



*The North Texas*

# Skeptic

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<http://www.ntskeptics.org>

## Blockbuster

by John Blanton

### **The Making of the Atomic Bomb**

*By Richard Rhodes*

*Simon and Schuster*

*886 pages including a comprehensive index and bibliography (paperback)*

If you ever rented a video you probably wondered where the name came from. In World War II the Brits were bombing German cities, and they developed very large bombs that were capable of taking out a city block of buildings and houses. They were called blockbusters among other terms. Then things got worse.

Richard Rhodes told the story in his 1986 book *The Making of the Atomic Bomb*. The book tells of the development of modern nuclear physics and of the coming involvement of science in the world of politics and war. The book won the 1988 Pulitzer Prize for general non-fiction.

The German word *thal* (tal) means *valley*, and *Sankt Joachimsthal* in the Bohemia region of the Czech Republic was the site of a great mineral wealth. Silver came from the region and later uranium ore. The silver was struck into coins that became known as Joachimsthallers, and the *thaller* became the English *dollar* and the unit of currency for a new nation on the North American continent.

The uranium was the source from which Nobel chemists Marie and Pierre Curie extracted radium. Their discovery also revealed the enormous amount of energy released from nuclear reactions. Einstein had it right. His demonstration of the equivalence of matter and energy showed that a small quantity of matter represents millions of times the energy that can be extracted by chemical processes.

The ruling Magyar nobility of Hungary kept 33 percent of the population illiterate until the early twentieth century. They apparently overlooked the Jews, who comprised only 5 percent of the population, and the Jews profited from this slight by gaining professional ascendancy when prosperity came to Hungary. This gain

## EVENTS CALENDAR

### March Program

Saturday, March 19, 2011  
at 2:00 p.m.

The program for this meeting will include a conversation with Ashley Paramore of the Secular Student Alliance who will speak with us on how to get more student involvement with our local universities and student groups. The program will be presented by Heidi Anderson, via Skype, who will speak on "Sex and Skepticism." Heidi is a skeptical blogger and made a presentation on this topic for a TAM panel.

### Board Meeting and Social Dinner

Saturday, March 26, 2011  
at 7:00 p.m.

*The Island Spot*  
2661 Midway Road Ste. 106  
Carrollton, Texas

If you plan to attend, please call. We sometimes cancel or change these events.

214.335.9248

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 All members receive the NTS newsletter and may  
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 charged at no or reduced cost. In addition,  
 members will receive mailings on topics of current  
 interest or social events.

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brought with it envy and persecution. As a result, a small collection of highly-developed Jewish minds fled Hungary and wound up mostly in the United States in time to help develop the atomic bomb.

Leo Szilard was one of these Jews, and his insight came as he was crossing a London street in 1933. If the absorption of a neutron by an atomic nucleus caused that nucleus to fragment and also to release two more neutrons, then the cascading chain reaction could quickly result in the disintegration of a mass of the affected material with the instant release of a tremendous amount of energy. By the time Szilard reached the opposite curb he had foreseen the end of humanity.

European and particularly German persecution of Jews split the European science community. Nobel laureate physicists Werner Heisenberg, Erwin Schrödinger and Wolfgang Pauli stayed on, and some worked on an atomic bomb program for Germany during the war. German-born Jew Albert Einstein was hounded into leaving, eventually coming to the United States. The pacifist who established the basis for nuclear energy never worked on the atomic bomb project, but early on he lent his name to a letter that went to Franklin Roosevelt recommending its development.

Italian physicist Enrico Fermi won the Nobel Prize just in time to use the cash to extract himself and his Jewish wife from his Fascist homeland. In Chicago his team produced the first sustained nuclear chain reaction within a huge stack (pile) of uranium and highly-purified graphite blocks. This process was ultimately used to produce the new element plutonium for construction of atomic bombs.

Danish physicist and Nobel laureate Niels Bohr was the grand old man of atomic physics, having early in the century proposed the modern model of the atom. Denmark was invaded by the Nazis in 1940, and the Danes were fiercely resistant to the German occupation. There was a quiet and stubborn resistance, one of strict non-collaboration. Bohr's ancestry was partly Jewish, and he was a major champion of this resistance. The Nazis tolerated the resistance at first because they considered Danes to be almost German. However, when the Danes persisted in refusing to give up Jews for deportation, the Nazis clamped down, and Bohr fled the country, going at night in a small boat across the narrow strait between Denmark and Sweden. His trip from neutral Sweden to England was in the bomb bay of a Mosquito aircraft, wearing a parachute and carrying emergency flares. In case the Mosquito was shot down the plan was to drop the old man into the North Sea and hope for the best.

On a wintry day in Sweden Otto Frisch and his aunt, Lise Meitner, stopped on a snowy hiking trail and worked out the energy production from the fission of unstable nuclei. Marie Curie's daughter Irene and her husband Frederic Joliot won the Nobel Prize for work in the transmutation of elements. As war approached they stopped publishing their work, but stayed in Europe and locked their papers in a secret vault.

In the United States Ernest Lawrence developed the cyclotron and used this device for separating the usable 235 isotope of uranium from the mostly 238 mass of the metal. American chemist Glenn Seaborg worked out the means to separate plutonium from uranium that had been bombarded by neutrons in Fermi's pile. From 300 pounds of uranyl nitrate hexahydrate his team produced a microgram of plutonium.

The stage was set. We knew how to get the materials to make the bomb. All that was necessary was to scale up the process.

Army Corps of Engineers General Leslie Groves was a man of big projects. After completing the construction of the Pentagon Building he was tapped for the new Manhattan Project. With a blank check, almost unlimited power and little detailed planning he built in a few months the largest industrial concern in the world at the time. The Manhattan project encompassed wholly new research laboratories and huge industrial plants erected on newly-purchased land. An observer noted later that the United States essentially duplicated its entire automobile industry to build the bomb.

The motivation was two parts. It was known that Germany, the Soviet Union and Japan had the foundations for developing the bomb. To face these adversaries naked in a nuclear world would be unthinkable. The other motivation was expediency.

Since the days of the Great War there had been the dream of having weapons so powerful that an adversary would capitulate before economic and human costs became ruinous. The machine gun proved incapable of providing this benefit, even after the British saw around 19,000 killed in one day. Neither did poison gas provide such a benefit.

Here, also, saw the advent of the warrior-scientist, as German scientists contributed to the development of gas warfare. Otto Hahn was a Nobel Prize chemist, as was Fritz Haber. Together they developed gas agents for battle and even participated in battlefield logistics. Later Hahn fiercely opposed Hitler's program of Jewish persecution and extermination, and he learned in horror of the Hiroshima bombing while in British captivity following the defeat of Germany in World War II.

The early twentieth century also witnessed a numbing of the senses toward civilian casualties. Modern weapons were less discriminating. Not only soldiers, but the infrastructure that supported the soldiers' war became a target. A factory that built guns was bombed, along with the civilian workers inside. Later it became permissible in our minds to also bomb the workers' homes so they would not be able to perform their factory jobs. Ultimately we saw fit to lay waste to large residential areas in futile attempts to force our adversaries to capitulate.

The Germans got the idea early on. Poland was the first to suffer, with Warsaw being pounded to rubble before it surrendered. The German bombing of Rotterdam convinced the Dutch to quickly give up the fight before other cities suffered the same fate. When England refused to make peace following their defeat at Dunkirk, the German air force sought to suppress the RAF in preparation for an invasion. When German bombers hit the city of London by mistake, the Brits replied in kind and bombed Berlin. The Germans then turned

their attention to British cities, and thousands of civilians were killed while the RAF recovered its strength and proceeded to defeat the Germans in the air.

The British and the Americans went on to beat the Germans at their own game and gave that country ten times over its own measure. On a hot night allied bombers set great fires in Hamburg and followed up the next day. Thousands died within a few hours. Other cities followed with Dresden being the most notable with tens of thousands killed over two days of bombing.

On the Pacific side the war against civilians took an even uglier turn. The atrocities perpetrated by the Japanese army and the fanatical determination of Japanese to fight to the death convinced the Americans that threat of defeat would not force the Japanese to surrender. How much it took to harden the heart of General Curtis LeMay may not be known, but he took on the job of bombing the Japanese Empire into ashes.

Raids on Japanese cities resulted in the deaths of 100,000 or more in Tokyo and other large cities. On the last day of the war, after Hiroshima and Nagasaki had been nearly obliterated, LeMay's bombers continued their attacks on Osaka.

Hans Bethe, who determined the source of energy from the sun and won a Nobel Prize, was the instrumental designer of the bomb. Robert Oppenheimer, who grew up as a pampered Jewish intellectual, became the driving

force behind the scientific effort. His surprising administrative skills and enormous scientific talent held the project together and ensured success beyond original expectations. Oppenheimer had vacationed in New Mexico as a sickly youth, and came to know the region around the mesa of Los Alamos. Groves purchased the site on the mesa of a boys school, and the best scientific minds of the early twentieth century came there to work.

In the beginning it was not certain the principle envisioned by Szilard in 1933 could be made to work in a bomb. Uranium 235 turned out to be the only isotope of the metal that had the properties to produce a chain reaction. A small sample would not sustain a chain reaction, because it would lose neutrons before they could induce additional fission. A large enough mass would go in a microsecond without additional help. Somewhere in between the self-produced neutron flux of the metal would multiply until the metal became hot enough to vaporize. The trick was to go from a sub-critical mass to a critical mass in a very short time, before the reaction had time to vaporize the remainder of the metal. There was also the problem of external neutrons. What was a subcritical mass at sea level could become critical at higher altitudes, where neutrons from cosmic rays were more abundant.

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The solution for uranium was to shoot a plug of uranium at high velocity into a sub-critical mass, producing a super-critical mass. This method was so sure and so well worked out in advance that it was not even tested before use. The first atomic bomb used in warfare was a uranium bomb.

Plutonium was another matter. Plutonium 238 has a much shorter half-life than U235, and spontaneous neutrons abound. Assembling a critical mass would be more difficult for plutonium.

The solution for plutonium was to use high explosives to compress a sphere of the metal. The plutonium mass would be about the size of an orange, only with a hollow core. In the initial test on 16 July 1945 about two tons of high explosive, carefully molded and machined into the correct shape to produce a focused pressure wave, was detonated around this core.

The pressure wave collapsed the hollow plutonium sphere. Within the hollow of the sphere was a trigger of polonium, which gave off ample alpha particles, and also beryllium, which produced neutrons in abundance when bombarded with alpha particles. The pressure wave compressed the plutonium metal to twice its density, but could not hold it there. During one brief instant the neutron surge from the beryllium was necessary to ensure there were some neutrons to get the reaction going before the plutonium expanded back to its natural density.

The test was a complete success, producing a blinding flash of light and a fire ball that fused the sand of the New Mexico desert. Standing some distance away, Enrico Fermi measured the yield of the explosion by dropping bits of paper into the surge from the blast. He reckoned approximately 10,000 tons of TNT equivalence. About a gram of matter had been converted into energy.

Three weeks later a uranium bomb exploded over Hiroshima. The physical effects were the same, except a human element was involved. In the order of 100,000 people, mostly civilians, died as a direct result. The lucky ones were those vaporized by the flash. Others, farther away, had their skin instantly burned off by the intense heat.

The bomb released energy in the order of 10,000 to 20,000 tons of TNT, but the effects were not the same as a chemical explosion. The Hiroshima bomb produced temperatures and thermal radiation many times the intensity of a chemical explosion. Additionally, the ionizing radiation from the bomb produced the predicted result of a slow and painful death to many who would otherwise have survived.

At this point the Japanese government was still unsure how to respond. Devastation at Hiroshima was so complete that it took a day to comprehend what had happened. Three days after Hiroshima, a B-29 unleashed a plutonium bomb on Nagasaki. Finally the leaders of the Empire began to realize that in short order the Japanese race would disappear from the face of the Earth unless they could get the Americans to cease

and desist. Surrender was still an ugly word among the Japanese leadership, and a minor revolt in the upper ranks attempted to forestall the inevitable. Still the Japanese rulers bargained for retention of the Emperor, and when the allies agreed, the military government conceded, and the bombing stopped—with LeMay's last mission over Osaka.

One of the Jewish refugees from Hungary was Edward Teller. He was prominently involved in the atomic bomb project, and it quickly became apparent to him and to others that the temperatures and pressures of a fission bomb detonation would induce the fusion of hydrogen, especially heavy hydrogen. Since hydrogen 1 and hydrogen 2 are not radioactive, any amount of the material could be clustered next to the fission bomb trigger, and very large hydrogen bombs could be produced. The first hydrogen bomb was detonated at ground level and produced a crater half a mile deep.

The world has not been the same since. Nation states, a fairly recent concept, have come to recognize that nuclear weapons can be the tool of their imminent demise and have started to act accordingly. One result has been the lack of any widespread wars since 1945. Douglas McArthur wanted to use the atomic bomb in the Korean conflict, and President Truman nixed the idea. The prospect of a nuclear exchange between the United States and North Korea's patron, the Soviet Union, was obviously on Truman's mind.

Richard Rhodes tells the story with a clarity and with an attention to detail seldom matched. The book is extremely well researched with sources drawn from public records, private notes and declassified files. As much a tale of the construction of a horrible weapon, *The Making of the Atomic Bomb* is a history of science and a revelation of how serious science is done.

It's about people who have already won a Nobel Prize getting dirty and carrying blocks of sooty graphite and packages of uranium compound into the lab. It's (future Nobel winner) Luis Alvarez first learning of induced fission while reading the *San Francisco Chronicle* in a barber's chair and rushing off to his lab, with an unfinished hair cut. It's General Groves putting a tail on Robert Oppenheimer and learning that the married director of the Manhattan Project science team spent the night with an ex-girlfriend, who was an avowed communist.

Rhodes brought the science and the sacrifice down to human terms. Reading this classic we can come to know of these scientists as people and to appreciate the personal sacrifices they wrestled with to pull off this tremendous accomplishment in a time of national urgency.

The book also emphasizes a critical lesson. Science shows us the world is how it is, not how we wish it to be. The scientists could not keep the principles of nuclear energy a secret from society, even had they wished to. The facts had always been there for them or for anybody who came after to reveal. The

genie had not been trapped within a bottle, because the bottle never had a lid on it.



*John Blanton is Web Master and former President of NTS*

## Challenge activity

by John Blanton

The people who underwrite the North Texas Skeptics Paranormal Challenge get some interesting communications. We received an e-mail from Kariei Robinson:

.. I would like to take you up on your challenge as a telepathic... I can send messages and thoughts...similar to voice overs and I work with N.a.s.a.... I have about 4/6 ratio .. after dealing with a guy ..who is somewhat renown.. his name is john benneth and I believe i can perform the task formerly in front of you and your team for the 12,000.

I don't edit these mails, and a common thread that runs through them seems to be a shortage of communication skills.

Anyhow, Kariei Robinson claims to be able to project her thoughts into *my* head. An obvious dilemma arises. Since I encourage claimants to design their own tests, there is this recurring problem—people who make these claims often have no clue about how to devise a suitable test. As this test is supposed to work, Kariei Robinson will have no way of knowing whether her test was successful. She will project to my head. I will concentrate really hard. Then we will show our stuff. Does this sound familiar:

I'm thinking of a number from 1 to 100. What is it?

34

No, it's 78. Want to try again?

In a real test I would require that Kariei Robinson write down what she is projecting, and I would write down what I receive (while concentrating really hard). She will show her paper, then I will show mine. With my money on the line it will not be the other way around.

We went through a similar exercise a few months back with Raymond Powell. First he wanted to meet up with us (he was in Tennessee). I convinced him that if he could do the test remotely it could possibly save him some time and expense if

he tried it that way first. On an NTS meeting day Raymond phoned, and we started the test.

Raymond projected with great vigor, and I concentrated really hard. Raymond told me what he was projecting, and it was not even close to what I had received. I considered that Raymond did not have much talent in the area of his special expertise.

Anyhow, as claimants sometimes do in such situations, Raymond became abusive, and it appears we are no longer on Raymond's Christmas card list.

Hopefully we will fare better with Kariei Robinson. She has agreed to come to San Antonio, and project into my head from a closer range. Maybe at this distance Kariei Robinson will have more success than Raymond Powell did. Details to follow.

Correspondence related to the NTS Paranormal Challenge is posted on our Web site and sometimes printed in our newsletter.



## New look

This is something you should not notice.

Starting this month the newsletter of the North Texas Skeptics is being rendered by a new tool. For over 20 years we have used Ventura Publisher by Corel, but times have changed.

Many of us have migrated to 64-bit computers and Windows 7 (sorry, Mac), and Ventura is no longer supported. To keep up with a changing world we have acquired Serif PagePlus X5.

With PagePlus you will likely not see any differences in your newsletter. We will print a PDF file from PagePlus, and that file will be printed to hard copy to produce the tangible newsletter that many of you receive. Those who receive the newsletter by e-mail will get the PDF. Actually, the PDF will be posted to our Web site, and readers will receive a link to the PDF. Almost simultaneously we will produce a Web page with the major newsletter content and post that to the Web site. Readers can take their choice. Reading from the Web saves the cost of printing and mailing a newsletter.

Katy LaVallee and Ben Davis have volunteered to produce the Web page on a monthly basis. In their real lives they do this kind of thing for a living, so we may expect to see a little more professionalism in the future.

Katy says she intends to stick to the current Web page format for the time being, but Katy and Ben have been given the opportunity to spruce up the Web representation. You may see a new look in the future and maybe the use of additional Web technology.

As always, we seek readers' feedback. The Web master's e-mail is [skeptic75287@yahoo.com](mailto:skeptic75287@yahoo.com), and the NTS hotline is 214-335-9248. Letters from readers are always welcome, and some will be published.




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## Moving forward

By John Blanton

**I**n case we forgot to mention this before, the NTS is run by people who show up.

In January the NTS held its annual election of board member and corporate officers (we are incorporated). Jamey Johnston, who is fairly new to the NTS, and Roy Auerbach, who has been attending meetings for some time, were also elected to the board. Jamey was elected as the new president.

New people in leadership positions immediately set upon a course of activism for the NTS, something that has been needed for some time. If you have not noticed, NTS activities for the next few months are now posted on the Meetup Web site. See the front page of our Web site for the link to our Meetup activities.

The Meetup postings include our monthly program meetings and our board meetings and social dinners. Other activities are included, as well. In February Jamey Johnston hosted a session on Skeptical Bones at the Feynman Library in Irving:

Bob and I would love to have folks over to play bones. We're willing to teach anyone how to play 42 or Mahjong that would like to come, we need to split people into teams of 4. It would be a BYOB event and we only have 3-4 dominoes sets and 1 Mahjong set, so we might need more depending on interest.

Coming up on 23 March you are invited to attend a speech by Bill Nye, the science guy at the University of Texas at Arlington. Follow the postings on Meetup and come out to meet the Skeptics and enjoy the fun.



## Letter from a reader

Greetings from Panama

Hello NT Skeptics! Just came across your website, and you won't believe the racket that ensues over here when browsing the "Challenge Activity"!! Hahaha. Dunno which is funnier, the outlandish claims or your clever quips. Hard to single out a specific case but the best parts are definitely:

I have heard nothing more from\_\_\_\_\_.

Keep skepticism alive :)

Alex Robles

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## Some Current Skeptical News With Views

by Prasad Golla

### On the continuing search front

Looking for masses of stuff in the habitable zones around suns (stars, whichever you prefer) has been an endeavor of scientists for a few decades now. In the habitable zone around a given star the climate is just right – not too hot and not too cold depending on the proximity of this body to its sun. Also to make sure liquid water can exist on that body. That's assuming that life as we know it on our planet, or any other kind, warrants that the conditions must be like on earth. The Kepler space telescope has made some recent discoveries which almost doubles the known planets. That is assuming any of them exist at all. There are no pictures of any of them; for they exist only as secondary observations like the wobbles of suns around which they revolve, etc. The count stands at 1,200 "known" planets according to this article. No sooner we will be counting them in millions.

<http://www.time.com/time/health/article/0,8599,2045835,00.html?hpt=C1>

### Americans exonerate a Japanese Company (Toyota exonerated)

Uncontrollable acceleration of Toyota cars may have been an urban myth formed in a grand scale right under our noses in just the last few years. People believed the handful of accidents happened because of faulty electronic systems in

Skeptic Ink – by Prasad Golla and John Blanton. © 2011. Free, non-commercial reuse permitted.



cars manufactured by Toyota. A team of US led investigators has exonerated Toyota after 8 months of testing. But Toyota is still not totally off the hook. Sticky pedals and improperly installed floor mats may be to blame. On their part Toyota has previously recalled a lot of their cars for these faults. But there is something that they may not be able to help: drivers' errors. Pressing the accelerator rather than the brakes for example. I always thought placing the brake right next to the accelerator in cars is a design flaw.

[http://money.cnn.com/2011/02/08/autos/nhtsa\\_nasa\\_toyota\\_final\\_report/index.htm?hpt=T2](http://money.cnn.com/2011/02/08/autos/nhtsa_nasa_toyota_final_report/index.htm?hpt=T2)

### Cohabitation of Elephant-like creatures and Man

In the Mexican state of Sonora the finding last month of three Clovis projectile heads in the same sediment where the remains of gomphotheres were found, points to these elephant like creatures, previously thought extinct 30,000 years ago. They may have been driven to extinction by the arrival of man in these regions around 12,000 years ago.

[http://www.artdaily.org/index.asp?int\\_sec=2&int\\_new=44345](http://www.artdaily.org/index.asp?int_sec=2&int_new=44345)

In an unrelated story a tomb painting in Egypt points to the speculation that the ancient Egyptians knew about the pygmy woolly mammoths (*Mammuthus primigenius*). That places them at extinction 3700 years ago, and not about 10,000 years ago as previously thought. Although there is much speculation as to whether the tomb painting really represents a pygmy woolly mammoth, this suggestion, if true, reveals interesting conclusions. Two such conclusions would be that Egyptians traded with people who brought these creatures from Siberia (Wrangel Island shows indications these mammoths survived until recently) or that there is another island or region in the Mediterranean where these creatures survived until recently.

[http://scienceblogs.com/tetrapodzoology/2011/01/ancient\\_egyptian\\_pygmy\\_mammoth.php](http://scienceblogs.com/tetrapodzoology/2011/01/ancient_egyptian_pygmy_mammoth.php)

### Surveys that can leave one baffled

A survey finds that 61% have deluded themselves that they haven't cursed at their computer. (My personal experience shows that they usually yell at their monitors, not the actual box that houses their CPU). Makes me wonder if people who have never used a computer are generally more honest, or less.

<http://www.networkworld.com/community/blog/only-39-are-honest-about-cursing-computers-su>

Talking of surveys...

### Continuing crisis

Another survey – conducted by Penn State Political scientists Michael Berkman and Eric Plutzer of 926 high school biology teachers – finds that only 28 percent of high school science teachers consistently follow National Research Council guidelines encouraging them to present students with evidence of evolution. Thirteen percent "explicitly advocate creationism or intelligent design ..."

Writing in the Jan. 28 issue of Science magazine, they report that most science teachers - 60 percent - cheat controversy by such stratagems as telling students it does not matter if they "believe" in evolution, so long as they understand enough to pass a test. Or they teach evolution on a par with creationism and encouraging students to make up their own minds.

<http://tinyurl.com/63jbg89>



Next time meet us in another round of viewing the news through skeptical lenses. We believe there is no other way of viewing the news or the world.

Send in your weird skeptical news to Prasad Golla at [golla@ieee.org](mailto:golla@ieee.org).

North Texas Skeptics  
P. O. Box 111794  
Carrollton, Texas 75011-1794

**FIRST CLASS**

Address Correction Requested

.....  
**Application for Membership**

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Occupation \_\_\_\_\_  
Special expertise and/or interests \_\_\_\_\_

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

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Yes, I agree with your purposes in exploring paranormal and pseudoscientific claims from a responsible and scientific point of view, and while I do not endorse the a priori rejection of paranormal phenomena and pseudoscientific claims, I believe that such claims must be subjected to the fair and systematic testing which rational enquiry demands.

Signature \_\_\_\_\_ Date \_\_\_\_\_

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[www.ntskeptics.org](http://www.ntskeptics.org)