Weird Science (JINS 375)
Syllabus

Taner Edis

Fall 2008

1 How to Find Me

The best way to reach me is e-mail, *edis@truman.edu*. Otherwise, you can try calling my office at 785–4583, or faxing me at 785–4045.

I will have office hours from 10:30 to 11:00, from 13:00 to 13:30. and from 16:30 to 17:20 every Tuesday and Thursday, and from 15:30 to 16:20 Wednesdays. Of course, there's a good chance I will be around my office at other times as well. To see what hours I am most likely to be available, check my typical schedule (*www2.truman.edu/∼edis/courses/schedule.html*).

I will be using the Internet to post course-related notices and documents. Bookmark the JINS 375 home page: www2.truman.edu/∼edis/courses/JINS.

2 Schedule

Class: Tuesday and Thursday 13:30–14:50, MG 1090.

Final Paper Due: Tuesday December 9, 12:00 noon, MG 3004.

3 Course materials

I'm requiring you buy one textbook, *How to Think About Weird Things* by Theodore Schick, Jr., and Lewis Vaughn, 5th edition. It takes a skeptical view. I would have had you buy a book defending creationism, parapsychology etc., but there is no single book which combines the believer's viewpoint on all the paranormal and fringe-science topics we will discuss.

I will assign reading to you about once a week. This will be from Schick and Vaughn, web resources, and I will also distribute copies of articles. You will have quizzes in class based on your reading.

4 Course Overview

Is the universe only a few thousand years old? Can psychics speak with spirits of the dead? Or has contact with extraterrestrial visitors been covered up by a massive government conspiracy?

Scientists usually leave such questions to supermarket tabloids, grumbling about public science illiteracy and refusing to engage disreputable ideas. However, "weirdness" like psychic phenomena, alien abductions, and more traditional religious supernaturalism consistently attracts popular interest and support. Ours is the time of paranormal shows on TV, large New Age sections in bookstores, and battles over evolution education in many states, including Missouri.

Moreover, paranormal and fringe-science claims have many articulate defenders, in and out of academia. UFO investigators, "Intelligent Design" proponents, and laboratory parapsychologists all insist that they have legitimate scientific arguments to make. If they were only given a fair hearing, if they could only overcome the closed-minded dismissal they face, they could demonstrate how mainstream opinions are radically mistaken.

So we will join the debate between skeptics and believers. First of all, because the questions are interesting. Asking whether life is a product of explicit design, or whether some people can demonstrate supernatural mental powers engage many of us. Looking at how science addresses these introduces some fascinating current ideas. However, doing this also takes us beyond the transmission of established knowledge common in science courses. Because these are controversial matters, we will be able to get a taste of how scientists operate while exploring new territory, when criticism and heated debate are the order of the day. When discussing "weird science," questions about the *process* of science become clearer than with a survey of undisputed knowledge.

We will address UFOlogy, creationism, and parapsychology in particular. In each case, we will start by discussing their claims. Then we will go on to the mainstream scientific response, seeing why scientists consider such claims to be theoretically implausible and supported with weak evidence. Common skeptical themes will be caution in accepting "extraordinary claims"

which attempt radical revisions in our picture of nature; the unreliability of anecdotes, testimony, and uncontrolled studies; and the unacceptability of statistical results with marginal effect sizes.

We will then consider possible rebuttals, such as charges that the scientific community has dogmatically rejected paranormal claims or arbitrarily excluded personal testimony as evidence. We will address questions raised when proponents of paranormal claims say that the standards of conventional science unfairly exclude their phenomena, and that their work challenges science to revise its methods and norms.

Our central theme in all this will be to learn to see science as a process of critical inquiry foremost—not as a body of assured facts, not as the application of a cut-and-dried method. Hence I will look for proper criticism in your work, rather than whether you can reproduce "correct" answers.

5 Interdisciplinary Aspects

Trying to understand fringe science invites approaches from multiple disciplines. We find physicists and psychologists arguing about the scientific merits of specific claims, folklorists examining themes in UFO abduction narratives, sociologists studying "weird" beliefs in religious movements, or forensics specialists investigating paranormal mysteries. An expert observer of creationism has to be familiar not only with the relevant biology and physics, but also know something about religion, the philosophy of science, and the social circumstances which support populist epistemologies.

So a student from practically any major will find opportunities to inject their perspective into the work they do on "weird science." I will, in fact, encouraged you to use your own background as much as you can, even as I emphasize the scientific and the philosophical modes of inquiry.

Examining parapsychological claims, for example, requires understanding something of the perspective of a mainstream physicist or psychologist, particularly how they use the methods of their disciplines to criticize such claims. However, a specifically *philosophical* approach also comes into play, where these methods are subjected to criticism. A philosopher would typically stand back from the debate, ask questions on how we might best attain knowledge, and question in what sense science might approach truth, without letting current scientific practice have the last word.

Combining science and philosophy in this course requires that the student

integrate these perspectives in thinking about "weird science." The object is not to write a few paragraphs of science-based analysis and then to switch to a philosophers' voice—debating paranormal claims requires an approach where philosophical and scientific views interact and correct one another.

6 Writing Assignments

Our focus will be on developing skills of intellectual criticism rather than mastering a body of knowledge. But producing well-written essays, though important, is not the only goal. It is easy to find very persuasive, even eloquent arguments which are selective in evidence, highlight weak representatives of rival viewpoints, and seek to score debating points rather than advance genuine inquiry. Instead of just effective advocacy, I want you to practice proper criticism—especially in characterizing opposing views fairly and understanding their intellectual attraction.

6.1 Writing topics

You will have five short papers to write during the semester, and a long final paper.

The five short papers will be on the following subjects:

1. The nature of science. (800 words.)
2. UFOs and alien abductions. (1200 words.)
3. The question of cognitive relativism. (800 words.)
4. Creationism and intelligent design. (1200 words.)
5. Psychic powers and parapsychological research. (1200 words.)

I will give you a list of prompts and possible points of view you can take as we get into each subject. I will post these on the course web site.

These short papers will have to incorporate research and references that go beyond what we discuss in class. The better papers will take risks, and defend strong positions. For example, you might investigate the populist aspect of creationism, tying it to philosophies of commonsense realism and the populist democratic strain in American culture. Then you might connect this background to current debates over creationism in education, and perhaps

even make a case that defenders of evolution have taken a heavyhandedly elitist approach.

The final paper should be longer, about 2000 words. You have the option of writing on one of these topics:

- How much *trust* should we put in science, or other institutions which make claims about reality?
- Is personal testimony about paranormal matters good evidence?
- In light of our discussions of paranormal issues, what do you think about the relationship between science and spiritual beliefs?
- Are the claims of alternative medicine (homeopathy, faith healing, acupuncture, etc.) scientific? Are they reliable?
- How should high school students be taught about topics such as creation/evolution or UFOs?

Alternatively, you can propose your own final writing topic, but I will have to approve it before you go ahead. For example, if a nursing student is intrigued with the paranormal "Therapeutic Touch" healing claims which have made inroads in nursing, that will be fine by me.

6.2 Groups and abstracts

For each topic, I will place you in a group of about three to four students. You will work together to produce an abstract—a short paragraph briefly describing the point of view you are going to take and hinting at what arguments you will use. The abstract will be due about a week before the papers themselves. You need to *agree* with those in your group about the abstract—so be sure to to argue it out among yourselves before presenting it! I will also have groups discuss questions among themselves in the class, and then represent any conclusion they reach to the rest of the class.

The abstracts will be a group effort, and no doubt papers produced by members of the same group will share many of the same references etc. Nevertheless I require each paper to be an individual effort—*your own* writing, with your own development of the arguments and points of view you hashed out together as a group.

For example, say you want to argue that the "Roswell Incident" was real crash by an alien flying saucer, and that the government has been covering up its knowledge. Your abstract might look like:

> **Abstract:** While many UFO sightings are due to misidentifications or hoaxes, some are observations of real alien spacecraft. The best evidence for this comes from crashed saucers recovered by the US government, especially the well-known "Roswell Incident." Trustworthy eyewitness testimony indicates not just that saucers have been recovered, but that the military has been engaged in a massive cover-up. The recent official explanation of "Project Mogul" has numerous problems, and is worth little except as an admission of a cover-up.

6.3 Your audience

Do not write as if I am the person you are writing for. Write as if you were composing an article for the student newspaper. In other words, the audience you should have in mind is your fellow students: bright, reasonably well-informed, but not necessarily deeply knowledgeable about the exact topic you're addressing. (You can assume that your readers have the basic background information about your topic, so don't waste space on that.)

You should avoid saying things like "as we discussed in class" in your paper.

6.4 The content

Many of you are used to writing report-style papers in science courses, or creative writing in English courses. I am looking for something different, which includes aspects of both reports and creative writing.

Reports typically present established knowledge. They don't have much individuality, and they tend to rely on the authority of published research, textbooks and so forth. *Do not write a report!* I want to see your own voice in your writing, to see you argue and directly engage with the claims you're supporting or criticizing. If you fall into the habit of doing some background research and synthesizing what you find, that's not good enough. I want to see your particular argument.

Creative writing is much more individual. But while I want to see some individuality in your writing, don't get carried away and make your writing center on your personal reflections. You want a good, convincing *argument* to be your centerpiece. Anecdotes and personal experiences are very helpful in livening up your writing, so include them if you can. But don't let your case rest on such personal experiences alone. You want to use them to illustrate a more general argument you are making.

In other words, strike a balance between individuality and reports.

The grade for each of your papers will depend equally on my judgment of the quality of your writing, and the quality of your argument. Both elements need to be there.

6.5 Presentation details

Turn in one *double-spaced* hardcopy of each paper. I will cover it in red ink and give it back to you.

Papers you turn in should avoid mistakes in basics such as spelling and grammar; these detract from the presentation and will reduce the grade you receive. Papers must also be well-organized and present a coherent case. I expect you to be already proficient at basic writing; I'm looking for more than an ability to string sentences together.

6.6 Citations

You should cite appropriate and varied references. Consult a number of relevant books, articles and similar resources. The reading I assign in class before an assignment is due will typically also be useful as a reference.

I would like you to consult both sources that you agree with and those that present an opposite point of view. It's not good if your reference list consists almost entirely of sources that support your point of view. *If you're arguing against a certain claim, you should consult* ***firsthand*** *sources defending that claim.* It's not good enough to just look up sources criticizing what you oppose.

Because there is a lot of fringe-science material that is available primarily on the web, I allow citations of web sites. But if at all possible, restrict your use of web sites so that they're only supplemental. It's too easy to run into untrustworthy sources on the web. Furthermore, there are three rules for web citations I must insist upon:

1. *Never* cite an encyclopedia-like source, in particular Wikipedia, as a reference. This is not admissible in serious writing. Such sources are useful to give you a basic introduction and background, and maybe some links to check out, but that is all.
2. *Do not* cite dictionaries. In fact, you should never write any line that goes like "the dictionary definition of XYZ is. . . "
3. If you include web references, you *must* also e-mail an electronic copy to me in a format that allows me to click on your links. HTML, PDF, or Microsoft Word will work. I can't read WordPerfect.

6.7 Citation formats

If you're already used to one of the standard formats for references, footnotes, or endnotes, you can use that. As long as you're consistent, and I can understand your citations, everything is fine.

If you're not used to any, here is the format I prefer:

Books: If you wanted to cite something from pages 73 and 75 in your textbook, your paper would include something like this:

> As Schick and Vaughn (2008: 73) point out , . . .
>
> "Ordinarily, if a proposition fails to cohere with the rest of our beliefs, we are not justified in believing it" (Schick and Vaughn 2008: 75).
>
> **References**
>
> Schick, Jr., Theodore, and Lewis Vaughn. 2008. *How to Think About Weird Things: Critical Thinking for a New Age* (5th edition, Boston: McGraw-Hill).

Articles: If you wanted a cite an article in the journal *Reports of the National Center for Science Education*, volume 27 and number 3-4, pages 31 to 34, you would go about it like this:

> Educators dispute the value of including intelligent design in science classrooms (Borenstein 2007).

References

Borenstein, Jason. 2007. "Recurrence of the Same? 'Intelligent Design' and the Biology Classroom'," *Reports of the National Center for Science Education* **27**:3-4, 31-34.

Web Sites: Include author and date if you can. Use "n.d." (not dated) if no date is available. Use "Anonymous" if no author is known. Always include the full URL, and don't forget to send me an electronic copy I can click on. Here's how it would go:

> UFO researchers are especially interested in strange sightings recorded near airports (for example, Rodeghier n.d.).
>
> **References**
>
> Rodeghier, Mark. n.d. "UFO Seen Over OHare Airport," http://www.cufos.org/ohare.html (Last visited: 8/19/2008).

Note the "last visited" information that you must include. This is because the content of web pages is changeable.

The reference list should be in alphabetical order.

7 Course Schedule

This is intended as a rough outline—assigned readings and due dates may change. I will announce any changes in class.

7.1 Introduction

Overview of the fringe of science: astrology, biorhythms, homeopathy, and other claims—what does "weird science" mean? We will discuss questions such as "what is a theory and what is a fact?" and "what difference is there between science and so-called 'pseudoscience'?" Your first writing assignment will be on the same questions.

Writing: Assignment 1. Due September 9.

Reading: Schick & Vaughn chapter 1, 2, 4, chapter 6 pp. 164–190. Susan Haack handout.

7.2 UFOs

We will discuss UFO-related beliefs with an eye to applying what we have learned. We will start with "nuts-and-bolts" UFO claims, that strange sightings in the sky can be explained as extraterrestrial spacecraft, and then examine variations like alien abductions, crashed saucer coverups, UFO-parapsychology linkages, and UFO religions.

Writing: Assignment 2. Due September 30.

Reading: Schick & Vaughn chapter 5, chapter 7 pp. 228–235 and 244–257. Some handouts or web sites on which I will decide based on how class discussions are going.

7.3 Cognitive Relativism

We will define and address cognitive relativism, the notion that one set of beliefs about the world are just as good as any other. We will briefly debate whether science is just another "way of knowing," no better than any alternative.

Writing: Assignment 3. Due October 14.

Reading: Schick & Vaughn chapter 8.

7.4 Creationism and ID

We will discuss the varieties of views on creation and evolution: Young-Earth creationism, intelligent design, various kinds of liberal compatibilism, nonreligious views. We will also look at aspects of the debate that might especially interest us, such as questions about whether creationism can be excluded from science because it does not follow the ground rules of science, and who gets to define the rules.

I hope to invite a couple of speakers to present defenses of creation and evolution to the class.

Writing: Assignment 2. Due November 4.

Reading: ICR Tenets of Creationism. Tim Berra handout. Schick & Vaughn pp. 190–206. Phillip Johnson handout. Jean Pond handout. Others?

7.5 Parapsychology

We start by asking what are psychic phenomena supposed to be, how they compare with religious miracle claims, and what parapsychology is supposed to be all about. Then we (with any luck) go into all sorts of related questions the class will be interested in.

We will pay special attention to James Randi's "One Million Dollar Paranormal Challenge" and ask whether its conditions are fair.

Writing: Assignment 4. Due November 27.

Reading: Schick & Vaughn pp. 206-220 and 257–288. Some web sites and handouts, depending on class discussions.

8 Grades

Your grade will depend primarily on the writing assignments. However, I also consider class participation and the quizzes. The quizzes will be made of very short, multiple choice questions drawn from the latest reading assignments.

- **10% — Class Participation:** Activity in and contribution to class discussions.
- **10% — Quizzes:** Multiple choice and similar short questions concerning material covered in reading assignments.
- **56% — Writing Assignments:** The 1200-word papers (2, 4, 5) are worth 12% each, the 800-word papers (1, 3) are 10%.
- **24% — Final Paper:** The final paper due after classes are over.

9 Resources

You will have to consult a wide variety of resources, many which are available through Pickler Library or in my personal library (come by my office and see what I have). The following is a listing of books you might find useful. They

are all available on reserve in the library. I'll be looking to see if you cite relevant books in this list in your papers.

9.1 Books

Wiggins, Arthur W., and Charles M. Wynn. 2001. *Quantum Leaps in the Wrong Direction: Where Real Science Ends and Pseudoscience Begins.* Washington: Joseph Henry Press.

Accessible, undergraduate-level survey of fringe-science, including astrology, UFOs, creationism, and parapsychology. It takes a scientist's point of view, with some very elementary philosophy of science as well.

Grim, Patrick, ed. 1990. *Philosophy of Science and the Occult.* Albany: State University of New York Press.

A more advanced text which is still readable by a well-prepared undergraduate. It reproduces a wide range of articles from different viewpoints and at all levels, addressing astrology, the demarcation problem, parapsychology, and UFOs.

Morris, Henry M., ed. 1974. *Scientific Creationism.* El Cajon: Master Books.

A classic creationist text, edited by the undisputed leader of the movement, which is still invaluable as a guide to young-earth creationism. Intended as a textbook, but used only in conservative Christian institutions.

Dembski, William A., and James M. Kushiner, eds. 2001. *Signs of Intelligence: Understanding Intelligent Design.* Grand Rapids: Brazos Press.

A very accessible, non-technical introduction to "Intelligent Design," a more sophisticated, non-sectarian form of creationism. It includes contributions by almost all the leading lights of the ID movement, and illuminates all aspects of their common concerns and arguments.

Berra, Tim M. 1990. *Evolution and the Myth of Creationism: A Basic Guide to the Facts in the Evolution Debate.* Stanford: Stanford University Press.

Basic biological and geological response to common creationist claims. Accessible to non-science-major undergraduates.

Scott, Eugenie C. 2004. *Evolution vs. Creationism: An Introduction.* Westport: Greenwood Press.

The perfect reference book on the Creation/Evolution dispute.

Shanks, Niall. 2004. *God, the Devil, and Darwin: A Critique of Intelligent Design Theory.* New York: Oxford University Press.

A good scientific and philosophical critique of ID creationism.

Radin, Dean I. 1997. *The Conscious Universe: The Scientific Truth of Psychic Phenomena.* San Francisco: HarperEdge.

By a leading parapsychologist, this is a semipopular survey of current re-

search, with particular emphasis on laboratory work and statistical evidence.

Stoeber, Michael, and Hugo Meynell, eds. 1996. *Critical Reflections on the Paranormal.* Albany: State University of New York Press.

A defense of psychic phenomena from a philosophical and religious studies perspective. Includes articles by many leading scholars which illuminate why parapsychology has religious significance. While advanced, some contributions are good for introducing students to more sophisticated debates over parapsychology.

Zusne, Leonard, and Warren H. Jones. 1989. *Anomalistic Psychology: A Study of Magical Thinking.* Hillsdale: Lawrence Erlbaum.

A textbook which states the mainstream psychological case against paranormal phenomena. An excellent introduction which conveys that conventional science has resources to explain many, perhaps all, anomalous experiences which are said to support paranormal realities.

Emmons, Charles F. 1997. *At The Threshold: UFOs, Science, and the New Age.* Mill Spring: Wild Flower Press.

Sociologist Emmons defends UFO beliefs in many of its manifestations, especially those tying into the wider paranormal and New Age culture. He also presents a sociological analysis claiming to explain why mainstream science dogmatically rejects UFO evidence.

Sturrock, Peter A. 1999. *The UFO Enigma: A New Review of the Physical Evidence.* New York: Warner Books.

A panel of UFO-sympathetic scientists review the evidence and come up with ambiguous conclusions at best. A lukewarm pro-UFO book, with none of the more extreme elements in the UFO subculture defended.

Peebles, Curtis. 1994. *Watch The Skies! A Chronicle of the Flying Saucer Myth.* Washington: Smithsonian Institution Press.

A decidedly skeptical survey of UFO history, from classic cases to today's increasingly bizarre beliefs. One of the best current resources to put UFOs in context.

9.2 Journals

The Skeptical Inquirer

Journal of the Committee for the Scientific Investigation of the Claims of the Paranormal (CSICOP), this is the premiere magazine for skeptical criticism of paranormal and fringe-science claims.

Acts and Facts

Monthly publication of the Institute for Creation Research, the leading creationist organization in the United States.

Reports of the National Center for Science Education
: News items and scholarly papers defending evolution against creationism. Published by NCSE, the leading anti-creationist organization in the United States.

9.3 Internet

UFO Seek *www.ufoseek.com/*
: Vast site with information and links concerning all kinds of UFO, paranormal, and New Age topics.

The Skeptic's Dictionary *www.skepdic.com*
: Robert T. Carroll's continually revised and updated online book skeptical of paranormal claims. An excellent resource.

Institute for Creation Research *www.icr.org*
: Home page of the leading young-earth creationist organization in the US. It includes many of their publications on-line.

Discovery Institute *www.discovery.org/csc/*
: The leading organization behind the Intelligent Design movement.

Access Research Network *www.arn.org*
: A news and article site supporting Intelligent Design.

Talk.Origins Archive *www.talkorigins.org*
: Articles and FAQ's answering creationist claims.

Psychic Science *http://www.psychicscience.org/*
: Informative pro-parapsychology site with a lot of information for those unfamiliar with the subject.

James Randi Educational Foundation *www.randi.org*
: Randi is a well-known magician and critic of the paranormal, particularly parapsychology. Home of the famous million dollar challenge.