propulsion specialist, also discusses the broader implications of the Cold War and the role of technology in shaping world events.

- **The Terminal Man** / Michael Crichton (1970)

Published by Doubleday, this novel is one of the great technological giants of the 20th century. It tells the story of a pathologist trying to solve a murder with the help of a computer, a precursor to the modern field of bioinformatics. The novel was made into a successful movie (1974), directed by John Frankenheimer, and starring Mark Harmon and Lois Nettleton. It also inspired the creation of the field of computer forensics.


This book explores the development of the telegraph and its impact on society during the Victorian era. Standage presents a fascinating look at the people who were involved in the development of this technology and the ways in which it transformed communication and society. The book includes a guide to the telegraph's role in the history of the internet.

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The Terminal Man is a classic work of science fiction that explores the intersection of technology and society, and its influence continues to be felt today in the fields of computer science and forensics.

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**Bibliography**

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 is so much more to the story in the book. You'll never look at another diet or special food in the same way again. Science? My dear sir or madam, this is all in the name of Science!

The Body Farm / Patricia Cornwell (1996)

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 right 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 public health.

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 holds 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 hyperbole by pointing out that the HGP is not revealing the entire human genome, and that there are some of the averages of the common man (whatever anyone chooses to that 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 science. A lot of our DNA strands that various traits are controlled. And in the Year 2000, two scientists at different institutions stunned 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 biology, and a general thinking that "this is totally new" "we've never been before here". But realistically, that's not true. And technical historians can still illuminate our present with the past.

A Thread Across the Ocean: The Heroic Story of the Transatlantic Cable / John Steele Gordon (2002)

Nothing engenders interest in a fine book like a compelling movie. And a hit movie about a high-end mathematician? Never happens. There is no question that A Beautiful Mind, starring Russell Crowe and Jennifer Connelly, deserved the attention it received, but anyone reading the book will wonder once again how Hollywood managed to do it—create a completely different story and emphasis. However you cut it, the point remains that here is a man labeled as a genius, who worried mightily about "making a contribution" to his beloved mathematics, who disappears into a hellish world of schizophrenia, only to reemerge by his own will able to accept a much deserved Nobel Prize in Economics (there is no Nobel in mathematics).

Déjà Dead / Kathy Reichs (1997)

As Hawking himself admits in the Foreword, he never expected A Brief History of Time (1988) to be the success it has been, especially considering the difficulty of the subject matter. Science educators worry that too many of the people who bought that book did so merely to put in prominently on their coffee tables or bookshelves as if pretending to have read it. And many of Dr. Phil's students who have tried Brief didn't necessarily do so great a job either reading the book or writing the paper. So I join with Hawking in having some trepidation in adding this book to the list—Hawking finally deciding he didn't want to do Son of A Brief History of Time, so much as updating and reemerging by his own will able to accept a much deserved Nobel Prize in Economics. No need to worry about the book, have you tried the movie? It's technofiction, coupled with World War II code decryption, deceit and coroner accounts fascinate us, whether fiction or fact. It isn't just that we all gosh_darn monsters on the inside, honesty!), but there is the intellectual puzzle of evidence, statement, clue and deduction. In this science of determining time of death, time represents both information and the enemy. At the moment of death, the complex chemical and biological systems in our bodies stop or slow, and various levels of degradation and invasion begin to set in. Science has progressed far beyond just measuring the state of rigor mortis or body temperature — and the Tennessee research facility described in Patricia Cornwell's The Body Farm is not fiction, but fact. Cool…

The Universe in a Nutshell / Stephen Hawking (2001)

End of List