

The REALL News

The official newsletter of the Rational Examination Association of Lincoln Land

"It's a very dangerous thing to believe in nonsense." — James Randi

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August 2000

Don't You Believe It! **Scientists Report: Bumblebees Can't Fly** by Robert Novella

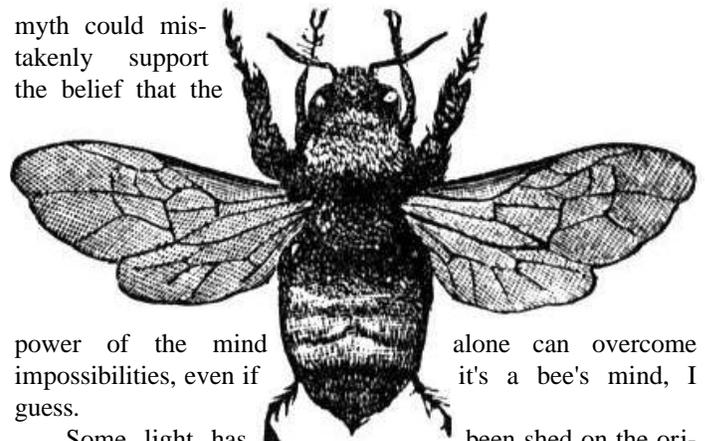
The worst misconceptions are those which everyone knows to be true, and yet are completely false. Once false ideas get into the public consciousness, however, they are very difficult to expunge, and rarely go away completely. This article examines one of the most common myths and misconceptions in our society.

When I was in High School we had school meetings every Friday during which we would discuss current events, see movies, listen to speakers, etc. One morning we listened to an accomplished disabled man who started his speech by describing how science has proven that bumblebees cannot fly. He continued by saying that the bumblebee did not know this, however, and therefore is able to fly. His point was, of course, that disabled people could transcend the limitations and expectations society places on them by hard work and perseverance. I wholeheartedly agree with this attitude but the bumblebee example he used is not only erroneous, it illustrates one of the pervasive myths in our culture that are accepted without much scrutiny and rarely questioned.

Often this bumblebee story is used to discredit scientific conclusions about the impossible nature of supernatural events or feats. For example, if someone claims to know a successful dowser and that science and experiments show this to be impossible, the advocate might say that his friend is like the bumblebee in that he doesn't know that science says his feats are impossible. Or he might say, "What does science know, science tells us that bumblebees can't fly."

This myth can lead the way to one of several different beliefs. One of these beliefs is that people can transcend their physical limitations and achieve the impossible regardless of what science tells us. The high school speaker mentioned above really seemed to believe this. Although he drew strength and inspiration from this it seems inevitable that unrealistic expectations would be created that can only lead to disappointment. Most importantly, one can derive from the bumblebee myth the pernicious belief that science is an unreliable and overrated enterprise. After all, bees obviously fly and anything that concludes otherwise is at best flawed and at worst a complete waste of time. One other possible interpretation of this

myth could mistakenly support the belief that the



power of the mind impossibilities, even if guess.

alone can overcome it's a bee's mind, I

Some light has been shed on the origin of the bumblebee myth by author and aerodynamicist J.H. McMasters. (Zetie, 1996) He states that it all started in German technical universities in the 1930s. Apparently, a famous and unnamed Swiss aerodynamics expert was having dinner with a biologist when the latter asked a question regarding the flying abilities of bees. A preliminary calculation showed that there was insufficient lift to allow bees to fly. Only about one third to one half of the required lift could be generated. The biologist started spreading the word about scientific "proof" that bees can't fly and somehow the media got hold of the information. Today, decades later it is a ubiquitous myth that is rarely questioned and is often used to disparage science. The implication, of course, is that if "science" (as an abstract entity) claims that bumblebees cannot fly, when they clearly do fly, then "science" is bunk. The findings of science can therefore be comfortably disregarded as esoteric and irrelevant.

The issue seems cut and dried. Either science can account for the flight of bees, or it cannot. What's the problem? The problem lies in the difference between insect flight and airplane flight. Conventional aerodynamics, the kind developed for airplanes and helicopters, focus on "steady state" situations.

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Purpose

The Rational Examination Association of Lincoln Land is a non-profit, tax-exempt 501(c)(3) educational and scientific organization. It is dedicated to the development of rational thinking and the application of the scientific method toward claims of the paranormal and fringe-science phenomena.

REALL shall conduct research, convene meetings, publish a newsletter, and disseminate information to its members and the general public. Its primary geographic region of coverage is central Illinois.

REALL subscribes to the premise that the scientific method is the most reliable and self-correcting system for obtaining knowledge about the world and universe. REALL does not reject paranormal claims on *a priori* grounds, but rather is committed to objective, though critical, inquiry.

The REALL News is its official newsletter.

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From the Editor

Wally Hartshorn

This issue of The REALL News features an article from the New England Journal of Skepticism, the newsletter of the New England Skeptical Society (NESS). I've always admired the NESS simply because they have a very cool acronym for their group! However, they also have some very nice articles in their newsletter, as this one by Robert Novella demonstrates. Read his article so that the next time someone at a garden party tells you confidently that science has proven that bumblebees can't fly, you'll be ready with a more eloquent response than "uh, I'm not sure whether that's true."

Our other feature article is another installment in David Bloomberg's series, "Fighting Ignorance with The Straight Dope." In this month's episode, David response to three letter writers who have questions about three conspiracy theories, including the technological, the theological, and the cryptozoological – all of them illogical.

That's all for this month! (Quick plug for my new web site – www.skepticplanet.com. Go see it. End of plug.)

A Nod to Our Patrons

REALL would like to thank our patron members. Through their extra generosity, REALL is able to continue to grow as a force for critical thinking in Central Illinois. To become a patron member of REALL, please use the membership form insert. Patron members are:

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From the Chairman David Bloomberg

As I mentioned last month, we will be holding our delayed **Skeptic Jeopardy** game on Tuesday, August 1, at 7:00 in the Lincoln Library. We're back to our regular meeting time, so I hope to see a lot of you joining the fun! We'll probably even have some refreshments.

Other than the meeting, there's not a whole lot to discuss right now. I took a vacation in July, and so I've been playing a lot of catch-up since I got back. This means no "REALLity Check" column this month, even though my folder is still overflowing. But I expect it to return next month. Remember that this year's "REALLity Checklist" year in review will be determined by the members. If you have seen something that you think deserves consideration as the "best" or "worst" in a category, please let me know.

I'll leave the rest of the space I normally use here for articles. See you at the meeting! ♡

("Don't You Believe It!" continued from page 1)

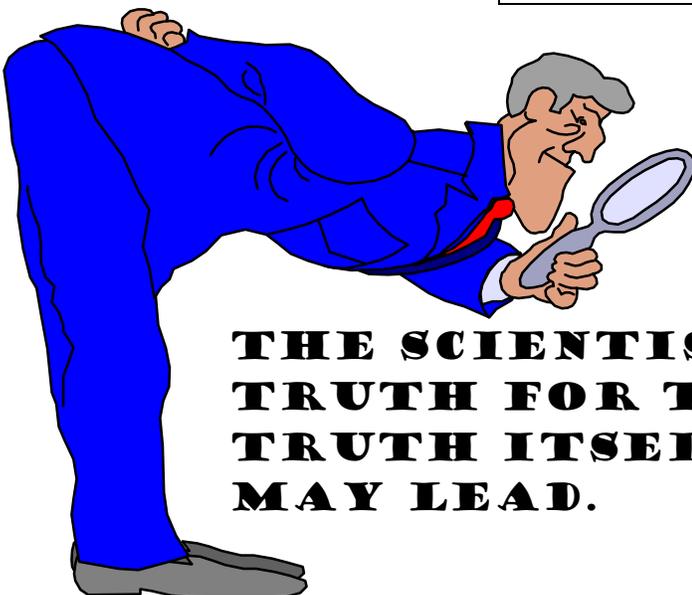
This refers to fixed wings or a rotating propeller. The motion of insect wings, in contrast, is very different, involving complicated 3-D movements and rotations. Other differences were also ignored, including the size of the insects themselves. At the scale of bees the medium through which they fly (air) becomes more important for aerodynamics considerations. To bees, the air seems much more viscous than it does to us, almost like molasses. Aerodynamicists ignored all of these concerns primarily because it was not believed that insects could generate any exotic forms of life. Charles Ellington, a zoologist from the University of Cambridge, has this to say: "Since the 1950s, we've been looking at insect flight with the wrong picture in mind." (Brookes, 1997)

Modern jet planes flying at 1500 miles per hour rely on similar principles of aerodynamics as the Wright brothers' plane did at Kitty Hawk almost a century ago. The wings on both types of planes have a very special shape, called an airfoil, which is curved more on the top than the bottom. When an air stream meets the airfoil it splits into two separate air streams. Because the top air stream has a longer distance to travel (due to the curvature) it moves faster. Faster moving air exerts less pressure than slower moving air (by Bernoulli's principle) and this is considered a key component to air life. It is this pressure difference that produces the lift necessary to keep airplanes in the sky. (To be fair, there is some disagreement about the relative contribution of the airfoil to overall lift compared to other lifting forces like the downward flow of air off the wing.) Think of sipping a soda using a straw. When you suck some of the air out of the straw you are lowering the air pressure in the straw which causes the higher pressure elsewhere to push the soda into your mouth.

When science "proved" that insects can't fly the only thing is really proved was that insects with smooth and rigid wings could not glide (Zetie, 1996). Experiments have actually been carried out demonstrating that this is indeed true. Clearly, conventional aerodynamics was not formulated to account for small insects with a small wing size. Once this was recognized, however, research began uncovering startling new aerodynamic oddities of insect flight that produce previously unknown sources of lift.

One of the most significant discoveries involves the rotation of the wings during flight. Michael Dickinson of the University of California discovered in his studies of flying insects that their brains were inordinately concerned with the minutiae of wing rotations. Hoping to reveal new insights into aerodynamic lift, Dickinson took a close look at wing rotations and noticed that it primarily occurred at the end of each wing stroke. To further analyze his findings he created a scaled-up version of a fruit fly's

("Don't You Believe It!" continued on page 7)



**THE SCIENTIST IS A LOVER OF
TRUTH FOR THE VERY LOVE OF
TRUTH ITSELF, WHEREVER IT
MAY LEAD.**

- LUTHER BURBANK

Fighting Ignorance with The Straight Dope, Part 3

Conspiracies

by David Bloomberg

For those of you who did not see the first two installments of this recurring column, I write for the Mailbag portion of *The Straight Dope* by Cecil Adams. This is a question-and-answer column that runs mostly in alternative independent newspapers across the country (though not in Springfield). You can read it on the web at www.straightdope.com, which is where the Mailbag answers run, and buy his collections in book form at pretty much any book store.

Since a number of the Mailbag answers I have written are also related to REALL, we reprint some here from time to time. This month, we have a few questions related to conspiracies: Was the moon landing a hoax? What's the story with the *Protocols of the Elders of Zion*? Is there a mysterious beast sucking the blood of goats in Puerto Rico (and being covered up by the government)?

As before, Ed Zotti, Cecil's editor, did some editing on these answers.

Dear Straight Dope:

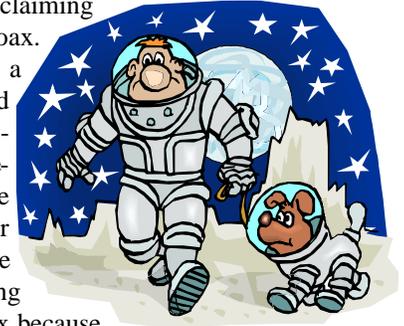
I was reading an online story about the anniversary of the first Apollo moon landing and it mentioned that a very few folks maintain, nay obsessively insist, that it never happened. That none of the moon landings ever took place, except for on a movie set or in the Nevada desert. It sounds to me like the talk of someone who has a wee bit too much time on their hands. What's the Straight Dope - did Armstrong and company walk on the moon or no? -- Matt Schutte

Yes, they walked on the moon. And yes, some people insist they did not – that it was all a huge conspiracy. You seem shocked at this, but remember, there are still folks maintaining that the Earth is flat or only 6,000 years old. (In fact, the flat-Earthers are one of the groups claiming the moon landing to be a hoax – after all, the astronauts took photos showing a round Earth, and they know that isn't true, so it *must* be a hoax!) You don't actually expect *evidence* to convince people like this, do you? Of course not! Any piece of evidence that we could present would simply be, to them, a part of the conspiracy. After all, any good conspiracist can incorporate any piece of information into the big conspiracy without even blinking.

There have been several books written to promote this claim, and more articles. There was even a movie with a similar plot, *Capricorn One*, starring O.J. Simpson, among others (1977). The difference was that in the movie, the fake landing was for Mars, not the moon. One group of flat-Earthers actually claims O.J. was framed by the government for exposing the fake moon landings through his part in this movie! As Peter Huston, the writer and skeptic who mentioned this to me, deadpanned, "Apparently, the government moves slowly on framing its enemies."

Bob Mulford, of the Inquiring Skeptics of Upper New York, wrote a short article for their newsletter, *The WHY-Files*, discussing a recent book claiming the whole thing was a hoax.

Apparently a reviewer in a technical magazine aimed at radio astronomers actually gave the book a more-or-less positive review! He noted that the reviewer bought into one of the author's arguments saying that it was obviously a hoax because of the photos brought back by the astronauts showing their footprints in the moon's soil. The author claimed (and reviewer apparently agreed) that dry sand doesn't leave footprints, and since we all know there is no water on the moon, that proves these photographs must have been faked on a movie set here on Earth.



Mulford points out in his article that the Moon's surface is not covered with beach sand. He notes: "On the earth, sand comes from rocks ground to small pieces by the ocean, or from rocks that were weathered by freezing water. In fact, a little thought shows we should not expect the Moon to be like an desert on the Earth. The astronauts reported that the Moon was covered by an extremely fine soil which compacted easily. They likened it to talcum powder. This soil was produced by a rain of micro meteorites that the Earth's surface is protected from by our atmosphere. It is easy to do an experiment that shows that this type of surface would leave nice footprints. I didn't have any talcum powder, but I did recently produce a large pile of fine dust from sanding spackling compound used to patch a plaster wall. It leaves nice footprints." Mulford adds: "Incidentally, if the Moon walks actually were a hoax carried out in an earthly landscape that looked like the Moon, it would have been done in a dry desert and we wouldn't see footprints in the photos." In other words, the author of that book provided evidence against *himself* rather than proving the moon landing was a hoax!

In 1994, the *Fortean Times* had an article calling the moon landing into question. The article began, "The idea that we went to the Moon - and that we were successful in our Apollo endeavors - is so firmly embedded in the cultural lives of most people on this planet, that to voice the opinion that this might be untrue smacks of paranoia..." Well, I certainly can't argue with that! The article goes on to claim, "In actual fact, mankind has no proof at all that we ever set foot on the Moon, other than the photographs that NASA has elected to publish." Which is simply untrue. We have the photos, the video, the audio, the testimony of all the men and women who worked on the various projects, the samples brought back, etc. His "evidence" of a conspiracy is from the photos themselves, and

calling it “flimsy” gives it too much weight. For example, in the first photo he uses, he supposedly analyzes the shadows, claiming to show that they are facing in different directions, meaning it was done with a very nearby light source. Except when I look at the same photo, I cannot begin to imagine what this guy is going on about – even with the arrows he has kindly inserted to point this stuff out! In several of the other photos, his claims are simply wrong – he puts in arrows to “show” how things should be, but he doesn’t line them up properly.

To their credit, a number of readers responded and said the article was full of baloney, to put it nicely. They pointed out that the author didn’t make allowances for 3-dimensional objects casting shadows on a 3-dimensional ground, that he didn’t notice they were using wide-angle lenses in some instances, etc. In fact, the volume of letters was so great (they said it was the biggest response they’d ever had), they did a follow-up article in 1997, explaining some of the same things that were pointed out in the letters they received. Suffice it to say this guy’s claims were thoroughly debunked.

There have been other similar claims, of course, and I’m sure there will continue to be new claims of a moon landing hoax. I recently heard one that included the gem that Stanley Kubrick directed the moon footage for NASA, which was filmed “on location.” Hmmm. If he was on location, wouldn’t that mean they made it to the moon? Whoops! Never mind! I’m looking for rationality in an inherently irrational subject.

And that’s about what it comes down to. There will always be people who claim a conspiracy for just about anything. Facts will be ignored, rational people will be amazed and dismayed.

Dear Straight Dope:

I'd like to know about the history of that infamous forgery "The Protocols of the Learned Elders of Zion." Who wrote it, and more importantly (to me anyways), why is it that so many people, even today, refer to it as fact? That Nazis and their bretheren are knuckleheads is no big surprise, but it seems a lot of otherwise even minded people believe the text is legitimate. Any ideas? --DG, Cambridge, Mass

I don't know that we can really answer why so many believe it, other than to say some people have beliefs that are simply immune to facts--for example, Holocaust deniers. To a rabid anti-Semite it makes no difference that the Protocols have been debunked countless times. I question whether somebody who believes in the Protocols is "otherwise even minded"-simple minded is more like it. The thing is so far out there it defies belief.

The Protocols are the classic statement of the old notion of an international Jewish conspiracy. They purport to be the text of discussions showing how Jews planned to take over the world and enslave non-Jews. They've long been an excuse to persecute Jews and have been promoted by many famous and powerful people, including some in the U.S.

In 1920, Henry Ford started a newspaper for the purpose of attacking Jews and communists. His paper, the *Dearborn*

Independent, "printed every conceivable staple of contemporary anti-Semitism, including the Protocols of the Learned Elders of Zion" (*A Legacy of Hate: Anti-Semitism in America*, by Ernest Volkman, p. 33).

A U.S. Congressman, Hamilton Fish of New York, once used his office to distribute copies of the Protocols. Accused of anti-Semitism, he responded, "It doesn't bother me any. There's been too much Jewism going around anyway." He was defeated in his 1944 re-election bid (*A Legacy of Hate*, p. 42).

Where did the Protocols come from? Benjamin Segel's book (translated and edited by Richard S. Levy), *A Lie and a Libel: The History of the "Protocols of the Elders of Zion"* begins with a likely timeline. According to Segel, the Protocols were most likely fabricated in Paris between 1897 and 1899 under the supervision of the head of the Russian secret police abroad, Pyotr Ivanovich Rachkovsky. The intent was "to strengthen the czar Nicholas II's position by exposing his opponents as allies with those who were part of a massive conspiracy to take over the world" (*Skeptic's Dictionary*, <http://skepdic.com/protocols.html>.)

The first known publication of the Protocols was August 26-September 3, 1903, when they appeared in abbreviated form in the Russian language paper *Znamia* ("The Banner"). In 1905, Sergei Nilus published the "full" version as an appendix to his book *Velikoe v Malom* ("The Great in the Small"). In 1906, another version was published by G. Butmi in his book *Vragi Roda Chelovecheskago* ("Enemies of the Human Race").

In 1917, Nilus, who had already published the Protocols two more times, produced yet another edition, this time attributing them to Theodor Herzl (1860-1904), the founder of modern political Zionism, i.e., Jewish nationalism.

In 1919, anti-communist Russians distributed copies of the Protocols to members of the U.S. cabinet, judiciary, and intelligence agencies. Henry Ford's edition appeared in 1920, as I said, and the document received attention in the British press as well. Thirty-three editions are known to have appeared by 1933.

In 1921, a reporter for the *Times* of London, Philip Graves, found that the Protocols had been plagiarized. As it turned out, there were two sources: *Dialogue between Machiavelli and Montesquieu in Hell*, an 1864 satire of the French ruler Napoleon III by Parisian lawyer Maurice Joly, and *Biarritz*, an 1868 novel by German anti-Semite Hermann Goedsche.

Goedsche is credited with developing the whole “Jewish plan of world conquest” idea. *Biarritz* features a chapter, “In the Jewish Cemetery of Prague,” in which the princes of the twelve tribes of Israel gather at the cemetery to report the progress of their world takeover schemes. As Segel said in *A Lie and a Libel*, “The plot bore such a striking resemblance to the one developed in the *Protocols* that any reasonable person must conclude that *either both were written by the same man or one was plagiarized from the other*” (emphasis in original).

Segel continues: “Thus the world-conquering plans of the Elders of Zion came out of Goedsche’s trashy novel. But the Elders’ political dogmas and schemes, as well as the moral principles that were their foundation, came almost word for

word from the speeches of Machiavelli in Joly's petty satire on Napoleon III."

Graves debunked the Protocols in the first in a long series of refutations. Among others, a South African court ruled them a forgery and a Swiss court declared them a fraud.

Faced with the facts, some early promoters of the Protocols repented. Henry Ford published the Protocols along with his other anti-Semitic articles in a book entitled *The International Jew: The World's Foremost Problem*. But in 1927, he publicly retracted and apologized for the book, claiming his assistants had duped him.

But Ford was the exception. Others continued to publish the Protocols in other countries long after they'd been debunked.

A few even managed to explain away the evidence of plagiarism. Segel relates that Lord Alfred Douglas, an anti-Semitic leader in London, said that Joly was actually a Jew originally named Moses Joel, who interwove the *real* Jewish plan for world conquest into his satire. This meant that showing the *Protocols* were extremely similar to his satire proved nothing – of course they were, because they both were talking about the same real event!

The truth is, the Protocols were a useful weapon against the Jews, and those who propagated them in all likelihood didn't care if they were true or not. In 1933, excerpts were read at the Romanian parliament by Fascists as a reason to expel Jews from the country. Hitler cited them in *Mein Kampf* and again when castigating the Jews as warmongers in 1939. Franco cited the Protocols in his denunciations of the Jews as well.

You'd think the Protocols might have been put to rest after World War II and the Holocaust, but no. Communists in the Soviet Union used the Protocols to stir up anti-Jewish sentiment, and they continued to be circulated around the world. Segel's timeline continues all the way up to 1994 (his book was published in 1995), when an Australian edition was produced by Christian fundamentalists.

Web users can still find people promoting this hoax as if it were real. For example, a site called "Radio Islam" (abbc.com/islam/english/toread/pr-zion.htm) talks about the Jewish conspiracy against the Muslims, citing the Protocols as "evidence."

Refutations of the Protocols have also continued. A Russian court in 1993 ruled the Protocols an anti-Semitic forgery. (See <http://www.nizkor.org/ftp.cgi?documents/protocols/protocols.001>.) But judicial rulings don't faze the believers – to them it just shows how the Jews have taken over the courts.

The Protocols are part of a centuries-old tradition of anti-Semitism. Dr. Daniel Keren, in an essay on the topic (www.nizkor.org/ftp.cgi?documents/protocols/protocols.zion), notes that the hoax "draws on popular anti-Semitic notions which have their roots in medieval Europe from the time of the Crusades. The libels that the Jews used blood of Christian children

for the Feast of Passover, poisoned the wells and spread the plague were pretexts for the wholesale destruction of Jewish communities throughout Europe." Indeed, the Protocols were used by the Czarist Russians to justify pogroms against the Jews, by Nazis and Fascists to justify their attacks on Jews, and by Communist Russia to justify its anti-Semitism. As Rabbi Joseph Teluskin is quoted as saying, "Thousands, perhaps even tens of thousands, of Jews have died because of this infamous forgery."

So there you have it. The Protocols are a hoax, and anyone with half a brain knows it. They persist not because they're true, but because they're useful.

Incidentally, the History Channel aired a show about the Protocols called "A Deadly Deception" on May 11, 1999, as part of a series on hoaxes. If you're interested, you can buy it at <http://store.aetv.com/cgi-bin/ae.storefront/0/Ext/OutsideFrame/UT/32/Product/42367>. This is not a plug – I haven't seen the show and don't know whether it's worth the money or not.

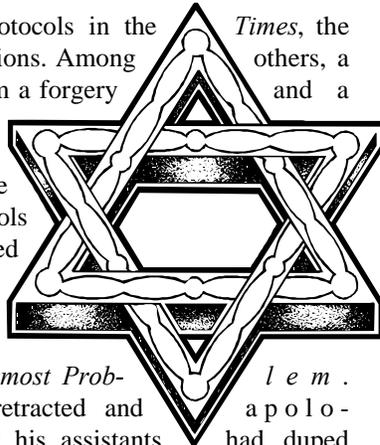
Dear Straight Dope:

I have heard reports of a reptile-like creature called chupacabras amidst the coast of Puerto Rico. Some claim this creature is capable of sucking the blood out of mammals and birds. Is there any truth behind this mystery? — Virilo Massott-Arias

There is almost certainly as much truth behind chupacabra (Spanish for "goat sucker" – sometimes it has an "s" at the end, sometimes not) as there is for Bigfoot, Yeti, the abominable snowman, vampires, aliens, and Elvis sightings. In fact, all except Elvis have been put forth as an "explanation" at one time or another, by one paranormalist or another. And who knows, maybe the King is in on it too.

According to the Chupacabra Home Page (www.princeton.edu/~accion/chupa.html), "For the non-Puerto Ricans among us, the chupacabra is a creature that is currently rampaging through the island, relieving farm animals of their blood." Scary, eh? It gets worse: "As of yet, the chupacabra has not attacked humans, although no one can say for certain that this will not happen in the future. The origin of its name comes from its earliest attacks, where goats were found with their blood drained and with two peculiar puncture marks on their necks. There have been reports alleging that particular organs were missing from some of the victim's bodies, without any visible way for those organs to have been removed. Sightings have increased as the months go by, fueling paranoia and fear."

Of course, the government (which is probably conspiring to keep this all quiet) doesn't see it that way. The Skeptic's Dictionary (skeptdic.com/chupa.html) says, "Puerto Rican authorities maintain that the deaths are due to attacks from groups of stray dogs or other exotic animals, such as the panther, illegally introduced in the island's territory. The director of Puerto Rico's Department of Agriculture Veterinary Services Division, Hector Garcia, has stated that there is nothing unusual or extraordinary about the cases they've observed." Sure. More likely these guys have agreed to feed the chupacabra farm ani-



mal blood so they can get rides in the mothership.

Descriptions of the creature vary wildly. The Chupacabra Home Page says, "Speculation has placed the chupacabra as a resident of another galaxy or a half-man, half-beast vampire who roams the countryside terrorizing farm animals. Others say that the chupacabra hops like a kangaroo and leaves a sulfur-like stench. Still others say that the chupacabra is a panther-like creature with red eyes and a long snake-like tongue." The Skeptic's Dictionary adds, "Some have seen a small half-alien, half-dinosaur tailless vampire with quills running down its back. Some think it may be a type of dinosaur heretofore unknown. Some are convinced that the wounds on animals whose deaths have been attributed to the chupacabra indicate an alien presence. However, they do not attribute the 'mutilations' to the aliens themselves, but to one of their pets or experiments gone awry." I thought they were kidding about that last part, but they're not. According to the Dictionary, Jorge Martin, a Puerto Rican journalist, says the government has captured a couple of these things, and another has been killed and been analyzed. He suggests that it might be "the product of highly sophisticated genetic manipulations by human agencies." One sketch of the beast can be found at www.princeton.edu/~accion/ccabra.jpg. To me it looks like the Grinch, although the Grinch's eyes are smaller. Maybe it's a Grinch-alien hybrid.

Another description, found at www.princeton.edu/~accion/chupa10.html, says the creatures are somewhat intelligent and can become undetectable. This is logical. If we can't find evidence for them, this proves they can make themselves invisible. The same source says it only drinks the blood of animals, not humans. Um, aren't humans animals?

The claims of bloodless animals and animals with missing organs are similar to the "cattle mutilation" stories favored by the UFO folks--for more, see Cecil Adams' column on this topic (www.straightdope.com/classics/a2_281.html) and the Skeptic's Dictionary (skepdic.com/cattle.html). One aspect of the Skeptic's Dictionary entry that deserves mention in connection with our friend the goat sucker is the description of what happens to blood in a dead body, since one of the main characteristics of the supposed animal victims is a lack of blood: "Blood settles, the heart does not pump when an animal is dead, insects devour the blood that does spill out, etc." In other words, the fact that you don't see blood doesn't mean it's all disappeared or been sucked out of the corpse.

Chupacabra sightings have been reported in Florida and Mexico. Dr. Neftali Olmo-Terron, a psychiatrist in San Juan, Puerto Rico, argues that this shows the whole thing is a myth spreading to different areas (www.princeton.edu/~accion/chupa8.html). However, believers say the creature's apparent spread around the world, unlike a real animal's habitat, proves that it's an alien's pet. Nothing will convince these folks that farm animals aren't having their blood sucked dry by the Grinch.

That reminds me. Time to take a closer look at Dr. Suess. This guy knows too much. ♡

(*"Don't You Believe It!" continued from page 3*)

wings. To simulate the viscosity of air from the fly's point of view Dickinson placed his robotic wings in mineral oil and flapped them slowly. Using sensors attached to his robotic wing he determined that by precisely timing the rotation of its wing, bees could generate 35% extra lift. What Dickinson and other scientists have discovered is that precise wing rotations at the end of a stroke causes the vortices of air on the wings to increase their speed, thereby increasing lift.

A similar discovery by Charles Ellington (mentioned above) attributes previous unknown sources of lift to a phenomenon called delayed stall. This occurs when a wing is at a high angle of attack (close to vertical) and the airstream detaches from the top of the wing forming a leading edge vortex. This vortex causes a low-pressure region on the wing, temporarily increasing lift. Visualize a paper airplane near the end of its flight with the tail end dipping down and its nose pointing close to vertical. There is a brief moment of added lift just before it lands. This is delayed stall (Brookes, 1997, Velasco, 1999) and it is normally a transitory phenomenon because it is so unstable. Ellington, like Dickinson, also created a larger than life mechanical apparatus (this one called Flapper) to better visualize the phenomenon. His results astonished him. During each stroke of his over-sized rob-bug's wing, a leading edge vortex formed but instead of quickly dissipating, it traveled along the outer edge of the wing for most of the entire stroke of the wing. This was never noticed earlier, primarily because the vortex is so tiny. It took something the size of Flapper to make it noticeable.

It seems clear that science has not proven that bumblebees cannot fly. This myth began after attempting to use the equations of aerodynamics, which beautifully describe the flight of manmade objects, to describe the flight of nature's best aerialists, the insects. But when the differences between planes and bees are not accounted for, it leaves one with the feeling that either science knows nothing or there is something magical about insect flight. Neither is true.

Robert Novella is the Vice President and Assistant Editor for the New England Skeptical Society. This article first appeared in the New England Journal of Skepticism, Fall 1999, and is reprinted with permission.

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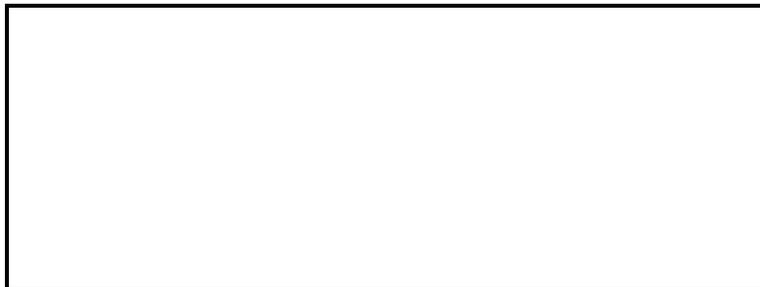


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