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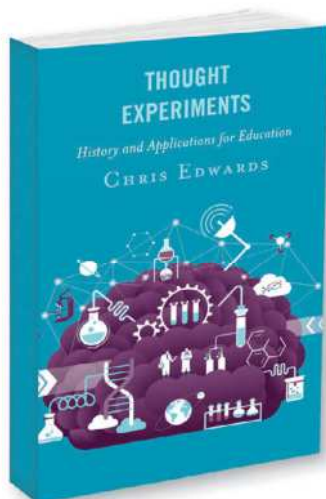
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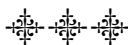
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CONTENTS

COLUMNS

- 4 The SkepDoc**
Dietary Supplements and Deception
BY HARRIET HALL, M.D.

- 6 MetaSkepticism**
When Conspiracists Psychoanalyze
BY MICK WEST

80 Authors & Contributors

COVER ARTICLES: ON UFOS & UAPS (UNIDENTIFIED AERIAL PHENOMENA)

- 12 U.S. Government Says
UFOs are “Real”**
*An Analysis of the 60 Minutes
Investigation*
BY MICK WEST

- 16 Unidentified**
*Are UFOs and UAPs Ordinary,
Extraordinary Terrestrial, or
Extraordinary Extraterrestrial
Phenomena?*
BY MICHAEL SHERMER

ARTICLES

- 8 Anti-Vaccination
in the Age of COVID-19**
*Dangerous Pseudoscience
Doubles Down*
BY RAYMOND BARGLOW
AND MARGRET SCHAEFER

- 34 5G Conspiracy Theories
& Other Popular
Delusions**
BY SEAN KELLY

- 37 The Paradox of Free Will**
BY DENNIS MIDDLEBROOKS

- 38 Inequality: Why Women?**
*A Plausible Sociocultural Explanation
for the Persistence and
Universality of Gender Inequality
Over Thousands of Years*
BY DOLORES NEWTON
AND JEFFERSON M. FISH

- 54 How Science Works
(and Why Pseudoscience
Fails)**
BY STEVE SOBEL

- 58 Pandemic Politics**
*How 2020 Impacted Americans’
Social and Political Attitudes*
BY ANONDAH SAIDE,
KEVIN McCAFFREE,
AND MARSHALL MCCREADY

EXCERPTS

- 25 Thought Experiments**
What Good Are They, Anyway?
BY CHRIS EDWARDS

- 47 Expert Bullshit Detection**
BY JOHN V. PETROCELLI

TRIBUTES

- 64 In Memoriam:**
Pat Linse (1947–2021)
BY MICHAEL SHERMER, DANIEL
LOXTON, DONALD PROTHERO, BRIAN
DALTON, HARRIET HALL, RALPH
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On the cover: painting by Ástor Alexander. The big questions—are we alone? And if not, what does it mean?

The SkepDoc

Dietary Supplements and Deception

BY HARRIET HALL, M.D.



AT LEAST HALF OF AMERICANS (MAYBE as many as two-thirds) take dietary supplements. They assume the government will guarantee safety, efficacy, and truthful advertising. They couldn't be more wrong. The very term dietary supplement is based on a fiction.

While dietary supplements are regulated by the FDA, the regulations are very different from those governing approval of prescription and over-the-counter medicines. Under the ill-conceived Dietary Supplement Health and Education Act of 1994 (DSHEA),¹ dietary supplements are considered to be food, not medicine. They are not intended to diagnose, mitigate, prevent, or cure diseases. But the reality is that they are being used as medicines.

How Did This Happen?

In the late 1980s and early 1990s, Congress was considering legislation that would have increased the powers of the FDA. A proposed amendment to the Federal Food, Drug, and Cosmetic Act would have authorized any U.S. district court to "order the recall of a food, drug, device, or cosmetic which is in violation of the FDCA if the violation involves fraud or presents a significant risk to human or animal health."² The Nutrition Advertising Coordination Act was introduced in the House in 1991 to tighten the regulations governing labeling of supplements.³ Marketers of supplements erupted in protest, claiming that the FDA was trying to ban dietary supplements, which it clearly wasn't. What the proposed legislation actually said was that it:

Amends the Federal Trade Commission Act to deem a food advertisement misleading if it expressly or by implication characterizes the level of any nutrient, the relationship of any nutrient to a disease or a health-related condition, or the amount of any nutrient in a serving or portion of the food, unless the characterization is in accordance with specified provisions of the Federal Food, Drug, and Cosmetic Act. Deems a food advertisement misleading if it contains a claim that fails to: (1) disclose the level of fat or saturated fat when a claim characterizes the level of cholesterol; (2) disclose the level of cholesterol when a claim characterizes the level of saturated fat; (3) disclose the level of total fat when a claim is made that the food is high in dietary fiber; or (4) include clearly and conspicuously the statement, "See product label for complete nutrition information."

The dietary supplement industry misrepresented the provisions and intent of the proposed legislation. They lobbied the government and put out alarmist ads. One deceptive ad featured Mel Gibson being arrested by FDA agents because he had been taking vitamin C supplements. (Absurd! The FDA does not have the power to arrest anyone.) Viewers were led to believe the lie that the government was about to take their vitamins away.

The DSHEA was introduced in 1994 by two senators: Orrin Hatch (R-Utah) and Tom Harkin (D-Iowa). It had bipartisan support in Congress. It passed and was signed into law by President Clinton in October 1994.

Criticism of the DSHEA

DSHEA has been widely criticized and critics have long been calling for its repeal. In an article in *Skeptical Inquirer*, Steven Novella called it "a gift to the supplement industry."⁴ He said, "The result has been an explosion of the supplement industry flooding the marketplace with useless products and false claims." On Quackwatch, Stephen Barrett commented, "Most people think that dietary supplements and herbs are closely regulated to ensure that they are safe, effective, and truthfully advertised. Nothing could be further from the truth."⁵ Even David Kessler, head of the FDA when the bill was passed, complained that:

The 1994 Dietary Supplement Act does not require that dietary supplements (defined broadly to include many substances, such as herbs and amino acids, that have no nutritive value) be shown to be safe or effective before they are marketed. The FDA does not scrutinize a dietary supplement before it enters the marketplace. The agency is permitted to restrict a substance if it poses a 'significant and unreasonable risk' under the conditions of use on the label or as commonly consumed... Congress has shown little interest in protecting consumers from the hazards of dietary supplements, let alone from the fraudulent claims that are made, since its members apparently believe that few of these products place people in real danger. Nor does the public understand how potentially dangerous these products can be.⁶

Novella pointed out that the pharmaceutical industry spends over 18 percent of its revenue on research and development. A typical dietary supplement spends 0 percent. Why would they spend money on research if they can simply “mix blueberries and kale and claim it protects against cancer—all cancer?” Or they can “put some vitamin D into a capsule and make all kinds of specious claims. They’re safe, and they don’t have to show a word of evidence in support of their claims.”

Supplements are not required to show evidence of efficacy and safety before marketing. They are allowed to make structure and function claims like “calcium builds strong bones” or “fiber maintains bowel regularity.” They are required to state in a disclaimer that FDA has not evaluated the claim. The disclaimer must also state that the dietary supplement product is not intended to “diagnose, treat, cure or prevent any disease,” because only a drug can legally make such a claim. However, the required disclaimer usually appears in very small print at the bottom of the page and so is easily ignored or dismissed by consumers.

Supplement manufacturers are supposed to report side effects to the FDA, but often they do not, and they don’t keep accurate records. If a product is found to be harmful, it is left up to the FDA to show the evidence and call for the product to be taken off the market. That rarely happens. When ephedra was found to have caused serious side effects and even the deaths of prominent athletes, the FDA banned the sale of supplements containing ephedrine alkaloids in 2004. The ban was challenged in court but upheld in 2006 by a U.S. Court of Appeals. Today the sale of ephedra alkaloid-containing products is illegal, but it is still legal to sell products containing ephedra extract if they don’t contain ephedrine.

Supplement manufacturers are supposed to follow good manufacturing practices, but they don’t always comply, and products are often found to contain more or less active ingredient than stated on the label (sometimes none at all), or to be contaminated with bacteria or

heavy metals, or even adulterated with undisclosed prescription drugs. When a recent study used DNA barcoding to test herbal supplements, 59 percent of the products they tested had DNA from plant species not listed on the labels.⁷ Toxic levels of lead and other heavy metals have been found in a large percentage of Ayurvedic products.⁸ In 1993 in Belgium, *aristolochia* was substituted for the intended Chinese herb in a weight loss product; 105 patients developed kidney damage, some requiring dialysis or kidney transplants. There have been increasing numbers of ER visits and calls to poison control centers about dietary supplements; serious harm has been reported, sometimes resulting in hospitalizations and even deaths.

When Are Supplements Indicated?

Is the diet deficient in some nutrient? The deficiency should be verified; most deficiencies are easily diagnosed by a doctor through lab tests. The first, most obvious remedy would be to improve the diet, but sometimes supplement pills are needed. Some examples: iron supplements for iron deficiency anemia, folate supplements to prevent neural tube birth defects in pregnancies, B12 supplements for pernicious anemia, etc. Such uses are supported by good evidence from scientific studies.

Evidence Lacking, Regulation Ineffective

Most of the dietary supplements on the market are untested or inadequately tested. More worrisome, some have been tested and found to be ineffective or unsafe, but they are still being sold. Recently, public concern about Covid-19 has been exploited by unscrupulous marketers to sell useless or even harmful products with claims that they are effective for the pandemic coronavirus.

The Federal Trade Commission (FTC) is charged with regulating advertising; the FDA with regulating labeling. Each can issue warning letters, but they lack teeth. Both agencies lack adequate personnel and funding, and can’t possibly respond to all the many violations.

The DSHEA requires a disclaimer that the product is not intended to “diagnose, treat, cure or prevent any disease.” Unfortunately this requirement is often ignored; bogus claims abound. Actually, the sellers don’t have to make claims for their products. Others do that for them. Testimonials report miraculous improvements from all kinds of symptoms. Naturopaths and integrative medicine specialists promote such products. Many dietary supplements are sold through multilevel marketing schemes where distributors are free to say anything to their customers in private interactions: word-of-mouth marketing. And of course, the FDA and FTC can’t control what people say on social media.

Many supplements claim to have evidence of effectiveness from clinical trials. Remember, if a supplement was supported by acceptable evidence, it would qualify for FDA approval and could be classified as a medicine rather than a dietary supplement. Classification as a dietary supplement means it is not supported by good evidence. The studies they cite are often laughable: low quality, poorly designed studies, junk science, studies with equivocal results, studies with no control group, etc. For some products, “clinically proven” seems to mean “we gave free samples to several friends and relatives and got them to agree that it worked.” Strong suggestion and placebo responses are responsible for the positive results of many studies. That’s not enough; to demonstrate that a medicine is effective, we need to show that it can outperform placebos.

Warning: Beware!

Dietary supplements and deception are constant companions. Taking a supplement is a gamble. Skepticism and vigilance are advised. *Caveat emptor.* **S**

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MetaSkepticism

When Conspiracists Psychoanalyze

BY MICK WEST

AS A SKEPTIC, I OFTEN HAVE AN experience that many people will find familiar. I'm talking to someone. They tell me something I know is wrong, and I explain why it is wrong. They refuse to believe me. I continue to try, sometimes over days or weeks. They still won't get it, and sometimes their false belief becomes even stronger. What is wrong with them?

The inability of the true believer to see reason is a frustrating puzzle. One of the most common questions I get in interviews is "why do people fall for conspiracy theories?" I explain that it's often just a chain of chance, circumstances, and being in an unsettled time in their life with too much spare time. But that's not the "why" the interviewer is looking for. They want to know what is *wrong* with the conspiracy theorist. Specifically what is *mentally* wrong with them.

There seems to be a natural desire to pathologize unconventional beliefs. Many of these conspiracy theories seem so wrong that for a lot of people a belief in them can only make sense if there's some kind of mental illness involved. So they ask "what is wrong with them."

Sometimes, of course, there is something wrong with them. Mental illness, specifically paranoia or delusional disorder, can lead to belief in conspiracy theories. In addition, mental quirks such as narcissism or a tendency toward attribution errors (assuming things have deliberate or at least non-random causes) have a statistical correlation with conspiracism.

But many, probably the majority, of conspiracists are essentially ordinary people who just hold some mistaken beliefs. They have been persuaded by deceptive media (usually videos) that a particular event is best explained as being the result of a conspiracy by a small group of powerful people acting for nefarious purposes.

Once they accept this explanation, it can be difficult for them to un-realize it because they have become epistemologically unmoored and have difficulty trusting any source.

This reluctance to accept any contradictory evidence can seem very puzzling to people unfamiliar with the conspiracy world. So it is easy to jump to the conclusion that there's some mental illness there. We pathologize their misunderstanding.

But something I have learned, often by painful experience, is that with conspiracy theorists, there is a *symmetry of perception*. You think they have been misled by YouTube videos, while they think the mainstream media or government has brainwashed you. You are frustrated that they don't listen to reason, they are angry you refuse to listen to Alex Jones.

You think there's something wrong with them. They think there's something wrong with you.

If I interact with a conspiracist for long enough, I often see their perceptions of me go through a trajectory. First, they are friendly, eager to share the knowledge of their theory with me, thinking I'm simply unfamiliar with it. Later they see I continue to be unpersuaded and so conclude that I must be either stupid or a government shill (a misperception with a whole set of problems of its own.)

Good conversation will generally show them I am not stupid. More time and effort will lead them to realize I'm not a government shill and that I genuinely believe what I am saying is correct. Since they know their beliefs to be correct, cognitive dissonance forces them into one remaining logical conclusion: that I am mentally ill or I have psychological factors that prevent me from seeing the truth.

In 2012, over a decade after the events of 9/11/2001, the conspiracy group

"Architects and Engineers for 9/11 Truth" was feeling this cognitive dissonance. Frustrated that their expertise and evidence were not convincing people, they asked psychologists and other mental health professionals to help explain it. Of course, the professionals they chose were the tiny fraction in the field who also thought that the Twin Towers were demolished with pre-planted explosives. So the results were predictable yet still revealing. 9/11 Truth supporter and licensed clinical psychologist Robert Hopper, Ph.D, explained it:

9/11 Truth [the conspiracy theory] challenges some of our most fundamental beliefs about our government and about our country. When beliefs are challenged or when two beliefs are inconsistent, cognitive dissonance is created. 9/11 Truth challenges [our] beliefs that our country protects and keeps us safe and that America is the 'good guy.' When this happens, fear and anxiety are created. In response, our psychological defences kick in [to] protect us from these emotions.

So the reason given for people not believing in their explosive demolition theory is not that it is contrary to the evidence to a ridiculous extent, but rather that our brains are used to being kept safe by the government, and shut down if it is suggested this is not happening.

It is not lost on me that I just accused them of cognitive dissonance, then in the very next paragraph, they said the exact thing about people like me. Their conclusion is just as seemingly valid in their epistemology as it is in mine. Again, there is a symmetry of perception.

Another 9/11 Truth supporter, Psychologist Fran Sure, M.A., had a similar take on people who disagreed with her take on the demolition theory:

What is common to every one of them is the emotion of fear. People are afraid of being ostracized, they're afraid of being alienated, they're afraid of being shunned. They're afraid of feeling helpless and vulnerable, and they're afraid that they won't be able to handle the feelings that are coming up. They're afraid of their lives being inconvenienced... of being confused...[and] of psychological deterioration. They're afraid of feeling helpless and vulnerable.

This way of thinking was gratefully adopted by the rank-and-file followers of conspiracy theories. Finally, they had a way of understanding their friends and relatives who somehow seemed immune to reason and who refused to watch their YouTube videos. They were simply afraid! Rather than the troubling reality that someone might be disagreeing with them based on science and logic, they were able to feel superior, and even take pity on the poor people around them who were too afraid to face their "reality."

This is not restricted to 9/11 Truth. A few years ago, a popular promoter of the "Chemtrails" conspiracy theory described meeting me (paraphrasing):

I met that debunker, Mick West. He was all over the place, he couldn't complete a sentence. He could not look me in the eye. He seemed frantic. I think there was something mentally wrong with him.

I remember that meeting well. It was at a chemtrail conference in Los Angeles. I was the only nonbeliever there that I knew of. At one point I started talking to a small group, and I explained who I was. They grew angry, and surrounded me, asking me how I could live with myself as a government shill. While there was no immediate threat of physical violence, it was a rather nerve-wracking experience. I explained my interest, and eventually had a halfway rational chat with one of them.

Later, I went to talk to the promoter. Still shaken, I hesitated to interrupt his conversation and hovered nearby for a while, uncertain about what to do with myself. When I finally spoke to him, my nerves must have shown. Years later his suspicious mind interpreted my nervous glances as indications of guilt, and my

hesitations to choose the right words as evidence of mental illness.

The lesson I learned from this encounter (and the way he later characterized it) is the age-old one that first impressions matter. This is especially true when the person receiving their first impression of you is apt to interpret every nuance in a particular way that fits their worldview. It can be very difficult, but the impression you want to get across is that you are neutral, friendly, and honest. The simplest way to give that impression is to actually be those things. And try to relax!

More recently, a paragraph in the *New Yorker* about me was gleefully seized upon by UFO enthusiasts who were confused and angry with me for spending so much time debunking UFO videos. In reality, I do that because I enjoy the challenge of figuring out what is often a complex 3D puzzle mixed with fascinating detective work. But what they found instead was:

He used to lie in bed at night, as he wrote in his book, *Escaping the Rabbit Hole*, "literally trembling with the thought that some alien could enter my room and spirit me away to perform experiments on me." Of particular cause for terror was the "Kelly-Hopkinsville encounter," a 1955 case in which a Kentucky farmhouse was said to have come under attack by little green men.

It is true that story frightened me for a few weeks 40 years ago. But my discovery that these old cases often had solutions was actually part of my motivation for turning to debunking. Once you figure one thing out, it's fun to figure out others. But some UFO fans took this story to mean that I have a pathological fear of aliens and that I now spend time debunking them to convince myself they are not real, even though I secretly think they are.

The reality is that my childhood fears are long gone. I don't have nightmares about aliens. In fact, I grew to love the idea of aliens by reading comics like the Silver Surfer or 2000AD, watching films like *E.T.* and *Close Encounters of the Third Kind*, and especially endless reading of science fiction that often involved aliens. Some favorites that still resonate with me: Arthur C. Clarke's *Childhood's End* and *Rendezvous*

with Rama, Larry Niven's *Ringworld*, Philip K. Dick's *Galactic Pot Healer*, and Robert L. Forward's *Dragon's Egg*.

Yet now I see my childhood fears distorted on a weekly basis on social media. Sometimes in the most convoluted ways.

The most hardcore [UFO skeptics] shared something in common and I mean all of them. They used to be hardcore believers. They were ashamed of themselves at one point and became obsessed with debunking UFO cases. [...] You did not get into UFO debunkings earlier on in your life because you felt reassured by the work of other skeptics. You then were too busy with THPS and enjoying the American Dream and I can only thank you and congratulate you for that. Then your love for aviation led you to debunking chemtrails conspiracy theories [...] Then chemtrails naturally led you to your ancient trauma...aliens. so UFOs are the closest thing to aliens

What to do when someone thinks your arguments are founded only on your accidentally recovered "ancient trauma?" The most important thing is to be aware that this is going to happen. If you persist in skeptical investigations or expositions, then some people are going to think you are irrational—and possibly even publicly accuse you of some mental illness or pathological obsession.

Then when this happens, don't get angry—because that will just be interpreted as an irrational denial. Calmly but firmly explain yourself, then move on. Don't give the accusations oxygen or dignify them with any debate. Note that they are false, show some context, and talk about something else.

Above all, understand that these accusations often come from a genuine place. Viewing you as mentally ill might be the only way that makes any sense to them. Try to figure out why that is. What do they believe, and why? What is it about what you are saying that is so incompatible with their worldview that it seems literally crazy? If you can get past any hurt feelings and show them that your thoughts on the topic are actually rational, fact-based, and well-meaning, then the conversation will be a lot more productive. **S**

Anti-Vaccination in the Age of Covid-19

Dangerous Pseudoscience Doubles Down

BY RAYMOND BARGLOW AND MARGRET SCHAEFER

“Governments love pandemics for the same reason they love wars. It gives them the ability to control the population that the population would otherwise never accept.”

— Robert F. Kennedy Jr., speaking to an audience of thousands in Berlin on August 28, 2020

TODAY’S LEADERS OF THE ANTI-VACCINATION MOVEMENT, including Dr. Andrew Wakefield, and Robert F. Kennedy Jr. have been alleging over the past two decades that vaccination is injurious to human health. Now the movement has a new target: vaccines for COVID-19. The development of these vaccines, Kennedy claims, has been driven not by concern for health but by corporations seeking profit and “government totalitarian elites.” On Kennedy’s anti-vaccination website, “herd immunity” is dismissed as a “dishonest marketing gimmick.”¹ This anti-vaccination messaging has not yet had much impact, since demand for COVID-19 vaccination so far this year has been outrunning supply. But that could change when the amount of available vaccine increases to the point that vaccination becomes available to everyone.

Should that happen, the path to herd immunity may hit a major obstacle: large numbers of people who decline to be inoculated. In early March of this year, an NPR/PBS/Marist poll² found that 32% of adults in the U.S. answered “No” to the question: “If a vaccine for the coronavirus is made available to you, will you choose to be vaccinated or not?” A University of California at Davis survey reported similar results.³ It’s true that public opinion may change as more people get vaccinated, and if over time vaccination becomes a less politically polarizing issue. On the other hand, at least in some states, vaccination rejection is likely to remain substantial.

Resistance to COVID-19 vaccination is also strong internationally: low rates of vaccine acceptance have been reported in the Middle East, Eastern Europe, Africa, and European countries that include France and Italy.⁴ Regions of sparse or no vaccination may host new COVID-19 variants that

disseminate globally, thereby slowing or halting progress toward herd immunity.

Vaccination is today standard medical practice, and globally 80% of infants are vaccinated during the first year of their lives against some disease. Yet vaccination has always faced resistance based on fear. Edward Jenner pioneered smallpox vaccine in England in 1796 and worked tirelessly to communicate its value to the public. But half a century later in that same country, the Anti Vaccination League and the Anti-Compulsory Vaccination League were still convincing people of vaccination’s dangers. Despite its manifest benefit, smallpox vaccination had to overcome substantial popular opposition worldwide, and it took nearly two centuries to eliminate the disease.

The Anti-Vaccination Movement in California

Here in the United States repudiation of vaccination is well-funded, encouraged by print, television, and social media, and common in every state in the union. Anti-vaccination protesters in California shut down the COVID-19 inoculation center at Dodger Stadium in Los Angeles in January 2021. Hundreds of people in their cars, lined up in a queue at one of the largest vaccination sites in the U.S., had to wait an additional hour to get their shot. Such opposition to vaccination isn’t confined to Southern California. It remains vigorous as well in alternative medicine enclaves such as Marin County and leftist enclaves like Berkeley, which for decades have been centers of vaccination resistance.

Opposition to vaccination became politically influential during the debate in California about vaccination that took place in 2015. An outbreak of

measles in Southern California had attracted public attention to the fact that vaccination rates had dropped well below herd immunity level in some areas of the state. A group of parents joined with legislators to advocate for legislation strengthening California's vaccination requirements. They drafted a bill, SB 277, mandating that school children be vaccinated. The bill disallowed exemption from vaccination on religious or philosophical grounds or because of belief that vaccination is unsafe, although it continued to permit exemption for a medical reason, such as a child's immune-compromised condition or allergy to a vaccine.

The legislative debate about SB 277 lasted for four months, during which the bill was subjected to libertarian, religious, and legal assaults. Anti-vaccination activists organized statewide to spread the word that vaccination is dangerous, and they traveled to the state capitol in Sacramento to hold rallies and press their representatives to defeat the bill. But pro-vaccination families were also well organized, and passionately made a science-based case for tightening up the state's vaccination requirements. (We published an article on this debate in *SKEPTIC* Vol 21 No.1, entitled "Winning the Vaccination War in California."⁵) SB 277 was signed into law in June 2015 and its passage has improved statewide herd immunity for measles and other diseases.

Yet there remain pockets of low vaccination rates throughout the state. At the Berkeley Rose Waldorf School, for instance, only 29% of the 2017-18 kindergarten class enrolled were vaccinated, and at the Marin Waldorf school the figure was 22%, according to state immunization data.⁶ In violation of California law, parents find physicians who are willing to exempt their children on the grounds of contrived medical conditions.⁷

Parents who withhold their children from vaccination replace reliance on public health authority with reliance on vaccination opponents whom they find more persuasive. The dynamic here is based on an essential method humans use to learn about the world—the judgment of people whom we trust. That begins with children's dependence on adults for information and guidance, and extends through years of schooling when teachers assume this instructive role. As a consequence we enter adulthood prepared to believe what those whom we accept as "authorities" tell us is true. Of course, adults have some choice in determining which sources of information they deem credible. But in an age of widespread mistrust of public institutions,

compromised leaders, and a medical system that is dysfunctional in many ways, a charismatic individual can readily capture the attention of many and win a credibility contest against scientists, public health officials, and fact-oriented political leaders.

Charismatic Leaders

Candidates for political office aren't the only ones exploiting this human weakness. In the world of vaccination resistance, Robert F. Kennedy, Jr. is famous not only because of his family name but also for finding fault with vaccination. And his voice is amplified by other vaccination challengers, past and present, with whom many parents have a trusting relation. In the case of California Waldorf school communities mentioned above, respected opinion leaders frighten parents with false claims that vaccination poses a danger to their children. To begin with, there is Rudolf Steiner himself, the founder of the Waldorf school tradition, who is still looked upon today as an esteemed mentor.⁸ Steiner's worldview, "anthroposophy," postulates a spirit world accessible through clairvoyant insight. And that "insight" leads Steiner to pronounce:

Smallpox vaccination has very much to do with the psyche.... If we were to replace this belief with something else, if we were to educate people in a way that is in accord with nature, so that they would be impressed by something other than that we are vaccinating them, let us say by taking them closer to the spirit again, then it would certainly be possible for us to be as effective ...⁹

Thus vaccination, for Steiner, represents secular civilization's impoverished substitute for spiritual enlightenment. This message is conveyed in Waldorf schools by teachers and other school community members whom parents trust. Among them in Northern California where we live is Jennifer Schmid, a nurse who sells food supplements online and whose three children attended a Waldorf school in Silicon Valley. Her podcasts and blog reach a nationwide audience that is much larger, however, than just Waldorf school parents. One of her anti-vaccination postings, she writes, "has gotten over 21,000 hits and 5000 Facebook likes in 3 days.... The feedback for the blog has been overwhelmingly positive." Vaccination science is not credible, Schmid believes, because "all the studies are industry-funded." She writes that the pharmaceutical industry "is going to make billions of dollars on a coronavirus vaccine that will sacrifice safety and effectiveness."¹⁰

Sources of Doubt

Vaccination hesitancy has various rationales and reflects diverse cultural perspectives and values. Someone who is persuaded by the baseless claim of Dr. Andrew Wakefield that “messenger RNA vaccine is actually genetic engineering” repudiates COVID-19 inoculation for a different reason than does a member of the Church of Christian Science or a Muslim who perceives in vaccination a challenge to the will of Allah.

This variety of reasons notwithstanding, we believe that rejection of COVID-19 vaccination has three main sources—two of them pseudoscientific—while the third makes a legitimate critique of health care priorities in the United States and worldwide. (We will not consider here unhinged conspiracy theories about COVID-19 vaccination, e.g., that it is a manipulative plot devised by the CDC, Big Pharma, or Bill Gates, although such ideas are influential on social media platforms.)

1. *Safety and Effectiveness.* Charismatic leaders of the anti-vaccination movement such as Robert Kennedy Jr. allege that vaccination is dangerous and ineffective. Just about every claim that they make in this regard is false.¹¹ Kennedy has said that the Moderna vaccine against COVID-19 is “extremely reactogenic.” But the statistics show that it is not; yes, people “react” to the vaccine, but almost always in harmless ways that just show that it is working as it should. Kennedy argues that vaccine safety has not been confirmed by placebo studies, but this standard scientific protocol was followed in testing the Moderna and Pfizer vaccines, both of which showed a high degree of efficacy against placebos. “There’s no evidence that it [the Moderna vaccine] prevents death,” Kennedy has claimed. On the contrary, testing of the vaccine has shown that it greatly reduces death rates as well as severe COVID-19 symptoms, hospitalization, and the need for ICU care. Despite the absence of evidence for his claims, Kennedy remains a guiding light of the anti-vaccination movement, with more than half a million followers on social media. Their respect for the man, whose tireless advocacy for environmental causes is indeed admirable, contributes to their willingness to accept what he says about vaccination at face value.
2. *Does COVID-19 Vaccination Weaken “Natural” Resistance to Disease?* Some vaccination critics allege that vaccination interferes with the

“natural immunity” that enables the human body to strengthen and heal itself. The idea here is that a vaccine is like a crutch or pill that substitutes for the body’s inherent reparative capacity. The trouble with this analogy is that vaccination does not substitute for the ability of the human body to heal itself. On the contrary, vaccination increases that ability, by educating and strengthening the immune system, helping it to recognize antigens and mobilize its own resources—T cells, B cells, antibodies—to meet future challenges. Vaccination works not like a crutch or pill, but more like an exercise machine: use of a treadmill or elliptical trainer does not dispense with or replace one’s physical capacities but instead strengthens them.

3. *Underlying Causes of Illness.* Vaccination, however effective, is no substitute for attention to the underlying social conditions that contribute to human illness, including lack of access to high quality health care. Many people, especially in economically impoverished communities, suffer and die from infectious diseases because of their life situations. Risk factors include economic poverty and stress, inadequate physical and mental health, and environmental pollution, all of which increase vulnerability to COVID-19. Also implicated are factory farming practices and live animal markets that incubate “zoonotic” human diseases.

Because of point 3 above, responsible public health advocacy must address social and environmental contributions to ill health, including those for the current pandemic. At the same time, though, vaccination remains essential, given that our most effective remedy to COVID-19 will be herd immunity, which vaccination can achieve without the massive and unacceptable loss of life.¹²

Countering Vaccine Misinformation

What can be done to counter vaccine misinformation? Currently the manifest effectiveness of COVID-19 vaccination is the most persuasive argument for its value. And sometimes it is possible to strengthen that argument by directly challenging those who make false or misleading claims. In December 2020, Robert F. Kennedy’s granddaughter, Dr. Kerry Kennedy Meltzer, an internal medicine physician, wrote in a *New York Times* op-ed, “His [RFK’s] concern—that the COVID vaccine is potentially unsafe, and hasn’t been properly tested—is

widespread, and dangerously wrong.”¹³ Others in the Kennedy family have been similarly critical of his anti-vaccination views. There is a risk, though, that even negative attention given to vaccination opponents may help them gain an audience.¹⁴ Here in California, pro-vaccination advocates have focused attention not on countering the false messaging of these critics but on communicating accurate vaccination information to the public. For example, when legislation mandating vaccination of school children was under consideration in California, parents allied with respected authorities to make their case.

Such grassroots support for vaccination is especially important today. In the past, vaccination acceptance has relied on the trust that people have in physicians, nurses, and pharmacists. But recently that reassuring face-to-face contact between health care providers and the public has been attenuated, partly because so much medicine is practiced virtually, as a safeguard against exposure to the virus. This places more responsibility on everyone else. We can counter misinformation not only by electing political representatives who favor pro-vaccination health policies but also by communicating with people in our local communities, where much of the discussion about health matters takes place. Available sources of evidence-based information



California Senator Richard Pan, accompanied by family advocates for vaccination, supports pro-vaccination legislation at a press conference. Credit: Senate Office of Richard Pan

about COVID-19 vaccination include the CDC¹⁵ and the Vaccine Education Center at the Children’s Hospital of Philadelphia.¹⁶

In the race between the mutating virus and the vaccines, Dr. Ashish Jha, Dean of the Brown University School of Public Health, says that “It’s going to be a close call. We are vaccinating really well, that’s the good news. These variants are spreading pretty quickly across the country, that’s the bad news.”¹⁷ Our collective advocacy may determine the outcome of this competition. **S**

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U.S. Government Says UFOs are “Real”

An Analysis of the 60 Minutes Investigation

BY MICK WEST



Journalist Bill Whitaker in the opening UAP segment of 60 Minutes.

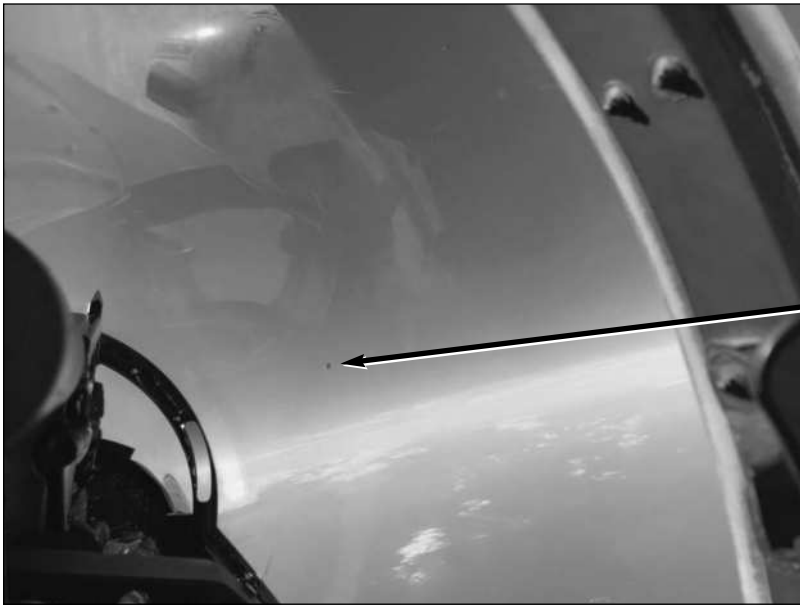


UAP enthusiast Luis Elizondo on 60 Minutes.

THE 60 MINUTES SEGMENT OF SUNDAY MAY 16, 2021 (available online at <https://bit.ly/3wa48Bo>), was no doubt for many people a startling revelation that the U.S. Government has admitted that UFOs are “real” and the military is investigating them. But for me it was a walk down memory lane, a recap of the curious events of the last four years. A disappointing recap at that, as I’d hoped for at least some new nuggets of information that I could use to help solve the rather complicated puzzle of just exactly what is going on.

The segment opens with an interview with a familiar character, Luis Elizondo, reputedly the former head of a \$22 million program instigated by Senator Harry Reid called AATIP: the Advanced Aerospace Threat Identification Program. Ostensibly this was created to study possible future developments in aerospace. Elizondo claims the program was actually created to study UFOs (or, as they prefer to call them now, UAPs, or Unidentified Aerial Phenomena.) Put out to tender in 2008, the budget was awarded to Reid’s friend, Robert Bigelow, a UFO and paranormal enthusiast.

Elizondo opens with the startling claim that “the Government has already stated for the record that [UFOs] are real.” Startling, that is, until you remember that “UFO” does not necessarily mean alien visitors, but rather something unidentified in the sky, something about which the observer lacks sufficient information to identify. Obviously, the government would admit such things are “real.” A mylar balloon (next page, top) floating into the range of a Navy jet’s camera is “real”, but the “U” in UFO and UAP does not mean extraterrestrial, or even necessarily an aerial technology beyond any known physics and aerodynamics.



Left: the view from the cockpit of what looks like a mylar balloon photographed from Navy jet. Right: The enlarged object.



The “Go Fast” video purports to show an incredibly fast craft skimming low over the ocean.

Elizondo then goes on to describe craft exhibiting startling technologies—the ability to accelerate at a physics-defying 600g, reaching speeds of 17,000 mph in the atmosphere, or even through water. These are things that the government very much has *not* admitted are real.

We then are shown a series of familiar videos as evidence of this amazing technology—all of which have been in the public domain for some time (over a decade in one case) and all of which have been analyzed (by several people, myself included) and found almost certainly not to represent

objects exhibiting incredible abilities, and instead more likely signify very ordinary human technology.

First, we see “Go Fast,” a video presented as showing an incredibly fast craft skimming low over the ocean. But if you do the very simple trigonometry invited by the numbers on screen, it turns out to be something *far* above the surface and moving at a speed that matches the wind at that altitude, making it almost certainly just a balloon. Yet the *60 Minutes* host, the highly respected journalist Bill Whitaker, repeats Elizondo’s baseless claim that it’s “fast moving.”



Above: a still from the green flashing triangle video. Below: a night vision device with a triangular aperture.

Next we see a more recent video, the green flashing triangle. Initially very impressive, it shows a triangular shaped object moving across the sky, filmed with a night vision device from a Navy ship. But then you notice the flashing light that, as I demonstrated in a video posted at Metabunk, perfectly matches the pattern of blinking lights on a commercial plane such as a Boeing 737. A little research reveals that some night vision devices have a triangular aperture (see my analysis at Metabunk here: <https://bit.ly/3ePgM2t>). When the device is slightly out of focus a plane flying overhead then looks exactly like this flying triangle. The case was effectively closed when other triangles in the scene were identified as stars. Yet we are told “the Pentagon admits it doesn’t know what in the world it is.” But if the Pentagon has actually studied this at all, then it’s pretty obvious they would agree with me.

In fact, the only thing the Pentagon has admitted is that the videos are “real,” in that they were taken by U.S. Navy personnel (and not, therefore, fake CGI-generated videos or whatever), and that they were included in studies by the UAP task force, meaning they were at least unidentified at one point.

We are then shown two other videos (following page). “FLIR1” is claimed to show physics-defying acceleration, but careful study has shown that the supposed sudden moves are actually the result of the camera moving or changing mode. “GIMBAL” shows an impressive looking flying saucer, but again the



reality seems mundane—an infrared glare of a distant plane and a rotating gimbal mechanism explain both the rotating saucer shape, and why it was named “gimbal” in the first place.

Later we hear about the 2004 USS *Nimitz* aircraft carrier incident, which gave us the FLIR1 video. Two pilots, David Fravor and Alex Dietrich, repeat a story they (mostly Fravor) have been telling for over a decade. Lauded as the greatest UFO encounter of all time, it has remarkably little in terms of actual evidence. The one blurry video has been consistently misinterpreted (including by Fravor) as showing rapid motion. There are accounts of unusual radar returns showing rapid motion, but unfortunately there’s no solid evidence for these, and the account has changed

UFOS AND UAPS

somewhat since it first appeared in a bizarre short science-fiction story written by the chief radar operator in 2008.

Dietrich and Fravor describe an encounter and short dogfight with a “Tic-Tac” shaped craft. This is perhaps the most compelling story, and one that’s difficult to explain. But their accounts don’t exactly line up, and I suspect that they saw the same thing, but both had different illusions of motion based on parallax. Fravor describes a five-minute encounter, yet Dietrich remembers only ten seconds. Unfortunately, the passage of time might mean we will never know what they saw.

We then meet Elizondo’s partner in this enterprise, Christopher Mellon, former Deputy Assistant Secretary of Defense for Intelligence. Mellon seemingly shares Elizondo’s suspicion that we are being visited by some kind of non-human entity, and in 2017 worked with Elizondo to secure the release of the videos, which they then gave to the *New York Times* for a piece of well-timed publicity for their then employer, the To The Stars Academy, founded by rock star Tom DeLonge.

The *60 Minutes* segment is capped by Senator Marco Rubio, who has somehow become embroiled in the UAP saga, presenting himself as the voice of reason, just trying to get the military to look into “this.”

But the military is not ignoring things that fly into their airspace just because they can’t identify them. Procedures exist for reporting and investigating such things—and any unidentified incursion into sensitive military airspace would be aggressively intercepted. And the supposed rationale for AATIP (exploiting UFO technology) has already been covered by a variety of Foreign Material Exploitation Program—likely with vastly higher budgets.

What is going on? I really don’t know. The simplest explanation is that there are UFO fans in government, and they get to do these pet projects because the lumbering bureaucracy has better things to do than question every little \$22 million in the trillion dollar budget. More complicated alternatives involved some kind of military smokescreen, allowing UFO stories to run rampant to distract from real secret programs. But these are speculations. I suspect the people being quoted about the videos have not considered the more mundane explanations I have offered, or considered and rejected them because the “off world” or “extraordinary technology” explanations are more appealing.

Ultimately this story has gone on for far too long because the wall of military secrecy allows rampant speculation and claims based on supposed classified knowledge. The unwillingness of the military to clear this up is perhaps understandable, as they have more important things to do. Unfortunately it’s become a big story, with large segments of the public thinking that there’s something to these accounts and these videos, and it’s a short path from “unidentified” to “extraterrestrial” or “incredible foreign technology.” I do not have any great expectation this story will go away, but I wish that someone high up will eventually say enough is enough, and explain exactly what is going on, what these videos show, and what the military *really* thinks about UFOs. **S**



FLIR1 screen shot.



GIMBAL screen shot.

Unidentified

Are UFOs and UAPs Ordinary, Extraordinary Terrestrial, or Extraordinary Extraterrestrial Phenomena?

BY MICHAEL SHERMER

AN ADVANTAGE OF HAVING WORKED IN THE SKEPTICAL business for 30 years is *institutional memory* that enables me to place the current claims and controversies into historical context, even that of personal memory. So, when the *New York Times* published their article on “The Pentagon’s Mysterious U.F.O. Program” in December of 2017,¹ and CBS’s *60 Minutes* reported that “UFOs Regularly Spotted in Restricted U.S. Airspace” in May of 2021²—the reports bracketing the latest wave of apparent sightings—I forthwith recalled similar such waves in the past, both since the early 1990s when we started publishing *SKEPTIC* magazine and devoting numerous issues to the topic,³ and previous historical upsurges of sightings going all the way back to the 1890s groundswell of “mystery airships” spotted moving across the United States, later identified as dirigibles. Historian Mike Dash’s description of the 1896-1897 series of these mysterious airships will sound familiar to those energized by the latest round of UFO videos:

Not only were [the mystery airships] bigger, faster and more robust than anything then produced by the aviators of the world; they seemed to be able to fly enormous distances, and some were equipped with giant wings.... The files of almost 1,500 newspapers from across the United States have been combed for reports, an astonishing feat of research. The general conclusion of investigators was that a considerable number of the simpler sightings were misidentification of planets and stars, and a large number of the more complex the result of hoaxes and practical jokes. A small residuum remains perplexing.⁴

Residues and Distortions

The final “small residuum” qualification hints at a reality in all skeptical and scientific investigations. No hypothesis or theory in any field accounts for 100 percent of the phenomena under investigation. The “residue problem” means that no matter how comprehensive a theory is there will always be a residue of anomalies for which it cannot account. The most famous case in the history of science is that Newton’s

gravitational theory could not account for the precession of the planet Mercury’s orbit, subsequently explained by Einstein’s general theory of relativity. Darwin’s theory of evolution by means of natural selection could not account for anomalies like the peacock’s large and colorful tail (which would be a bullseye for predators), but his theory of sexual selection did, demonstrating how females select for mates based on certain traits males develop to stand out from other males and to attract females.

The residue problem in UFOlogy is instructive because it enables skeptics to find common ground with believers and allows us to live comfortably with the fact that we can’t explain everything. For example, in her bestselling 2010 book *UFOs: Generals, Pilots and Government Officials Go on the Record*, UFOlogist Leslie Kean notes that “roughly 90 to 95 percent of UFO sightings can be explained” as:

weather balloons, flares, sky lanterns, planes flying in formation, secret military aircraft, birds reflecting the sun, planes reflecting the sun, blimps, helicopters, the planets Venus or Mars, meteors or meteorites, space junk, satellites, swamp gas, spinning eddies, sundogs, ball lightning, ice crystals, reflected light off clouds, lights on the ground or lights reflected on a cockpit window, temperature inversions, hole-punch clouds, and the list goes on!⁵

So the entire extraterrestrial hypothesis for explaining Unidentified Flying Objects and Unidentified Aerial Phenomena (UFOs and UAPs respectively) is based on a residue of data left over after the above list has been exhausted. What’s left? Not much, I’m afraid. Let me close the book on Kean’s book, since she was the co-author of that 2017 *New York Times* article that launched the current frenzy over UFOs and UAPs.

Kean begins by asking readers to consider “with an open and truly skeptical mind” that such sightings represent “a solid, physical phenomenon that appears to be under intelligent control and is capable of speeds, maneuverability, and luminosity beyond current known technology,” that the “U.S.

UFOS AND UAPS

government routinely ignores UFOs and, when pressed, issues false explanations,” and that the “hypothesis that UFOs are of extraterrestrial or interdimensional origin is a rational one and must be taken into account, given the data we have.” She then opens her exploration “on very solid ground, with a Major General’s firsthand chronicle of one of the most vivid and well-documented UFO cases ever”—the UFO wave over Belgium in 1989-1990. Here is Belgian Major General Wilfried De Brouwer’s account of the first night of sightings:

Hundreds of people saw a majestic triangular craft with a span of approximately a hundred and twenty feet and powerful beaming spotlights, moving very slowly without making any significant noise but, in several cases, accelerating to very high speeds.

Compare De Brouwer’s version of events to Kean’s summary of the same incident:

Common sense tells us that if a government had developed huge craft that can hover motionless only a few hundred feet up, and then speed off in the blink of an eye—all without making a sound—such technology would have revolutionized both air travel and modern warfare, and probably physics as well.

Note how de Brouwer’s 120-foot craft becomes “huge” in Kean’s retelling, how “moving very slowly” was changed to “can hover motionless,” how “without making any significant noise” shifted to “without making a sound,” and how “accelerating to very high speeds” was transformed into “speed off in the blink of an eye.” This language transmutation is common in UFO narratives, making it harder for scientists and skeptics to provide natural explanations. Keep this in mind as we consider the latest wave of UAP sightings and videos.

What Does “Real” Mean?

When UFO enthusiasts breathlessly announce that this current surge of sightings was confirmed as “real” by no less an authority than the *New York Times*, the assumption is that the “paper of record” launched an investigation of its own, independent of UFOlogists. That is not what happened. If you check the byline for that and additional articles in that paper, one of the coauthors is none other than Leslie Kean, who as we have seen is anything but a neutral and objective narrator of the UFO phenomena and the government’s response to it. (Kean has since moved on to write a new book and produce a Netflix documentary series called *Surviving Death*, on near-death experiences and the afterlife.⁶) Al-

though co-author Helene Cooper does work for the *New York Times* as a correspondent for Pentagon matters, the other co-author, Ralph Blumenthal left the paper in 2009 and wrote a book titled *The Believer: Alien Encounters, Hard Science, and the Passion of John Mack*, about the late Harvard psychiatrist who uncritically accepted alien abduction stories as accounts of real close encounters of the fourth kind.⁷

This context matters because the word “real”, quoted in nearly all media stories since that 2017 *New York Times* piece, is doing a lot of work here. For example, when *60 Minutes*’ correspondent Bill Whitaker asked Lue Elizondo, who directed the Pentagon’s Advanced Aerospace Threat Identification Program (AATIP), “So what you are telling me is that UFOs, unidentified flying objects, are real?” To which, Elizondo replied: “The government has already stated for the record that they’re real. I’m not telling you that. The United States government is telling you that.”⁸ But no one—not the media, not the military, and certainly not the United States government—is saying that these sightings represent alien visitors. What they are confirming as “real” is the videos themselves as representing something out there in the world, and not a hoaxed CGI production. But when both believers and the general public hear the word “real” their brains tend to autocorrect to “alien” (or “Russian or Chinese assets” if they’re exhibiting a modicum of skepticism), instead of an ordinary effect of cameras and visual illusions or, simply, an unexplained anomaly. Let’s look at the three hypotheses on offer for these UFO/UAP videos: (1) *ordinary terrestrial* (camera/lens effects, visual illusions, balloons, etc.), (2) *extraordinary terrestrial* (Russian or Chinese spy planes or drones capable of feats of physics and aerodynamics unheard of in the U.S.), and (3) *extraordinary extraterrestrial* (alien intelligence).

The Ordinary Terrestrial Hypothesis

The first video in this latest UFO/UAP wave was that of Lt. Cmdr. Alex Dietrich, who reported seeing an unidentified aircraft near San Diego in 2004. Her explanation of what she thinks she saw is prescient of what is likely to come in the report by the Pentagon to be published in the summer of 2021: “Just because I’m saying that we saw this unusual thing in 2004 I am in no way implying that it was extraterrestrial or alien technology or anything like that.” She added, “I think that the report’s going to be a huge letdown. I don’t think that it’s going to reveal any fantastic new insight.”⁹



Figure 1—
FLIR1 image.

The three most widely viewed and discussed videos were filmed by infrared cameras mounted on Navy F/A-18 jets over the Atlantic seaboard and off the coast of Southern California. They were taken by the Navy Advanced Targeting Forward Looking Infrared, or ATFLIR, camera pods attached to the fuselage of the jets, and they are now known as “FLIR1” (San Diego in 2004) and “GIMBAL” and “Go Fast” (Florida coast in 2015).

FLIR1 is Dietrich’s video from 2004 (Figure 1). According to *Popular Mechanics*, it first came to light in 2007 on a UFO website.¹⁰ It landed in public consciousness when it was reposted by the *New York Times* in Leslie Kean’s original article, then reposted in 2019 by the former Blink-182 front man guitarist Tom DeLonge’s UFO organization “To the Stars Academy of Arts and Science.”¹¹ In response, the Navy acknowledged that the videos were “real,” meaning that they are authentic videos and not hoaxes.¹² Finally, in 2020 the Pentagon re-re-posted the three videos “in order to clear up any misconceptions by the public on whether or not the footage that has been circulating was real, or whether or not there is more to the videos.”¹³ So, when people talk about these “new” videos, they are evidently anything but.

The heavy lifting on analyzing these videos from the skeptical community has been conducted by Mick West, a former video game designer, host of the Metabunk.org website and *Tales from the Rabbit Hole* podcast, and a columnist for *SKEPTIC* magazine.¹⁴ It is a remarkable body of work and one hopes the Pentagon’s work is of similar standard,

or that its analysts at least consider West’s explanations as part of their own investigations.

FLIR1 and GIMBAL (Figure 2), says West, are what one would see if a jet were flying away from the camera, thus accounting for the eyewitness accounts that the object showed no directional control surfaces or exhaust. And their apparent saucer-like and “Tic-Tac” shape, West continues, are due to glare on the lens of the camera. As he told the *San Diego Union-Tribune* reporter Andrew Dyer, “What we’re seeing in the distance is essentially just the glare of a hot object,” most likely that “of an engine—maybe a pair of engines with an F/A-18—something like that.”¹⁵

In the FLIR1 video the object appears to zoom almost instantly off the screen, interpreted by some to indicate extraordinary speed and turning ability far beyond anything our jets are capable of. Astonishingly, West appears to be the only person among the millions who have viewed these videos to have noticed in the upper left of the screen the camera “zoom” indicator double from 1 to 2 at the moment the objects zooms to the left. When West slowed down the video replay by half at that moment, the extraordinary maneuver becomes quite ordinary. In addition, West notes, sudden movements of the cameras can make the objects look like they are themselves making extraordinary maneuvers: “The supposed impossible accelerations in the ‘Tic-Tac’ video were revealed to coincide with (and hence caused by) sudden movements of the camera, leading to the conclusion that the object in the video was not actually doing anything special.”¹⁶

UFOS AND UAPS

The “Go Fast” video (Figure 3) purportedly shows an object with no heat source (and therefore propelled by some unconventional engine) that appears to move impossibly fast just above the surface of the ocean. West then conducted what he describes as “10th-grade trigonometry” (based on the numbers provided in the video image itself) to show that, in fact, the object was actually well above the ocean surface at around 13,000 feet and was probably just a weather balloon traveling at about 30-40 knots.¹⁷ “Because of the extreme zoom and because the camera is locked onto this object...the motion of the ocean in this video is actually exactly the same as the motion of the jet plane itself. You’re seeing something that’s actually hardly moving at all and all of the apparent motion is the parallax effect from the jet flying by.”

The most talked about video is “GIMBAL,” an object that appears to skim effortlessly over background clouds then come to an abrupt stop and rotate in midair, apparently without the propulsion systems necessary to pull off such a maneuver. Again, astoundingly, West appears to be the only person to notice that when the GIMBAL object rotates, background patches of light in the scene also rotate in perfect union with the object. “I think what’s clear about GIMBAL is it’s very hot—it’s consistent with two jet engines next to each other and the glare of these engines gets a lot bigger than the actual aircraft itself so it gets obscured by it,” West explains. “At the start of the video, it looks like the object is moving rapidly to the left because of the parallax effect, and the rotation was a camera artifact, and that the ‘flying saucer’ was simply the infrared glare from the engines of a distant aircraft that was flying away.”¹⁸ When he looked up the patents for that camera West found that the gimbal mechanism was responsible for the apparent rotation.¹⁹

Since these three UAP videos were re-re-re-posted by the Pentagon in 2020, two more videos by the UAP Task Force have been released. One shows a flying triangle (Figure 4) and the second an apparently zig zagging submersible sphere (Figure 5). West noted that the triangle UAP was filmed at night beneath the flight path into LAX, and that the object blinked in perfect unison with that of commercial airliners flying into Los Angeles from Hawaii. The triangular shape, he surmised, was most likely the result of a triangular shaped lens aperture, slightly blurred, producing a slightly blurred “bokeh” effect, or the soft out-of-focus background generated by photographing a subject with a fast lens and wide aperture.²⁰



Figure 2—GIMBAL image.



Figure 3—Go Fast image.



Figure 4—Triangle image.



Figure 5—Sphere image



Figure 6—First balloon image



Figure 7—Second balloon image

In fact, there were other triangle shaped objects in the image that correspond perfectly to celestial objects that West identified as the planet Jupiter and some known stars.

As for the “zig zagging” spherical object, also filmed off the coast of California from the combat ship Omaha, as you can see in West’s video analysis, it is the camera that is zig zagging, not the object, and it doesn’t “submerge” into the water, it simply disappears beyond the horizon.²¹ And, as you can see, it is in keeping with the historically common UFO collection of grainy photographs and blurry videos.

As well, here are two of the images from the 60 Minutes episode, eagerly presented the next day on Tucker Carlson’s Fox News show as yet another unexplained UAP (Figures 6 and 7). If you saw these images—say at a beach or a park or looking out the window of a plane—and you weren’t thinking of UAPs and UFOs, what would be your best guess as to what they were? Mylar balloons, right? That’s what I see anyway. In any case, that images like these are included in a serious media story as supposedly unidentified, gives one pause.

The Extraordinary Terrestrial Hypothesis

The first alternative to ordinary explanations for the UAP sightings is that they represent Russian or Chinese assets, drones, spy planes, or some related but as yet unknown (to us) technology capable of speeds and turns that seem to defy all currently accepted physics and aerodynamics. Pilots and observers describe “multiple anomalous aerial vehicles” accelerating from 80,000 feet down to sea level in seconds, or making instantaneous turns and even sudden stops, or shooting off horizontally at hypersonic speed, breaking the sound barrier without making a sonic boom, which should be impossible. Not to mention that such rapid accelerations and turns would kill the pilots instantly. Further, these vehicles appear to be able to do so with no apparent jet engine or visible exhaust plume, suggesting that they’re using some sort of antigravity technology unavailable to even the most advanced experimental programs worked on at DARPA.

When 60 Minutes’ correspondent Bill Whitaker asked former Navy pilot Lieutenant Ryan Graves, who had seen with his own eyes UAPs buzzing around Virginia Beach in 2014, “Could it be Russian or Chinese technology?” Graves responded, “I don’t see why not,” adding that “If these were tactical jets from another country that were hangin’ out up there, it would be a massive issue.”²² Indeed, as Top Gun navy pilot and commander of the F/A-18F squadron on the USS

UFOs AND UAPs

Nimitz, David Fravor, told *60 Minutes*, “I don’t know who’s building it, who’s got the technology, who’s got the brains. But there’s, there’s something out there that was better than our airplane.”²³

This hypothesis that the objects are terrestrial and developed by some other nation or corporation, or some genius working in isolation, is not a feasible one given what we know about the evolution of technological innovation, which is cumulative from the past. In his seminal work *The Evolution of Technology*, the historian George Basalla busts the myth of the inventor working in isolation, dreaming up new and innovative technologies out of sheer creative genius (the ping of the light bulb flashing brilliantly in the mind). All technologies, Basalla demonstrates, are developed out of either pre-existing artifacts (artificial objects) or already existing naturfacts (organic objects): “Any new thing that appears in the made world is based on some object already in existence.”²⁴

In his 2020 book, *How Innovation Works*,²⁵ Matt Ridley demonstrates through numerous examples that innovation is an incremental, bottom-up, fortuitous process that happens as a direct result of the human habit of exchange, and that it “is always a collective, collaborative phenomenon, not a matter of lonely genius. It is gradual, serendipitous, recombinant, inexorable, contagious, experimental and unpredictable.” Examples of such cumulative and incremental technological and scientific innovation include steam engines, jet engines, search engines, airships, vaping, vaccines, antibiotics, turbines, propellers, fertilizer, computers, farming, fire, genetic engineering, gene editing, container shipping, railways, cars, wheeled suitcases, mobile phones, corrugated iron, powered flight, toilets, vacuum cleaners, the telegraph, radio, social media, block chain, artificial intelligence, and hyperloop tubes.

It is simply not possible that some nation, corporation, or lone individual—no matter how smart and creative—could have invented and innovated new physics and aerodynamics to create an aircraft of any sort that could be, essentially, centuries ahead of all known present technologies. It would be as if the U.S. were using rotary phones while the Russians or Chinese had smart phones, or we were flying biplanes while they were flying F-18 fighter jets and Stealth bombers, or we were sending letters and memos via Fax machine while they were emailing massive files via the Internet, or we were still experimenting with captured German V-2 rockets while they were testing SpaceX level rocketry. Impossible. We would know about all the steps

leading to such technological wizardry.

Consider the Manhattan Project, arguably the most secretive program in U.S. history to date, which led to the successful development of atomic bombs in 1945. The Russians had an atomic bomb by 1949. How? They stole our plans through a German theoretical physicist and atomic spy named Klaus Fuchs. Modern tech companies like Apple, Google, Intel, and Microsoft are notoriously secretive about their inventions, enforcing extensive security protocols for their offices, and protecting intellectual property rights through patents and lawsuits. And yet...all of our computers, smart phones, computer chips, and software programs are essentially the same, or at least in close parallel development. Countries and companies steal, copy, back engineer, and innovate each other’s ideas and technologies, leaving no single entity very far ahead or behind any other.

In an unintentionally revealing quote in Kean et al’s 2017 *New York Times* article, Harold Puthoff, an engineer and believer in ESP and who worked for the CIA in its remote viewing program, said of these UAP objects: “We’re sort of in the position of what would happen if you gave Leonardo da Vinci a garage-door opener. First of all, he’d try to figure out what is this plastic stuff. He wouldn’t know anything about the electromagnetic signals involved or its function.”²⁶ How would a 15th century artist come into possession of a 21st century technology like a garage door opener? He wouldn’t because of the countless steps in technological development that would have to unfold over centuries to get to that innovation.

The Extraordinary Extraterrestrial Hypothesis

Could these UAPs and UFOs represent visitations by extraterrestrial intelligences (ETIs)? This is also highly unlikely for a number of reasons. But let’s first separate two questions that most people confuse: (1) Are ETIs out there somewhere in the cosmos? (2) Have ETIs come here? When I express my skepticism about the latter, people assume I’m also skeptical about the former. “Do you seriously think we’re alone in this vast cosmos?” is a common rejoinder I hear when I say something like “UFOs are not ETIs.” So let me state for the record that although we have no definitive evidence to answer either question in the affirmative I think it highly likely that they are out there somewhere but have not come here. There’s a lot to unpack here that goes a long way to explaining why these UAPs very probably are not ETIs.

To the first question—are they out there somewhere?—the law of large numbers suggests that they probably are. A 2016 analysis of the Hubble Ultra Deep Field by NASA and the European Space Agency estimated that there are at least one trillion galaxies in the universe.²⁷ Each of these galaxies has at least a hundred billion stars, which makes a total of a hundred million trillion stars in the universe—an almost inconceivably large number made even more staggeringly incomprehensible when written out: 100,000,000,000,000,000,000,000. When we factor in the Kepler Space Telescope’s discovery that nearly all stars have planets, this adds many more zeros to that already Broddingnagian number. We also now know that it takes only a few million years for stars and planets to coalesce out of clouds of dust and gas to form solar systems. In our galaxy alone this happens about once a month. In the universe with the above number of stars, this would mean that a thousand new solar systems are born every second. In her book *Cosmos: Possible Worlds* (the companion to the television series hosted by Neil deGrasse Tyson), Ann Druyan captured the concept poignantly:

Snap your fingers. That’s a *thousand new solar systems* right there. Snap. A thousand new solar systems... Snap. A *thousand new solar systems*... Snap. A *thousand new solar systems*... Snap. Snap. Snap.²⁸

How many of these stars have Earth-like planets orbiting their sun-like star in a habitable zone conducive to the evolution of intelligent life with which we might communicate? This number is usually calculated using the eponymous Drake equation, proposed in 1961 by the radio astronomer Frank Drake for estimating the number of technological civilizations that reside in our galaxy:

$$N = R f_p n_e f_l f_i f_c L$$

Here, N = the number of communicative civilizations, R = the rate of formation of suitable stars, f_p = the fraction of those stars with planets, n_e = the number of earth-like planets per solar system, f_l = the fraction of planets with life, f_i = the fraction of planets with intelligent life, f_c = the fraction of planets with communicating technology, L = the lifetime of communicating civilizations.²⁹ In the Search for Extraterrestrial Intelligence (SETI) literature, a conservative 10 percent figure is often used for the different factors in the equation, where in a galaxy of 100 billion stars there will be 10 billion sun-like stars, one billion earth-like planets, 100 million planets with life, 10 million planets with intelligent

life, and one million planets with intelligent life capable of radio technology. A delimiting factor may be L , depending on how long civilizations last.

In reviewing the scientific literature for my August 2002 column in *Scientific American* on why ET hasn’t called, I found an estimated range for L from 50,000 years to 10 million years, which would result in the number of ETIs in our galaxy alone ranging from 4,000 to one million (depending on the numbers plugged into the other components of the Drake equation). Then using the history of civilizations on Earth, I compiled the lengths of 60 civilizations (the number of years from inception to collapse), including: Sumeria, Mesopotamia, Babylonia, the eight dynasties of Egypt, the six civilizations of Greece, the Roman Republic and Empire, and others in the ancient world, plus various civilizations since the fall of Rome, including the nine dynasties (and two Republics) of China, four in Africa, three in India, two in Japan, six in Central and South America, and six modern states of Europe and America. For all 60 civilizations in my database, there was a total of 25,234 years, or $L = 420.5$ years.³⁰

Plugging these figures into the Drake equation goes a long way toward explaining why ETIs have yet to come here. Where $L = 420.5$ years, $N = 3.35$ civilizations in our galaxy. Given the enormous size of our galaxy (100,000 light years in length and 50,000 light years in width) and the vast distances between the stars, if there were only a few intelligent and communicating civilizations the probability of them making contact with one another is astronomically low. Just how vast and empty is space? If our star were the size of an orange and it were in Los Angeles, the nearest star would be an orange in Chicago 2,000 miles away. In about four billion years the Andromeda galaxy will collide with our own, but in fact the stars are so far apart from one another that astronomers estimate that it is conceivable there will be no stellar collisions. A final example: the speed of our most distant spacecraft, *Voyager I*, is 38,578 miles per hour. If it were heading to the Alpha Centauri star system, (which it isn’t) the closest one to our sun at 4.3 light years away, it would take *Voyager I* 74,912 years to get to there.

If there are ETIs in our galaxy the chances of them finding Earth and visiting us even once is staggeringly low, let alone buzzing our airspace on a daily basis. Thus, the UAP = ETI hypothesis is extremely unlikely to be true.

**Bayesian Reasoning About UFOs,
or Why Extraordinary Claims
Require Extraordinary Evidence**

UFOS AND UAPs

How should we evaluate the likelihood of any of these three hypotheses—ordinary terrestrial, extraordinary terrestrial, extraordinary extraterrestrial? Let's start by applying the principle of proportional evidence, articulated in the 18th century by the Scottish philosopher David Hume in his 1748 *An Enquiry Concerning Human Understanding*: "A wise man proportions his belief to the evidence." The common expression for this principle is *extraordinary claims require extraordinary evidence*, or ECREE, popularized by Carl Sagan in his 1980 television series *Cosmos*, during the episode on the possibility of extraterrestrial intelligence existing somewhere in the galaxy, or aliens having visited Earth. ECREE means that an ordinary claim requires only ordinary evidence, but an extraordinary claim requires extraordinary evidence. The claim that ETIs have visited Earth is not just extraordinary; there is general agreement among both UFOlogists and SETI scientists that it would be one of the most extraordinary discoveries in the history of humanity.

UFOlogists claim that extraordinary evidence exists in the form of tens of thousands of UFO sightings. But SETI scientist Seth Shostak points out that this fact actually argues *against* UFOs being ETIs, because to date not *one* of these tens of thousands of sightings has materialized into concrete evidence that UFO sightings equal ETI contact.³¹ Lacking physical evidence or sharp and clear photographs and videos, *more* sightings equals *less* certainty because with so many unidentified objects purportedly zipping around our airspace we surely should have captured one by now, and we haven't. And where are all the high-definition photographs and videos captured by passengers on commercial airliners? The aforementioned Navy pilot Ryan Graves told *60 Minutes'* correspondent Bill Whitaker that they had seen UAPs "every day for at least a couple of years." If true, given that nearly every passenger has a smart phone with a high-definition camera, there should be thousands of clear high resolution photographs and videos of these UAPs. To date there is not one. Here, *the absence of evidence is evidence of absence*.

The ECREE principle is itself a specific form of Bayesian reasoning, invented in the 18th century by the Reverend Thomas Bayes. Roughly speaking, Bayesian reasoning has to do with the strength of evidence for a claim, and the reasoning rule has to do with how much we should revise our estimation of the probability of a claim being true based on the evidence. When the evidence changes we should

change our probability estimates accordingly. These estimations of probabilities based on prior knowledge of conditions related to the claim are called "priors"; or our initial degree of belief. The probability of something being true determines what is called the "credence" of belief, or the credibility or strength of the belief. Think of credence as the probability of something being true as a percentage. For example, you should believe with 50 percent credence that a fair coin toss will land heads based on your priors that flipped coins land 50/50 heads/tails. Or, if a bag contains four red marbles and one blue marble, and you withdraw one marble at random, then you should believe with 80 percent credence that the random marble will be red.

To put it a slightly different way in this context, an extraordinary claim—for example, that UFOs = ETIs—has a low Bayesian prior because of the poor quality of the evidence for it, and thus the credence for the hypothesis that UAPs = ETIs remains low unless better evidence emerges. Until then, we should have a lower credence in the claim of being visited by ETIs. The same Bayesian reasoning applies to UAPs as Russian or Chinese assets. Given what we know about the evolution of technological innovation—that it is gradual, recombinant, contagious, collaborative, and cumulative—no nation or corporate entity can have built drones or aircraft with such extraordinary physics and aerodynamics without us knowing about it. So, again, lacking extraordinary evidence in the form of an actual captured object, our credence that these UAPs represent extraordinary terrestrial craft remains low.

That leaves us with ordinary explanations for these phenomena. No matter how skeptical you may be of them, they are vastly more likely than either of the extraordinary hypotheses. Why, then, do so many people want to believe that they represent something more? I will conclude this analysis by turning to psychology, religion, and the desire to believe we are not alone.

Sky Gods for Skeptics

In his 1982 book *The Plurality of Worlds*, the historian of science Steven Dick suggested that when Newton's mechanical universe replaced the medieval spiritual world it left a lifeless void that was filled with the modern search for ETI.³² In his 1995 book *Are We Alone?* the physicist Paul Davies wondered: "What I am more concerned with is the extent to which the modern search for aliens is, at rock-bottom, part of an ancient religious quest."³³

The historian George Basalla made a similar observation in his 2006 work *Civilized Life in the Universe*: “The idea of the superiority of celestial beings is neither new nor scientific. It is a widespread and old belief in religious thought.”³⁴

In a 2017 article in the journal *Motivation and Emotion*, “We Are Not Alone,” the psychologist Clay Routledge and his colleagues found an inverse relationship between religiosity and ETI beliefs—that is, those who report low levels of religious belief but high desire for meaning show greater belief in ETIs.³⁵ In Study 1, subjects who read an essay “arguing that human life is ultimately meaningless and cosmically insignificant” were statistically significantly more likely to believe in ETIs than those who read an essay on the “limitations of computers.” In Study 2, subjects who self-identified as either atheist or agnostic were statistically significantly more likely to report believing in ETIs than those who reported being religious (primarily Christian). In Studies 3 and 4, subjects completed a religiosity scale, a meaning in life scale, a well-being scale, an ETI belief scale, and a religious supernatural belief scale. “Lower presence of meaning and higher search for meaning were associated with greater belief in ETI,” the researchers reported, but ETI beliefs showed no correlation with supernatural beliefs or well-being beliefs.

From these studies the authors conclude: “ETI beliefs serve an existential function: the promotion of perceived meaning in life. In this way, we view belief in ETI as serving a function similar to religion without relying on the traditional religious doctrines that some people have deliberately rejected.” By this, they mean the supernatural. “That is, accepting ETI beliefs does not require one to believe in supernatural forces or agents that are incompatible with a scientific understanding of the world.” If you don’t believe in God, but seek deeper meaning outside of our world, the thought that we are not alone in the universe “could make humans feel like they are part of a larger and more meaningful cosmic drama.”

Given that there is no more evidence for aliens than there is for God, believers in either one must take a leap of faith or suspend judgment until evidence emerges to the contrary to change our credence. I can conceive of what evidence might be for ETI—a captured spacecraft would do—but not for God, unless the deity is a sufficiently advanced ETI as to appear divine. With the decline in religious belief over the past century, perhaps this is what lies behind this quest to understand the unidentified. **S**

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Thought Experiments

What Good Are They, Anyway?

BY CHRIS EDWARDS

A THOUGHT EXPERIMENT IS ONE THAT EXISTS PURELY in the mind and it differs in purpose from a scientific experiment because the object is to clarify analogical reasoning rather than to collect experimental evidence. The scientific community does not scoff at thought experiments, but rather treats them as being occasionally useful for clarification. Some of these experiments, partially through their flashy names, are now embedded in the intellectual lexicon. “The Trolley Problem” and “The Prisoner’s Dilemma” get used quite a lot in ethics and economics. Yet, the thought experiment remains underused.

Thought experiments, when framed by scientific principles and shaped by logic, can clear up much of the confusion in what may broadly be conceived of as the problems inherent in the entire modern conception of knowledge and theories about knowledge. Scientific experiments exist to collect research data; thought experiments exist to help us collect our thoughts and correct our perceptions. As a scholar and teacher my interests are in the development of cross-curricular lessons and insights. Thought experiments function in a traditional philosophical sense by actually solving problems. However, they also, and probably more than any other teaching method, require students to think at a deep level in the subject of analogy. What is similar and what is different between cases? In addition; thought experiments always require students to study the situation in a meta-cognitive way, but challenging their own base assumptions involving the subjects at hand. They might be the key in breaking away from the passing-on-of-received-knowledge-and-skills educational model that still dominates.

Thought experiments come in different categories, and some experiments will overlap. Three of the most famous involve: (1) the concept of a future Singularity (the point where the universe itself becomes conscious); (2) the “Trolley Problem” (a riddle of sorts that engages one’s emotional and cognitive reasoning skills); and (3) “The Prisoner’s Dilemma” (a construct of game theory and is tied to rational choice).

Ray Kurzweil and the Singularity

The concept of a technological “singularity,” established by the inventor and futurist Ray Kurzweil in his best-selling 2005 book *The Singularity is Near: When Humans Transcend Biology*, consists of the notion that humanity and technology intertwine to move history in a specific direction. Kurzweil imagines a scenario where current trends regarding technological complexity will continue until they reach an inevitable singularity point where the universe will “wake up.”

Kurzweil’s prediction cannot be described as new but in order to analyze him and the flaws of his thought experiment he must be compared to the appropriate historical philosopher. It is tempting to compare the philosophy of Kurzweil with that of the Jesuit theologian Pierre Teilhard de Chardin (1881–1955), since both men noted that the evolution of humanity and society trends toward ever greater levels of complexity. Kurzweil’s ideas about predicting the future are also similar to those of Karl Marx, who believed that by understanding history it becomes possible to predict an inevitable future outcome. But, in fact, Kurzweil’s philosophy is more analogous with that of St. Thomas Aquinas, who was commissioned by the Catholic Church in the 13th century to “prove” the tenets of Christianity using the then newly recovered Aristotelian logic. Aquinas, as Bertrand Russell pointed out, was not a true philosopher since he already knew the conclusion and tried to blaze a trail of reason backwards. When this proved impossible, Aquinas could simply use faith as a crutch. Although different in form, this is the same flawed approach to a philosophical thought experiment that Kurzweil takes.

Before pointing out the errors of Kurzweil’s thought experiment regarding a future “singularity” it is first necessary to encapsulate his theory: Kurzweil’s major assertion is that human evolution should be divided into six epochs.

1. Epoch One involved Physics and Chemistry, which included the storing of information in atoms.
2. Epoch Two, titled Biology, included the transforma-

tion of matter into “life,” and thus of physics into biology.

3. Epoch Three, titled Brains, involved the evolution of the human brain.
4. Epoch Four, called Technology, involved the creation of information and hardware systems. These first four epochs are interesting, and Kurzweil is outstanding at describing a process that has already occurred.
5. Epoch Five is the Merger of Technology and Intelligence, which Kurzweil describes like this: “The methods of biology (including human intelligence) are integrated into the (exponentially expanding) human technology base.”
6. Epoch Six is even more dramatic, in that Kurzweil predicts that all of the particles of the universe will be endowed with data processing capabilities and will also be able to store knowledge. This is the point where the universe will “wake up.” (Besides this, an awful lot of good things, including eternal life, are supposed to come to humanity in the future.)

Unfortunately this thought experiment, one where Kurzweil predicts and imagines the future is built upon three major logical and scientific errors. The icon of Kurzweil’s techno-theology is the “S” curve, designed to show exponential growth in the power of technology. Kurzweil correctly sees technological evolution as being an extension of biological evolution, but does not take into account all of the aspects of this analogy. In nature, complexity comes with an energy cost, so organisms don’t become complex just for the sake of it. Simple organisms, such as worms are as abundant as simple inventions such as ink pens because sometimes complexity isn’t worth the energy and simplicity is good enough. Technology evolves to survive in the market, not to be complex, and if the cost is too great to supply a return then the rate of complexity will slow down. Exponential growth can slow, stop, or recede very quickly if the energy cost is too great. Flight, for example, did evolve rapidly between Kitty Hawk and the first Moon landing, but the cost of deep space exploration is simply too great to justify, so manned flight complexity settled into jet travel. Even at the pinnacle of that stage—the Supersonic Transport, or the Concorde—went into reverse due to economic and political restraints on the upward sloping curve. Even when humans made it to the Moon, we were, practically speaking, no closer to landing people on Mars than we were before leaving Earth.

If evolutionary history moves in a direction,

then why hasn’t Epoch Six, where the universe “wakes up,” already occurred in some alien civilization somewhere else in the universe? Here is Kurzweil’s answer:

The conclusion that I reach is that it is likely (although not certain) that there are no such other civilizations. In other words, we are in the lead. That’s right, our humble civilization with its pickup trucks, fast food, and persistent conflicts (and computation!) is in the lead in terms of the creation of complexity and order in the universe. Now how can that be? Isn’t this extremely unlikely, given the sheer number of likely inhabited planets? Indeed it is very unlikely, but equally unlikely is the existence of our universe, with its set law of physics and related physical constants, so exquisitely, precisely what is needed for the evolution of life to be possible, if the universe didn’t allow the evolution of life we wouldn’t be here to notice it. Yet here we are. So by a similar anthropic principle, we’re here in the lead in the universe. (p. 357).

The anthropic principle cannot be used to favor a prediction, only to explain an event that has already occurred. If one adds enough factors, then the odds of perfectly ordinary events can be made to sound outlandishly low. For example, the odds on a Wednesday afternoon that the workers in a certain office will all show up wearing clothes on Thursday morning are pretty good. However, if one tried to predict the color schemes and styles of those clothes (thus adding factors) then the odds of being right drop dramatically because of the large number of different possible combinations. After everyone shows up on Thursday morning, dressed in one of those heretofore incredibly unlikely combinations, then one can invoke the anthropic principle to explain this ordinary event. But only after the fact. The workers had to be clothed in some possible combination, and this is how it randomly ended up. The future has to look some way, but not necessarily the way Kurzweil thinks it will. Just because the anthropic principle can be used to explain the occurrence of a highly unlikely event post facto, this emphatically does not mean that it can be used to confidently predict that a highly unlikely event will occur in the future. Kurzweil is reasoning in reverse, creating a syllogism that looks like this: A. The universe is destined to “wake up.” B. The universe has not yet “woken up.” C. Therefore, our civilization must be leading the charge.

The final problem with Kurzweil’s thought experiment is more concrete. The speed of light isn’t fast enough for the universe to wake up as quickly as he predicts. This constitutes a major issue, since

Einstein's theory of relativity predicts that it is not possible for anything to accelerate to exactly the speed of light. Kurzweil, however, dismisses this fundamental rule of physics by simply claiming that it is possible to go faster than light in the sense that relativity theory does not forbid space from expanding faster than light (some models of the early universe state that this may have occurred after a "Big Bang") but relativity theory does forbid information carrying particles from accelerating beyond that speed.

No matter, Kurzweil predicts that physicists will either figure out a way around light speed (maybe they can stop entropy while they are at it), or that humans will use wormholes as a shortcut. Why does he think this is possible?

[L]imits are not always what they seem. New scientific understanding has a way of pushing apparent limits aside. As one of many such examples, early in the history of aviation, a consensus of analysis of the limits of jet propulsion apparently demonstrated that jet aircraft were infeasible (p. 138).

But sometimes limits are what they seem. The speed of light "barrier" is not like the "speed of sound" barrier. Physicists were perfectly aware of faster than sound particles well before the development of jets. Einstein's theory of relativity is itself a thought experiment, one where Einstein posited questions about the nature of motion and speed and then formed an analogy. Energy is like mass ($E=M$) and if we square the speed of light (C for *celeritas*, which is Latin for

"speed") then we create a square picture frame of theory that describes everything in the universe that moves slower than light speed. Had Einstein created $E=MS^2$ with the "S" standing for "sound" then he would have created a square picture frame of theory that describes everything in the universe that moves slower than the speed of sound.

Does this mean that Kurzweil could be right in saying that information could travel faster than the speed of light? Maybe. But this is not what Kurzweil's thought experiment predicts. He states that modern human civilization on Earth will create this singularity, and that means he believes that we humans will develop means of accelerating particles past the speed of light; something beyond the limits of ordinary physical rules regarding acceleration and speed.

Kurzweil offers no detailed explanation, no coherent theory, for how this "limit" can be surpassed, but merely calls on the reader to put his or her faith into an ever-increasing power of technology and science. And faith, whether it be in gods, fairies, or technological advancement is never useful in the scientific sense. Like Aquinas, Kurzweil already knows the ending, and in both worldviews there is eternal life waiting for those who believe.

The Trolley Problem and the Problem of Autocracy, or Self-Driving Cars

Imagine the following scenario: You are standing next to a fork in a railroad line where there is a switch. There are five workers on the one track and

The Trolley Problem

Would you sacrifice one to save five?

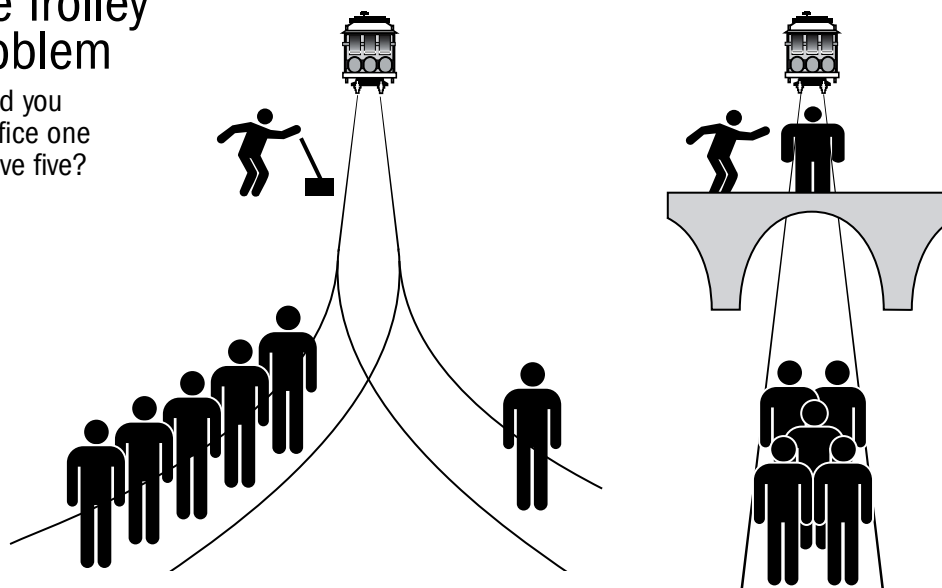


Illustration by Pat Linse

one worker on the other track. A trolley car is hurtling down the track and is about to hit and kill the five workers unless you throw the switch and divert the car down the other branch, thereby killing the one worker instead. Would you throw the switch to kill one worker in order to save five?

Most people say they would kill one worker in order to save five. In a second scenario, you are standing on a bridge next to a large man. The trolley is once again speeding down the track and is about to hit and kill five workers, unless you push the large man onto the track, killing him but stopping the car, thereby killing the one in order to save five. Would you throw the man? Most people say they would not.

This is a classic thought experiment first proposed in 1967 by the philosopher Phillipa Foot that has become ingrained into a hot new area of research called Moral Cognition Testing (MCT) that is being employed by psychologists and philosophers who study human behavior and the brains in relation to morality. A 2011 *Discover* magazine article entitled “The End of Morality” by Kristin Ohlson, for example, profiled the work of Harvard scientists Joshua Greene and Fiery Cushman, who present people with a variety of such moral scenarios and then ask for responses.

For example: A runaway hot dog cart hurtles toward a group of bicyclists. Should you push the cart into the crowd, killing three people, or let the cart slam into some passing bicyclists, killing a dozen? Another scenario, which purportedly stumped Green in a high school debate and made him rethink his utilitarian philosophy, involves asking whether or not it would be moral to kill a single person and harvest his organs so that five people might live. Supposedly, both scenarios involve the same type of reasoning and involve the same outcomes so there is little moral difference.

There are two problems with the above dilemmas. To begin with, nothing in the real world operates in such a clean way with limited and perfectly predictable outcomes. I would not shove the hot dog cart into a crowd because it reduces a crucial component of the scenario: time. In the real world, acting quickly in that situation reduces the probability that someone would scream and alert the riders or that one of the riders would see the cart and actually move. By shoving the cart, I’ve immediately caused the deaths of the bystanders. By reducing time, I’ve reduced the possibility of better outcomes. In reality, actions do not usually have such absolute endings, and presenting people with absolutes does not really

help to ascertain how they reason morally.

For the second scenario, one should not kill the man and harvest his organs, and not do so for good utilitarian reasons. Killing the man may at first appear to be the best action for the most people, but in fact doing so would give moral justice to a concept that over time would create a great amount of fear and uncertainty that would eventually do more damage to more people. If society considered it morally justifiable to kill people who were in waiting rooms, even for good reasons, then hospital visits would likely decline and human misery would increase. The scenarios involving hot dog carts and hospital visits are not similar because, while runaway wiener carts are likely singular events, hospital bystanders are common. One can’t compare the two because the effects of action in the second scenario have larger societal outcomes. The concept of “larger societal outcomes” remains underused by Utilitarian philosophers. An action that affects an individual negatively almost never turns out to be good for the group entirely.

Anti-utilitarian arguments sometimes take the form of “if four people were stranded on a desert island, it would be good for the group if one person was eaten by the other three.” This would not be the case; even if one considers the inherent problems that would come with trying to prepare and eat a human corpse on a desert island. Presumably, none of the four would want to be eaten, so a general agreement that no one gets eaten might be seen as being for the greater good.

If we remove the scenario from the desert island, it’s hard to find any conditions where three people deciding to eat one person would be beneficial for the group. This is true, particularly if we start to consider the anxiety inducing effects that the logic of cannibalism would have on the group. At some level, Utilitarian philosophy is an offshoot of Immanuel Kant’s (1724-1804) famous “categorical imperative.” Kant’s philosophy can be paraphrased in question form as “if my action was made a universal rule, would it be positive for humanity?” The categorical imperative causes much moral confusion because, ethics permits no universal rule because the word “universal” remains open to interpretation.

For example, let’s imagine an ethical English philosopher/soldier in a WWI trench with 20 of his comrades. Half a mile across from our soldier, 20 German soldiers sit crouched down in their own trench, weapons in hand. If our English soldier decides not to fight, and everyone in both trenches

followed his example, this would work out well for everyone in true Kantian fashion. However, if the philosopher/soldier decides not to fight and the Germans fail to be inspired by his ethics, then his action merely helped in the destruction of the other soldiers in his own trench. If “universal” is exclusively defined by our soldier and the 19 other British soldiers in his trench, then deciding not to fight would be suicidal. If all 40 soldiers involved in this scenario decide not to fight, then everyone wins (until they are court-martialed, that is).

A variation of this problem with the categorical imperative is known as “the Prisoner’s Dilemma”. Another Trolley-like problem involves a crying baby and some hypothetical soldiers. Imagine yourself in a room holding your hand over your baby daughter’s mouth to prevent her from crying. Evil soldiers are outside, hunting you and your family and friends. Should you remove your hand and let the baby breathe (and cry), or should you preserve the hiding place by smothering the baby? (This scenario was, in fact, played out in the final episode of the popular television series *M*A*S*H*.) Such a scenario is psychologically pointless in that it will not tell anyone how people morally reason, primarily because it removes a peer pressure dynamic. For most people, the real answer to how they would react in such a scenario would likely be dramatically affected by the responses of the other people in the hiding place, and we cannot assume that all of those people would be selfishly interested in survival. Medieval Jews faced with homicidal Crusaders often committed mass ritual suicide, with group dynamics and pressure overriding the survival impulse.

Think of how quickly such role-playing becomes silly when you try to add additional peer pressure factors. Here are a couple of examples: (1.) You are a Rwandan Tutsi surrounded by three family members and two strangers—one of the strangers wants you to smother the baby, the other one is paralyzed by fear and expresses no preference, and your family wants you to let the baby scream. Genocidal Hutus are just outside of your hiding place. What do you do? (2.) You are a medieval Jew, raised in a family that places pride of religion first etc. Since an ethicist cannot actually become another person with a separate identity, these questions of ethics become almost irrelevant.

Also, one shouldn’t shove the man in front of a trolley because I can’t do the calculations quickly enough to determine whether his weight would stop the trolley’s momentum. By shoving him, I

would most likely create a situation where the man died a messy death and everybody else still got maimed or killed. Besides, if I had enough time to shove the man I could just as easily yell at the (apparently blind) folks on the trolley track.

Greene and Cushman, working with Princeton neuroscientist Jonathan Cohen, are studying which parts of the brain become engaged when participants are asked to reason through such situations. Greene, Cushman, and Cohen then create scientific theories to explain the results. When it was found, for example, that only 30% of people would shove a hypothetical man in front of the hypothetical trolley but that 60% would pull a lever that would drop the man through a trapdoor onto the tracks, Greene noted: “We seem to have this general mechanism that makes us reluctant to engage in physical violence.... In this very unusual case, our emotions don’t distinguish between gratuitous violence and acts aimed at promoting the general good.”

Here Greene is theorizing over highly compromised facts based upon a hypothetical scenario with strictly defined outcomes. In effect, he’s theorizing about real human behavior based on hypothetically controlled situations that are in fact impossible to predetermine. As he notes: “It’s been increasingly difficult to find a single theory that fits [moral reasoning]. My approach is to say, forget the overriding theory. Our moral judgments are sensitive to kooky things, like whether you’re pushing someone with your hands or dropping him with a switch. There is no single moral faculty; there’s just a dynamic interplay between top-down control processes and automatic emotional control in the brain.”

This is highly problematic because Greene is reasoning from outcomes based on scenarios with fixed outcomes. Logical thinking in the form of snap judgments can be made when the future is uncertain. In the real world, moral actions rarely if ever have such fixed outcomes. Instead, the human mind must quickly consider the probabilities of a given action in a given situation. The mind evolved specifically to assess risk in chaotic environments, and is quite good at it. We cannot ask a mind that reasons through risk assessment to apply its evolved moral function to static situations and expect to create theories that genuinely explain human reasoning. Greene and Cushman are measuring how people think about hypotheticals, but are not assessing how people reason morally.

Further, such research suffers from the fallacy of the false dilemma, which occurs when someone is

Prisoner's Dilemma

		PRISONER LARRY'S STRATEGY	
		LARRY KEEPS QUIET	LARRY SNITCHES
PRISONER BILL'S STRATEGY	BILL SNITCHES	Bill freed, Larry gets 3 years	Both get 2 years
	BILL KEEPS QUIET	Both get 1 year	Larry freed, Bill gets 3 years

presented with a set of choices and is told that these are the only selections available. Skeptics are familiar with this fallacy when Creationists insist that if: A. evolution cannot explain some mystery (yet), then B. Creationism must be the explanation. In a different form, this fallacy plagues Moral Cognition Testing because participants are asked to moralize about actions that have fixed and predictable outcomes, which is not the way that people reason in a world filled with multiple potential outcomes and uncertainty.

The Prisoner's Dilemma

The Prisoner's Dilemma (PD) may be the most well-known thought experiment in the social sciences. This is probably because the PD features a scenario by which acting in one's own self-interest can lead to a worse outcome for yourself. A disconnect exists between the intent and the outcome, and since the scenario factors in the decision-making processes of other people, the PD itself becomes a powerful thought experiment that can be used across a variety of thought experiments.

The concept behind the PD was developed in 1950 by two RAND scientists, Merrill Flood and Melvin Dresher. Later, a Canadian game theorist and

mathematician named Albert W. Tucker gave the concept its distinctive title and he included the factor of the prison sentences. The thought experiment includes two recently arrested criminals. They generally go by the title of Prisoner A and Prisoner B, but let's call them Bill and Larry. Imagine that Bill and Larry are arrested and then prevented from communicating. Three options emerge:

- A. Bill snitches on Larry and Larry refuses to snitch on Bill, then Bill will be set free and Larry will receive a three-year sentence. This also applies vice versa.
- B. If both Bill and Larry stay quiet, then they each will be given a lesser charge and will spend just one year in prison apiece.
- C. If Bill and Larry both snitch on each other, then both of them will be given a two-year sentence.

The interesting point of the PD is that what is good for you depends upon the unknown actions of another person. If Bill stays quiet, that's good for Larry, but if Larry decides he does not care about what's good for Bill, then he will snitch. The situation has it that snitching is the best outcome, but only if the other person remains quiet. When both snitch, both end up serving a longer sentence than they would have if both had stayed quiet.

For all of its fame, the PD really cannot rate as a great thought experiment because it relies on too few factors. To explain, let's imagine that Stanley Milgram's (1933-1984) famous psychological experiments on obedience to authority never occurred. Let's frame Milgram's work as a thought experiment. If we set the scenario, where the subject is being told to deliver electrical shocks to a person (an actor, as it turns out) in another room just because an authority in a white lab coat told her to, in the hypothetical realm and titled The Subject's Dilemma, it would look like this:

Subject A receives stress and guilt for delivering shocks but would receive no penalty for not delivering the shocks.

In this static environment; one would see no reason for delivering shocks at all. Yet the actual experiments (depending on the interpretation of the data sets) that involved humans and their behavior found that many of the subjects would act irrationally. We all know that hypothetical models cannot predict human behavior, but that may be because the models fail to include all of the factors. Let's look again at our Subject's Dilemma:

Subject A receives stress and guilt for delivering

shocks but would feel as if she was “in trouble” with authority if she delivered no shocks.

This is suddenly different. Rather than suffering no penalty, the subject feels the pain of standing up to authority, something that few people are comfortable with. One can only assume that, like anything else, one becomes better at it with practice.

Likewise, the PD does not factor in that a criminal might suffer negative consequences for snitching on his partner. If a criminal keeps his mouth shut about a caper, and his partner sings on him, then the quiet criminal might be out for a little revenge after his three-year sentence ended. The concept of living in fear, or of being considered a snitch, might rather alter how someone behaves in this kind of dilemma.

Let's compare the PD to another thought experiment. Imagine that a father one day receives a text message from two men who have kidnapped his ten-year-old daughter. The men demand that a ransom be paid to a certain account and that the father not contact the authorities. When the money is paid, the men will set the girl free in a public park. The father might know that his kidnappers have no logical reason to set the girl free. If caught, the kidnappers would be guilty of multiple felonies already and to leave the girl alive would be to risk being identified later. After they receive the money, they would have no more use for the girl and, since they hold the girl, the father really has nothing to bargain with. Should the father pay the money? Logically, no. But I would pay in this situation. Wouldn't you? The father might surmise that his daughter has a slightly higher chance of surviving if the payment is made.

There might not be a good reason for thinking this; and the likeliest scenario is that the father loses both a great deal of money and his daughter, rather than just his daughter, but in this condition the money itself becomes worthless next to the small percentage bump that paying the money might give his daughter toward survival.

Did you see that the Kidnapping Dilemma is almost the same as the Prisoner's Dilemma? In the Kidnapping Dilemma the father can either: A. Not pay money and virtually guarantee that his daughter dies, but he only loses a daughter and not his money. Or: B. Pay money and his daughter will still likely die, and he loses his daughter and his money.

Meanwhile, the kidnappers are faced with a dilemma as well. If they don't receive the money, then killing the girl would open them up to murder

charges. If they do receive the money, then giving the girl back could potentially make them vulnerable. Either way, the decision they make will alert the media and cause a police search. The best situation for them would be to A. Receive the money and then kill the girl. Thus, by making the payment, the father actually makes it more likely that his daughter will die. This is true, however, only if the kidnappers are entirely rational. Given that they are snatching ten-year-old girls, this hardly seems likely and so the best decision would likely be to pay and hope.

This is a morbid thought experiment, but it highlights the fundamental problem with the Prisoner's Dilemma; no moral decision can be reduced to quantifiable factors, like money or the length of a prison sentence. The Kidnapper's Dilemma engages your emotional reasoning at a deeper level than the Prisoner's Dilemma does, which is why the parallels between the situations probably went unnoticed at first glance.

If both of the criminals in the Prisoner's Dilemma were in the mafia, they both would get a status bump, including protection while in the penitentiary, for staying quiet (or so watching crime movies would have one believe), while “snitching” might help someone to avoid prison, it might also mean the abandonment of one's entire life in a witness relocation program. How does the dilemma look then?

The Singularity, the Trolley Problem, and the Prisoner's Dilemma all represent a type of thought experiment; extrapolating on the future, moral reasoning by analogy, and the ethical reasoning in a situation where the outcome is dependent upon the actions of another person or persons, respectively.

Pascal's Wager

The French theologian and mathematician Blaise Pascal (1623–1662), was clearly undone by his desire to reconcile his logical mind with the Christianity he hoped to believe in. Unable to find any level of compatibility between faith and reason, Pascal devised a logical construct to help him believe. Paraphrased, it reads “Christianity may or may not be true. However, if it is true and I live as an unbeliever, I will burn in Hell for eternity. If it is not true, and I live as a believer, I will just die and cease to exist. Therefore, it is better to live as a believer.”

Several problems probably just immediately manifested in your mind. Which version of Christianity is the right one to believe in? What if God is Muslim or Zoroastrian? What if God really wants

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you to doubt rather than to have faith? Doesn't this wager posit a "trickster" God who waits to punish people for believing the wrong way and reward people for believing the right way? Pascal's Wager is just not very good logic, but philosophers who pick on it might do well to recognize that this is not the actual wager that most believers make.

Clearly, Pascal created a False Dilemma in believing that he had an either/or choice between belief and non-belief. He failed to recognize a belief in god for what it is: evidence that one has not learned to reason properly. A skeptic who debates a theologian about the existence of a god might state that "we don't debate the existence of obvious things like the Sun or the Moon. The fact that the issue is being debated at all indicates that the existence of a god is not clear, and so the debate can only be about the existence of a god with a certain set of characteristics, the first of which is that this god does not want to provide clear evidence of her existence. This is an odd way for a deity to behave."

Yet, Pascal's Wager is not the bet that most believers make. When the death of a loved one occurs, it might make the grieving person feel better in the present to believe that a reunification will one day occur in the afterlife. What is interesting is that people often think that in order to believe in an afterlife, they must also believe in the entire set of religious doctrines that support the concept of the afterlife. This makes Pascal's Wager more reasonable; if someone believes, then she receives a temporary (and likely miniscule) amelioration of emotional pain.

At some level, Pascal's Wager, the Prisoner's Dilemma, and the Kidnapper Dilemma all involve one party making decisions that are affected by the decisions of another silent party.

The Autocracy Problem, Artificial Intelligence, and Self-rule in Cars

As self-driving cars have become more likely, a new debate about ethics and Artificial Intelligence has created a modern thought experiment: If a car driven by AI has a motorcyclist on either side of it, with Motorcyclist On the Right (MOTR) wearing a helmet and Motorcyclist on the Left (MOTL) not wearing a helmet, and if the car is behind a semi and something falls off the back of the semi, then should the car swerve left or right? If the car swerves into the MOTR, then the odds of the motorcyclist living are better than if the car swerves into the MOTL. However, by swerving into the MOTR, the AI-driven car punishes someone for wearing a

helmet. The scenario, again, limits too many factors and contains too many inconsistencies.

- A properly-functioning AI would recognize probabilities and avoid situations such as this. The car would not be close enough behind a semi that could potentially drop a load, and it would slow down before finding itself contained in such a spot. By analogy, try to imagine that a young woman has an app that helps her to avoid dangerous parts of a city. The question is not "what would the app do if she was trapped between a mugger and a ravenous pit bull?" but "how could the app possibly let her get into that situation to begin with?"
- The purpose of an AI-driven car would be to increase safe transportation. In that way, an AI car is analogous to a subway or to airline travel. People who ride motorcycles do so for entertainment more than for transportation. No one rides a motorcycle on a subway track, and there are no planes-for-pleasure that fly alongside commercial aircraft at top altitudes. It would make very little sense to have motorcycles on the road that are driven by humans with cars driven by AI. This posits a question; should motorcyclists and human drivers be given a lane of their own? If so, would this become a "death lane" where virtually all motor vehicle accidents would occur?

It might seem unfair to "go meta" on these scenarios by questioning their parameters, but if a thought experiment lacks logically consistent boundaries, then it fails to instruct at all. Accidents often happen when a series of events come together at a focal point, such as: A. the sun is in a driver's eyes, and B. A pedestrian has headphones on, and C. Kids in the back of the car are misbehaving. A highly functioning AI would be able to pick up on at least a few of these and avoid entering into a scenario that would entangle all the factors.

Now, to answer the "so what?" question, the last point about a human-driver "death lane" does have an immediate analog in the current world. Random violence (serial violence) is declining. Is this because cellphones make people safer due to the possibility of quick connection with the police and because bystanders or victims can record criminal activity? If so, does this mean that serial-predators will look to prey upon people in areas like out of the way nature parks, or Amish communities, where cell phone access is unlikely to protect a victim? If so, then are we creating "wi-fi-less" death lanes without knowing it, and if so, what should we do about it?

The Watchmaker Thought Experiment

Kurzweil's Singularity conceit, the Trolley Problem, and the Self-Driving car problem all fall into a category of error that can be called the False Analogy. No analogy between scenarios will ever be exact; the purpose of analogizing is to determine the similarities and differences between scenarios. However, a False Analogy occurs when a philosopher makes the case that two dissimilar scenarios are, somehow, exactly alike.

Kurzweil compared jet travel to the speed of light and assumes an analogy of evolutionary exponential growth without recognizing that evolution is often constrained by energy costs. The Trolley Problem compares a runaway trolley with a hospital waiting room and, in the analysis, fails to factor in that runaway trolleys are unique while hospital waiting rooms are common, and that difference is why the ethical reasoning for both situations must be different.

False analogies can be enormously useful as intellectual tools because identifying the problems with a false analogy can frequently lead to the development of new insights that get closer to the reality of a natural function, thus making the analogy itself more practically useful. The most (in)famous false analogy was created by the theologian William Paley (1743-185) who posited that if he came across a watch, that logically meant there must be a watchmaker.

Charles Darwin (1809-1882), stayed in the same room at Cambridge University that Paley had once inhabited; and Darwin found himself piqued by Paley's Watchmaker analogy. Eventually, Darwin would realize that a complicated thing does not need a more complicated thing to have created it. In fact, to think that a watch just popped into existence, fully formed, without any ancestors is an absurd notion.

Evolutionary theory has it that a watch would evolve, with humans acting as an environmental selector that chooses the most efficacious models for survival. Evolution provides proof for its process in the form of sundials, water clocks, and center of the town medieval bell clanging clocks as ancestors of the watch.

To analyze the failures of Paley's analogy was to create a theory of devastating clarity, and, by analogy, something that can explain every single complex thing, natural or mechanical, in the universe. Evolutionary theorists, when debating Creationists, overexplain and allow themselves to get bogged down in details about viral phalanges and the like, but evolution is not hard to understand. Did PlayStation 4 come out before PlayStation 3? Were there no antecedents to the iPhone? Did the Creation Museum in Kentucky just pop fully

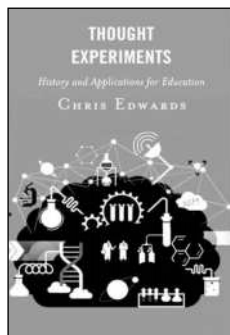
formed and without the help of blueprints based on previous models, into existence in a moment?

Uses and Abuses of Thought Experiments

For educators, the act of highlighting the history of thought experiments creates the right conditions for students to engage in an analysis of how the intellectual ideas that make up a core curriculum developed in the first place. In some ways, the big ideas of history tended to begin with esoteric questions that a person with a cross-curricular background then answered by seeing novel connections between content. By processing thought experiments, students can also apply skepticism for the purpose of uncovering false arguments in logic.

Clearly, thought experiments are too powerful and useful to not be applied to some of the deepest problems in modern human society. Thought experiments depend upon the development of proper hypotheticals that take reality into account and employ the closest analogies for purposes of understanding. Though many thought experiments have become famous, they tend to be viewed by scientists as interesting for developing explanatory clarity, but not particularly useful for actually "doing" science. The process remains scattershot; occasionally employed, mostly in psychology, but not developed to their full potential.

The purpose of the book from which this excerpt is taken is not just to create a historical background for thought experiments, but to show their use in clarifying models involving time, psychology, ethics, and even history. My hope is also that this essay will encourage caution in anyone who hopes to develop a thought experiment in any field of study. Thought experiments are delicate, their parameters can easily be torn down when new facts are discovered or a slight difference is found between the thought experiment and its real-world analog. Improper thought experiments can lead to the wrong type of decision making, particularly in politics and ethics. **S**



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5G Conspiracy Theories and Other Popular Delusions

BY SEAN KELLY

CONSPIRACY THEORIES OFTEN POP UP AROUND significant events, such as those that typically follow tragic school shootings. The bombing in Nashville, TN that happened in late 2020 was no different, with speculation swirling almost immediately. One of the biggest conspiracies attached to that incident was rumored to have been held by Anthony Quinn Warner, the man responsible for the attack.

Some reports speculated that Warner set off the bomb near an AT&T building because he believed that 5G was responsible for his father's death and wanted AT&T to pay for his loss. By the time the attack took place, there had already been conspiracy theories about 5G circulating around the internet, with people latching on to them and making claims about the dangers of 5G. Some believed it caused cancer, while others believed it harmful to trees and plants.

How many people truly believe conspiracy theories like the ones relating to 5G? InMyArea.com conducted a survey to get a sense of what people believe and don't believe when it comes to tech conspiracies, and the results were at once revealing and disturbing (<https://bit.ly/2QUTY8t>). To conduct the survey, the team used the Amazon Mechanical Turk system to collect respondents, who had to report being aware of 5G to qualify for the survey. In total, 991 people were surveyed—42% women and 57.1% men. Three respondents were nonbinary and three respondents chose not to disclose their gender. The average age of their respondents was 38.5 with a standard deviation of 12.2 years.

5G Theories

Among the nearly 1,000 people who took part in the survey, an astonishing 24% said they believed at least

one 5G theory to be true. The theory that most people surveyed had heard of was the cancer conspiracy, with 50% saying they were familiar with it, though only 10% of those said they actually believed it.

Other 5G-related conspiracies that respondents were asked about included one claiming that 5G causes or exacerbates COVID-19. Of those surveyed, 36% said they were familiar with the theory, while only 6% said they believed it to be true. (The conspiracy theory contends that the energy from the 5G towers weakens human immune systems thereby making them more susceptible to the disease caused by the SARS-CoV-2 virus.)

Another 5G conspiracy that made the rounds on the internet suspects that Bill Gates was using 5G to track Americans, which 35% of respondents had heard, and 13% believed to be true. (Believers in this conspiracy theory seem to forget that tech companies are already tracking Americans through their cell phone activity!) Lesser-known theories around 5G included one claiming it can cause autism, which 22% had heard, and 10% believed.

In addition, according to the survey, two-thirds of respondents said they first heard about a 5G conspiracy theory in the last year, with the internet by far the most common source, in particular online communities being the most popular. Others said they heard about 5G theories from family or friends, a regularly read publication, or through their own research. The InMyArea.com study also notes that much of the fear surrounding 5G is rooted in a distrust of science and technology—particularly from those who believe the theories about 5G being used for brainwashing and control. There is also an apparent lack of understanding of 5G technology, with a recent survey cited in the study saying that one-



third of Americans didn't even know if their cell-phone had 5G.

It's worth noting that 5G conspiracy theories actually predate the pandemic, though they've been circulating much more rapidly since COVID-19 hit the United States. A 2018 report from *Vice Media* cited an alt-right conspiracy theory around 5G technology, which claims that 5G network plans were a deep state conspiracy headed by Google (<https://bit.ly/3vvBHoE>). The 5G conspiracy theory, by the way, is most directly refuted by the fact that most people who contracted the disease live or work nowhere near 5G towers and that there is no disease "cluster" effect around towers.

Using 5G

Though 5G conspiracy theories thankfully tend to remain relatively marginalized, the question still persists whether these theories have impacted people's willingness to use 5G. Despite the fact that 70% of respondents in the InMyArea.com survey said they haven't switched to 5G yet, it seems that this might have more to do with not upgrading to a 5G-sup-

ported device rather than buying into conspiracies.

Interestingly, the study showed that 40% of those who believed a 5G theory are currently using the technology despite their beliefs, although 64% of respondents who said they believed in a 5G conspiracy said they hadn't yet upgraded, although it isn't clear why, and 7 in 10 respondents said they thought they were somewhat likely to upgrade to a 5G device in the next 12 months. So the consequences of believing in 5G conspiracy theories may or may not be detrimental to the development of the technology. And it is good to remember that conspiracy theories nearly always arise around new technologies, then usually fade after general acceptance and widespread use of said technologies. Recall the swirl of fears and conspiracy theories around cell phones in the 1990s when it was claimed that they cause brain tumors from people holding them up to their ears. Those theories were refuted (cell phones don't generate enough energy to penetrate the skull and break the molecular bonds of cells to cause tumorous growths) and today billions of people use cell phones.

The Reality of 5G

When it comes to alleviating fears held by those who believe in these theories, it really comes down to trusting science. That won't help everyone though, and there have naturally been questions—conspiracies aside—surrounding possible health risks posed by 5G technology. “We first need to see how this new technology will be applied and how the scientific evidence will evolve,” European Commission's Cabinet head Vytenis Andriukaitis said in 2017 about the emerging technology as it pertained to Europe, CNN reported (<https://cnn.it/3fLoeuM>). “Rest assured that the Commission will keep abreast of future developments in view of safeguarding the health of the European citizens at the highest level possible.”

With 5G, the concerns from conspiracy theorists relating to health often have to do with radio frequencies, though CNN reported that 5G networks actually operate at basically the same frequency range as existing 4G networks. 5G frequencies all fall within the same risk factors as 4G where the skin is a strong enough barrier. “It's a little ironic that there's all this worry about 5G, because the difference is that 5G is going to operate at higher frequencies,” NYU radiology professor Chris Collins told the network. “It will actually not penetrate as deep into the body...it really doesn't get past the skin.”

More Telecom Theories

In addition to 5G-related conspiracy theories, others are floating about cyberspace. One of the biggest, perhaps unsurprisingly, is the theory that the iPhone secretly records conversations without permission, with 60% of those surveyed having heard this conspiracy, and 46% of those said they believed it.

The longstanding conspiracy theory that the moon landing was faked was the most commonly-known out of all the theories referenced in the study, with 65% saying they'd heard of it and, encouragingly, only 8% saying they believed it. Other known theories referenced included conspiracies that vaccines are used to implant tracking chips; lizards have human DNA that has been altered; the U.S. government uses antennas for mind control; and oil and gas companies are suppressing electric cars. This later conspiracy theory was among the most believed of all that respondents were asked about, with 44% of the 39% familiar with it saying they believed it. That is astonishing given the fact that every major automobile manufacturer either has or is developing electric vehicles, and many states are mandating that all vehicles be electric in a matter of decades.

Government Regulations and the Future of 5G

As technology evolves, there do seem to be political lines being drawn when it comes to how the government regulates the telecom industry. InMyArea.com's survey showed that most people, despite political affiliation, are comfortable with the current amount of regulation, though conservatives were more inclined to want less government regulation of big industries, while liberals wanted more so that major corporations can't monopolize the world of technology.

A recent article from CENG (Canada's Centre of Excellence in Next Generation Networks) debunking 5G conspiracy theories made a strong case for the future of 5G—something that people should take comfort in, especially in this era of misinformation we're living through (<https://bit.ly/3wD95mi>). “In terms of use cases, 5G will transform the way we utilize technology in every industry. For example, picture augmented reality in classrooms for emergent learning or having the capability to do massive data transfer across hospitals instantaneously when every second counts,” the authors explain. “This is not even mentioning ushering an era of automated sensor-based technology, enabling driverless cars that will reduce the number of collisions to zero, smart buildings and cities that are more environmentally friendly and cost-efficient, even sensors that will allow us to protect our wildlife and national parks by accurately predicting dangerous weather conditions before they happen.”

The CENG article—a point-by-point refutation of 5G conspiracy theory claims—emphasized the importance of fighting conspiracy theories by spreading facts and truth as much as possible. “The protests and destruction being fueled by 5G conspiracies must be combatted (sic) with facts highlighting the true nature and purpose of 5G. As technology continues to grow, the network needs to grow with it. This is why it is essential to understand that it is not a danger to us, but an ally. We need 5G networks to support continuous technological innovation and our connected way of living.”

All told, 5G technology appears to be a safe and effective way forward. Conspiracy theories about it will likely go the way of most conspiracy theories about new technologies and will quietly disappear. Despite the fact that many people seem to believe some of these theories, science and facts will in the end outweigh these claims and put them to rest. **S**

The Paradox of Free Will

BY DENNIS MIDDLEBROOKS

SKEPTIC MAGAZINE HAS FEATURED SOME INTERESTING articles recently on the issue of “free will.” Similar articles in the past have appeared in *Free Inquiry* and *The Humanist*. What I have long found interesting is the tendency of writers who claim there is no such thing as free will to act as though that they themselves and the readers of their articles they are hoping to convince are possessed of free will, and are free to take corrective, humane measures to improve society. Their deterministic arguments are usually intended to justify lax criminal codes and/or call for judicial reform based on their conclusion that the perpetrators had “no choice” but to act as they did.

Of course, if the readers, as well as many others, instead reject pleas for reform, and even call for more draconian laws against crime (burn those pot smokers at the stake!), that could also be excused on the grounds that they had no choice in the matter. But it never is. The assumption is they have the same free will as the authors who claim there is no free will. Apparently the only segment of the population lacking free will is the criminal element.

I have come to the conclusion that the whole debate over free will is moot, since nothing actually changes as far as actions are concerned. Consider two examples.

Under determinism, the slaveowners of the Antebellum South and the Nazis who perpetrated the Holocaust had no choice but to act as they did, just as the abolitionists and the judges at the Nuremberg trials had no choice but to oppose slavery, often violently, and to impose harsh sentences on the Nazi war criminals. Indeed, determinism would excuse the perpetrators of every atrocity in human history, as well as account for every humane act.

Under free will, the slaveowners of the Antebellum South and the Nazis who perpetrated the Holocaust exercised their volition in acting as they did, just as the abolitionists and the judges at the Nuremberg Trials exercised their choice in opposing slavery, often vagariously, and by imposing harsh sentences on Nazi war criminals. Free Will would condemn the perpetrators of every atrocity in human history, as well as condone every humane act.

What changes in either scenario, apart from the question of responsibility? John Brown still hangs and Albert Speer still gets 20 years in the slammer under determinism or free will. I personally believe in free will and reject determinism, but if I am wrong, I had no choice and I would still reject it. *La même chose, non?* **S**

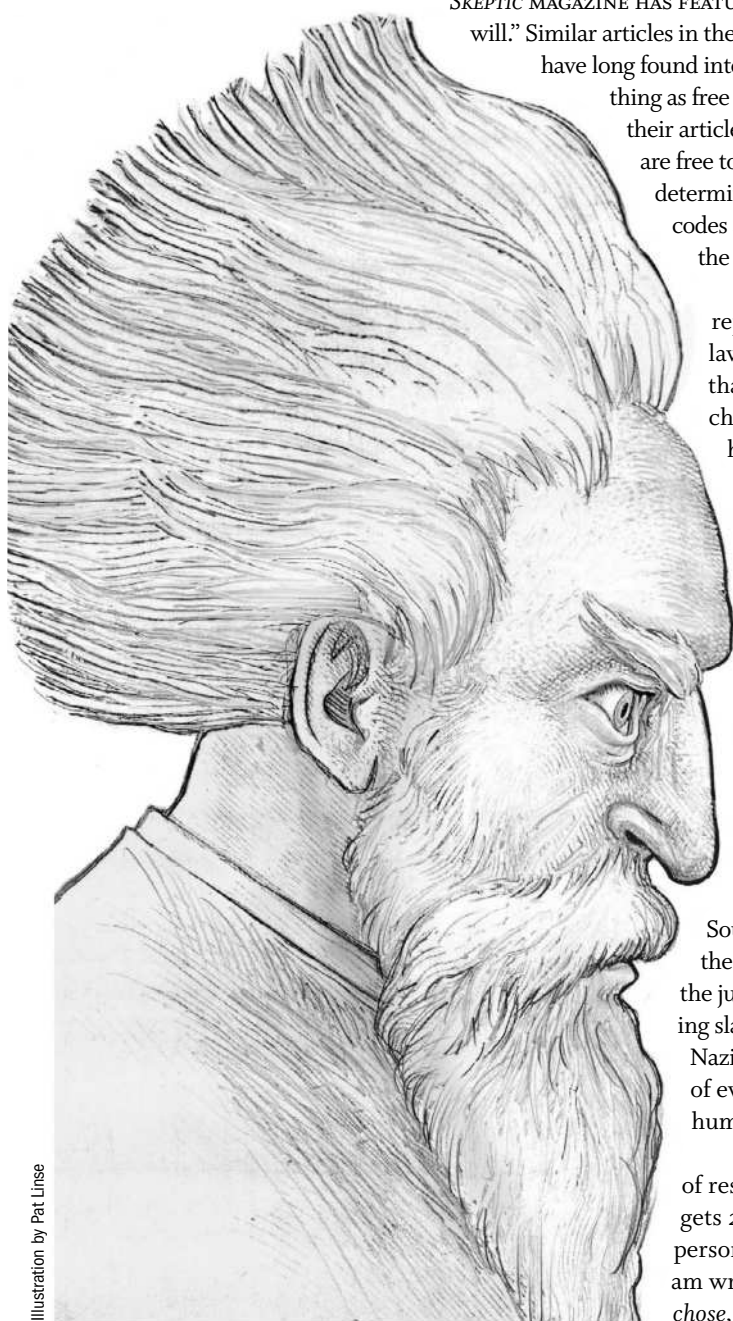


Illustration by Pat Linse

Inequality: Why Women?

A Plausible Sociocultural Explanation for the Persistence and Universality of Gender Inequality Over Thousands of Years

BY DOLORES NEWTON AND JEFFERSON M. FISH

IN 2020 NETFLIX AIRED THE FOUR-PART MINI-SERIES *Unorthodox*, loosely based on Deborah Feldman's memoir of the same title, depicting the flight of a young Satmar Hasidic Jewish woman from her arranged marriage in the insular and oppressive ultra-orthodox community in Brooklyn where she had grown up, to a life of freedom—albeit alienated from her family and that social world—in Berlin, previously the epicenter of the Holocaust.

As we watched the series, we were reminded of similar gripping memoirs of women escaping from extreme forms of other religions. Ayaan Hirsi Ali's *Infidel* (followed by *Nomad* and *Heretic*) described her escape from a Somali version of Islam—which included her suffering genital mutilation—to avoid an arranged marriage and find freedom and education in the Netherlands. Amber Sciorah's book *Leaving the Witness* chronicles her exit from her family's three generations of devotion to the Jehovah's Witness religion that left her in Shanghai with no education or support system, and what it was like starting her life over that eventually led her to pursue education and a new life in New York City. And Tara Westover's memoir *Educated* described her exodus from a school avoiding survivalist Mormon family in rural Idaho. She endured physical dangers, physical abuse, and coercive psychological control in a determined effort to achieve an education, even though it would challenge her most deeply held and unquestioned beliefs; and she ultimately received a Ph.D. in history from the University of Cambridge.

We began to wonder whether these memoirs constituted a new literary genre or subgenre. Despite the differences of language, culture, geography, and religion, the stories were basically the same. A woman grows up in an insular religious community, where formal education is denied to women (reminiscent of the way American enslaved people had not been allowed to learn to read and write), where contact with the larger world is minimized, where she has a status greatly inferior to that of men, and where her predetermined life path consists of sub-

servience to religious and other community norms, and to the roles of childbearing, infant care, childrearing, and homemaking.

Were these works actually part of a pattern? Was this primarily a phenomenon of women, or of religious extremism, or was it part of something larger—of inequality in general? And if so, where does gender inequality fit in? These are the questions that prompted this article and that it aims at exploring.

Of course, it isn't only in extremist forms of religion that people in the category of women find themselves in inferior positions to those in the category of men. While not discounting the possibility of rare exceptions, it is fair to say that gender inequality characterizes religions in general, in differing ways and to differing degrees. Religions (and secular ideologies with the same function) are important because they serve as the justification societies use for the social order they impose, including the conferral of power and privilege. However, religions are not the only place where women as a category of humans find themselves in an inferior position to the category of men.

All societies have categories of people who are treated poorly, but these groupings vary widely from one place and time to another. Religion, race, social class, caste, language, ethnicity, and other classifications have been used to justify the unequal treatment of identifiable groups of people. And yet only gender serves as the basis for unequal treatment in all societies in all places and at all times. Why is that? And where does the universality of women's lesser power and status fit into the overall picture of inequality among humans?

In considering these questions, we have attempted to restrain ourselves from censoring even extreme forms of inequality, choosing instead to describe reality as it exists and has evolved over time. The following brief discussions of gender inequality and social evolution summarize consensus understandings among anthropologists and other social scientists (we are, respectively, an anthropologist and a psychologist).

Myths About Matriarchal Societies

To begin with, we can dismiss myths about women's domination of some societies in faraway places and/or in the distant past. While women may have been respected elders and sources of wisdom about a society's rules, there is no documentation of a society where women called the shots. This is a fact that has repeatedly required explanation, even for the peoples themselves—taking the form of myths about the way women once ran things, but messed up badly, so men took over and set matters straight.

The first and most obvious biological (as opposed to social) explanation is that men run things because on average they are bigger, stronger, and more aggressive than women. This explanation is what most people assume explains gender inequality; and their assumption becomes explicit, especially when it is challenged by a woman. However, this ancient assumption has been examined and shown to be false. As we look at societies around the world, it is evident that the people at the tops of the hierarchies of power and privilege—while overwhelmingly male—are rarely the strongest men; the physical strength of those at the top was rarely of much use in getting them there; and by the time they arrived, they were past their physical prime. Furthermore, their social skills—at which women are thought to outdo men—were key in getting them to the top.

An appeal to humans' past as hunter-gatherers provides little support for the physical strength hypothesis. To begin with, although physical strength may have been more important then than in later forms of social organization, hunter-gatherer bands typically had much greater gender equality than can be found in nation-states today. In large measure, men and women were equal because moving around following plant and animal food sources meant that a group couldn't carry much stuff with them, so there wasn't much material wealth to distribute unequally.

Over time, research has displaced the image of "man the hunter" to one of "woman the gatherer," since plants were the main source of food. It is true that males and females did different things, and that men's activities may have been more highly valued than women's, but these differences didn't translate into large differences in power. Rather, the band was more like an extended family, where relatives worked together for mutual benefit (and where a subgroup could split away if the level of conflict became intolerable). The limited gender inequality among hunter-gatherers, however, offered a basis for subsequent more hierarchical societies to build

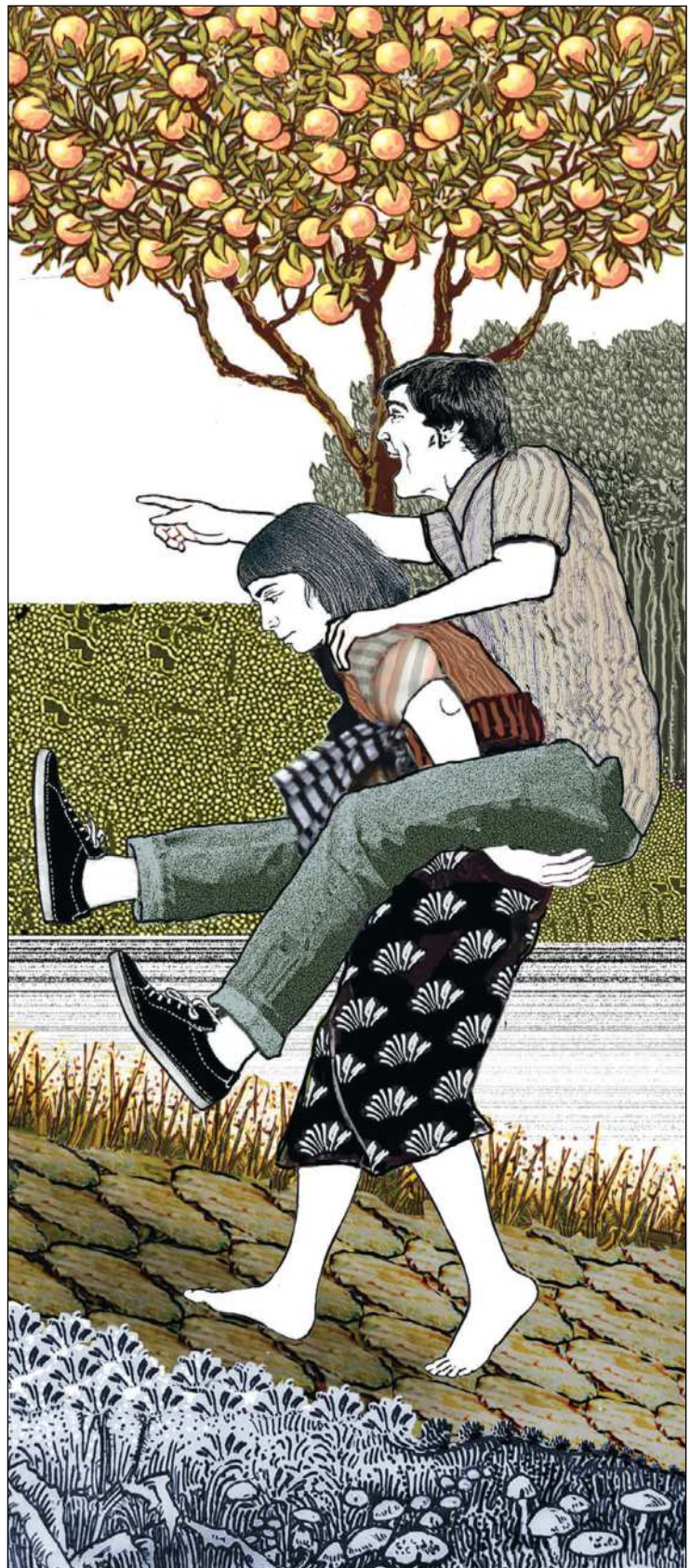


Illustration by Pat Linse

upon. This is an important point—once a cultural system of beliefs and practices gets entrenched it tends to take on a life of its own, even when it has outlived its usefulness.

A second biological explanation for male dominance is that, until recently when people began to live longer and could use methods of birth control, women's lives were taken up by pregnancy, childbirth, and infant care, in addition to their other responsibilities, leaving little time or energy for dominating the affairs of the group. In addition, in the case of hunter-gatherers, a man who got isolated from the group could survive, while an isolated woman with an infant could not. Thus, among the earliest humans, women did need men to survive more than men needed women.

The problem with using women's reproductive and infant care responsibilities to explain the subsequent perpetuation of gender inequality can be seen by looking at our two nearest cousins, chimpanzees and bonobos. In both species, as in ours, males are stronger than females; but in the case of bonobos females rule the social group. They do so by banding together, so that their combined strength is greater than that of any male—and the males tend to be solitary. Interestingly, it is the females' infant- and childcare responsibilities that lead them to band together, rather than making them subservient to the males.

What then can we say about the apparent universality of male dominance? Since human biology is a constant, while the degree of inequality differs greatly among societies (and even in the same society over time), we can conclude that the effect of sociocultural factors is powerful. Because men are one-up in all societies, it is possible that biological differences between the sexes (such as men's strength and women's pregnancy and infant-care) may in the distant past have contributed to an initial difference in power. This initial difference would have had the kind of advantage that any prior custom has, but it would not be adequate to explain its ongoing existence and even amplification in today's complex societies, millennia later. On the other hand, neither has anyone come up with a plausible sociocultural explanation for the persistence and universality of gender inequality over thousands of years.

We would like to propose one.

A Brief History of Social Inequality

To a greater or lesser extent, all documented human societies are hierarchical. Hierarchy can be under-

stood as a response to a variety of environmental circumstances, such as a surplus of food, role specialization, or the structural need for some category of people to oversee and coordinate the actions of others who perform disparate tasks. Over time, different groups organized themselves in a variety of ways, each with its own variety of inequality. The following condensed summary gives a glimpse of our species' past.

The earliest humans were hunter-gatherers. Depending on whether you date our species as beginning with the cognitive revolution, anatomically modern bodies, or common ancestry with our closest living ape relatives, our hunter-gatherer ancestry extends back tens of thousands, hundreds of thousands, or millions of years.

The most widespread and dominant form of human social organization on the planet evolved over time—from hunter-gatherer societies, to horticultural societies, to agricultural societies, to industrial societies. Whenever a later occurring form was introduced in a particular geographical location, any earlier form would disappear. (We should note that no other primate species has societies that are larger or more complex than human hunter-gatherer bands. Also, to say that the forms of society evolved through a kind of environmental selection doesn't imply that a given society has to go through all the intermediate societal types before becoming industrialized. In addition, other social forms—fishing, herding, and maritime societies existed at different times; and the conquests of Genghis Khan's herding society created a gigantic empire. But herders were never the most widespread societal form on the planet.)

Horticulturalists first appeared about 9,000 years ago, agrarian societies about 5,000 years ago, and industrial societies about 200 years ago. Horticultural societies planted crops, which produced more food, allowed for a surplus to be stored for lean years, and created multi-village societies. These advantages allowed them to out-populate, conquer, and displace hunter-gatherers. But horticulture tied people down to the land—inevitably leading to competition among groups over land and the creation of warriors and specialists to make weapons and farm implements. Warfare in particular lowered the status of women, since it combined the two elements alluded to earlier (and dismissed as biological causes for gender inequality).

The continuous female cycle of pregnancy, childbirth, and infant care during the brief lives of early peoples made women less available as warriors, while men's greater strength and hunting skills were assets

for that role. In addition, organized warfare involved a level of social organization not seen in chimpanzees or bonobos. Since the control of violence was in the hands of men, they became the group in charge; and they have perpetuated that power advantage through the millennia.

In addition, under early small horticultural societies, slavery often came about through taking prisoners in warfare. A slave populace served both as a source of labor for menial tasks in times of plenty, and as an expendable population in times of food scarcity. Slavery became more widespread in situations where societies with a slave component had an advantage over non-slave ones.

An important point here is that throughout history humans (and other species) have gone through periodic episodes of food scarcity and starvation; and human societies have developed means for institutional self-preservation. In addition to organized groups of male warriors, horticultural societies with cultural practices like infanticide have also had an advantage over those that did not, since fewer mouths to feed meant more food per mouth, and hence a greater chance that the group as a whole would survive and not self-destruct in disputes over limited resources. Slavery, in its earliest form—by providing an expendable population—functioned to preserve the slaveholding society against internal collapse. In later, larger, and more complex horticultural societies, the advantage of slavery came by incorporating potential competing groups into an exploitable category within the conquering society, and by taking their resources.

This is a key point about inequality. The exploitation of a category of people, a characteristic of hierarchy, can produce a benefit and even a survival advantage for a given society in competition with others—leading to a selection over time of societies with comparable practices.

Agricultural societies, with plows and irrigation systems, were huge and hugely complex in comparison to previous forms of social organization. They had cities of over 50,000 people, and while the percentage of such societies with slavery declined, the actual number of enslaved people increased dramatically because the societies were so large. In addition, class systems came into existence and became the form of inequality affecting the most people.

The world's largest religions developed before the industrial revolution and still have billions of adherents, illustrating the way in which complex cultural practices can continue for centuries or even millennia after the circumstances that gave rise to them have ceased to exist. Thus, in addition to the subordination

of women, we see slavery in both the Old and New Testaments, reflecting conditions in the Ancient Egyptian and Roman agricultural empires. And the monotheism of the Jews harkens back further to their life as herders, viewing God as standing in relation to them the way a herder controls his animals. ("The Lord is my shepherd.")

Periodic starvation posed a particular problem for gigantic agricultural societies like China and India, and the practice of female infanticide prevented the overall losses from being even worse. (In recent decades, following the availability of amniocentesis and ultrasound, this practice has been largely replaced by the selective abortion of female fetuses.)

Given the fact that only females give birth to babies, it follows that those societies that limited the number of females were more effective at controlling population size than were societies that did not. This is because a man can impregnate many women in a short period of time. For example, it is estimated that 0.5% of all men now living—between 15 and 20 million—carry Genghis Khan's Y chromosome; and he died less than 800 years ago. So, not that many men are needed to make a population grow. In contrast, a woman can give birth to only a small number of children, so many women are needed for population growth. Put differently, if you kill a boy baby, other men can still father the children he might have had; but if you kill a girl baby, you prevent the births of her children, and her daughters' children, and her granddaughters' children, and so on through the generations.

Of course, unlike slaves who constitute a disposable category of people during hard times, significant numbers of fertile women always have to be kept alive in order for the society to reproduce itself. Still, once a view of female inferiority becomes established through a practice like female infanticide, it opens the door to all kinds of derivative effects, which can take on a life of their own—even if the initial function—avoiding societal collapse in the face of starvation—is no longer relevant. If females are so worthless that society would keep them from living, then all kinds of mistreatment—from unpaid work to physical violence, rape, honor killings, and dowry killings—become less unacceptable. For example, even if, in the distant past, the function of female infanticide in India may have been population control, people today are unaware of that origin. Rather, the dowry system provides an economic incentive for getting rid of girl babies—parents won't have to pay other families to take them.

Industrial societies used the developments in science to harness the powers of nature, such as the steam engine to power railroads and steamships mak-

ing the United States and England powerful empires, and led to the rise of factories that moved masses of people off the land to ever larger cities and creating a gigantic urban working class.

As a byproduct of industrialization and urbanization, slavery became largely obsolete—slave labor was not well suited to work in factories, and the diminished economic incentive allowed arguments about its immorality to become more salient. Still, it took a protracted struggle to overcome this superannuated institution, illustrating once again that entrenched cultural practices do not disappear of their own accord. This is because, despite their counterproductive effects for the society as a whole, many powerful people and groups still benefit from the practices, and change in itself is viewed negatively by many others.

We can see the historically and geographically accidental and pragmatic ways that categories of exploited people have been created. Horticulturalists conquered and enslaved the people next door instead of others far away; agricultural colonists from Europe who settled in the eastern part of New World imported slaves from faraway Africa because the local populations lacked the large numbers and disease resistance needed; and British industrialists got their factory workers from the peasantry because that is where people in the requisite numbers could be found. There was nothing inherently inferior about the oppressed categories of humanity. Ideological justifications for the legitimacy of their exploitation were provided after the fact to sustain and perpetuate the newly imposed forms of inequality. In other words, people weren't exploited because they were believed to be inferior; their presumed inferiority was constructed after the fact to justify their exploitation.

As societies became ever larger and more complex, they benefitted from the social evolutionary advantage of hierarchy, and they contained ever more hierarchies with ever more layers. And, as we have seen, hierarchy means that some category of people has to be at the bottom. To use a popular computer metaphor, inequality is a feature of human societies, not a bug.

Why Women?

So, we return to our original question—why women and why in all societies?

In order to subordinate a category of people they need to be identifiable, so easily recognizable sensory information is of key importance. Since vision dominates the other senses in human perception, obvious visual cues are the most commonly used tool for classifying people into categories. The clearest current ex-

ample is that of race.

What people look like varies gradually around the planet, with populations near each other looking more similar than they do to more distant populations. If you go in different directions, the people look different in different ways. This pattern of gradual change, as opposed to clearly demarcated types, is why the human species lacks biological races—but if races did exist, they would all be in Africa, where our species has been since its earliest beginnings.

The illusion of race in the United States was created by the accidental bringing together of peoples from three of the most distant populations on the planet, who therefore looked noticeably different from one another. Beginning with the origin of anatomically modern humans in East Africa at least two hundred thousand years ago, different populations migrated from there over many thousands of years all the way to England, to West Africa, and, by way of Northeast Asia, all the way to the Eastern shore of North America. These populations' adaptation to differing climates included superficial differences in visible appearance. Since these obvious visible differences could be used to categorize people, it was easy to develop ideological rationales to justify taking the labor of Africans and the land of Native Americans, and to implement systems of law to crystallize the American forms of inequality.

Visible cues are so useful in classifying people, that they have even been created by societies where none exist. For example, the Nazis made Jews, Roma, homosexuals, and those in other stigmatized categories wear special armbands, since they could otherwise be visually indistinguishable from the general population.

Auditory cues have also been widely used—different regional, ethnic, and social class accents allow native speakers of a language to know where a person fits in a country's hierarchy. For example, Americans learned at the first presidential impeachment hearing that Fiona Hill immigrated to the United States because her British working-class accent would have prevented her from professional advancement in the United Kingdom. Similarly, a Spanish accent could be sufficient to provoke discrimination in the United States. In general, however, learned auditory cues, like an accent, are easier to change from one generation to the next than are inherited visual cues, like skin color or sex—making auditory cues a less reliable way of identifying a category of people over time. So, this is our proposed explanation for the ongoing universality of the subordination of women.

In all societies, women are a category of people who are easy to identify visually (e.g., secondary sex characteristics like breasts), and hence can be treated differently from oth-

ers (men)—with little danger of misclassification (“passing for male”) and no danger of a shortage.

Furthermore, unlike skin color, which can vary greatly across generations through mating, biological sex remains for nearly everyone divided into two separate categories. All societies can count on producing an ample supply of women, roughly equal to the number of men, in every generation; and all societies have had some pre-existing forms of inequality—including gender inequality—to build upon. Rather than asking what it is about women (or blacks or any other group) that justified putting them in an inferior position, we should examine the ways in which the groups already in power saw an advantage in doing so. In this sense, women can be seen as an omnipresent target of opportunity, whose availability for exploitation has been taken advantage of—in differing ways and to differing degrees—in all historically recorded societies.

(In the United States, although women greatly outnumber African Americans, African Americans got the vote long before women—though under segregation it was denied to them in the South for nearly a century—and an African American man was elected president, while to date no woman has been. In addition, while men are also visually identifiable and might in principle have been subordinated if women had been running things, it was women whose initial disadvantage got amplified over eons in the competition among societies.)

This explanation—of women as a numerous and visually identifiable category of people to exploit—seems so obvious to us that we wonder why we haven’t come across it before. We think that the answer lies in the difference between an insight in the social sciences and an insight in the other sciences.

Insights in the Social Sciences

In the biological and physical sciences, a significant barrier to a new idea is the amount and depth of knowledge that has to be acquired in order to put previously unrelated elements together to form a new pattern. And in order to understand the insight, other scientists need to have much of the same relevant knowledge.

In the social sciences, a significant barrier to a new idea is ethnocentrism. Ethnocentrism in the social sciences is like egocentrism in psychology. In egocentrism, people are unaware of obvious things about themselves in part because they are unable to observe themselves from the outside, to see themselves as others see them—for example, you can’t see

the expression on your face. In ethnocentrism, people are unable to observe their culture from the outside, to see themselves as people from other cultures see them—for example, in the United States, women don’t need written permission from their husbands to travel alone or with their children—as is the case in many other countries.

Here is an example of a social science insight from the educational anthropologist John Ogbu, whose focus was on another variety of inequality. Ogbu was interested in understanding the poor school performance of minority group children. First, he recast the question into a broader one—Why do children of some minorities do poorly in school, while children of other minorities do well? Then he came up with his insight. He made the distinction between voluntary and involuntary minorities. It is easy to understand once you hear it, but before him no one had thought of it. (Perhaps Ogbu’s personal experience, as both a member of the involuntary Igbo minority in Nigeria and a voluntary member of the black minority in the United States, combined with his anthropological training, gave him the background that enabled him to have his insight.)

Voluntary minorities are those who joined the majority culture, often at great personal and economic cost—seeking a better life or fleeing persecution—and accepted their minority status. Involuntary minorities, like conquered or enslaved peoples, have had their minority status thrust upon them against their will, and do not accept it. As a result, involuntary minorities are open to accusations of disloyalty, and have the additional burden of proving their trustworthiness.

Since one of the main functions of schools is to socialize students into the majority culture, voluntary minorities tend to view formal education as an opportunity to succeed in their new home. In contrast, students from involuntary minorities (e.g., Native Americans and African Americans) tend to view formal education as indoctrination by their oppressors. Ogbu found examples of immigrants from the same culture who did well academically in countries where they were voluntary minorities, and poorly where they were involuntary minorities. For example, ethnic Korean children have done poorly in schools in Japan and well in schools in the United States.

So, we see viewing women’s sex as creating a visible category of exploitable people—similar to the way skin color created the exploitable category of race—as the same kind of social science insight as Ogbu’s distinction between voluntary and involuntary minorities.

Potential Criticism

Whenever a new idea is proposed, it gets scrutinized and critiqued to test its cogency, so we would like to briefly imagine a few potential objections and give a sense of how we would respond to them.

Critique: The assertion of a social cause for gender inequality (that women form a visible category) as opposed to a biological cause is not testable because biological sex and social gender go together.

Response: We would say that some biologically intersex people are raised in one gender and then, at puberty, develop a body more like the other. Before puberty, the way society treated them was based on their visible appearance, not their biology.

Critique: What does the view of women's sex as creating a visible category of exploitable people have to offer in explaining social inequality over explanations relying on social learning alone?

Response: We would argue that the difference is in the level of explanation. Social learning is a process that takes place at the individual level, while a phenomenon like gender inequality requires an explanation at the societal level. Children may learn to distinguish males from females at the individual level, but the patterns that their parents and others transmit to them exist at the societal level and are communicated through language and other widely shared social processes.

Critique: Various biological or biologically associated differences between the sexes, individually or in combination, are sufficient to explain gender inequality. These include differences in physical strength, height, aggressiveness, testosterone, male bonding, women's menstruation, pregnancy, birth, lactation, infant care, and so forth.

Response: In our view, in the absence of actual evidence, this is basically an argument from correlation to cause. (It also resembles myths that women once ran things but weren't up to the job—in this case for biological reasons—so men took over.) Furthermore, when two scientific explanations are proposed for a phenomenon, the principle of parsimony (Occam's Razor) asserts that we should choose the simpler one, because it makes the fewest unsupported assumptions or assumes the existence of the fewest entities. In general, social explanations, which don't need to postulate innate differences, are simpler than biological ones, and therefore preferable. Biologi-

cal differences result at least in part from a long history of evolution, while social differences can be learned and/or changed from one generation to the next.

For example, it is simpler to propose that behavior such as gender roles gets passed down through the generations by social learning than to argue for a genetic cause without identifying the relevant genes. We recognize that there might have been limited gender inequality among hunter-gatherers in the distant past. But in the absence of evidence of biological causation, it is simpler to explain both its existence through time and space and its extreme variability from one society to the next by means of social processes, including transmission across the generations, rather than by biological causes. *Just to make matters clear, we are not saying that biology plays no role in male-female differences. Rather, we are arguing that it is unnecessary to postulate a biological cause for gender inequality at the societal level.*

Gender, Race, and New Forms of Inequality

Once a particular pattern of inequality has been established in a society, it tends to become entrenched and self-propelling. This is because of the benefits it offers, such as free labor, both to the society as a whole and in its competition with other societies. In addition, the religious and/or other ideological justifications that have grown up around particular forms of inequality create a cultural consensus about their morality—or at least acceptability. Changing an entrenched pattern is difficult, but if the costs of exploiting a category of people outweigh the overall societal benefits, coordinated action for change has a better chance of succeeding.

We believe that technological changes originating in advanced industrial societies are mainly responsible for recent improvements in the status of women. In the competition among societies, intellectual contributions (as opposed to previous forms of industrial labor, like assembly line work) are now the main key to success. Thus, the disqualification of the female half of a society's intellectual potential is a much higher price to pay than is the loss of women's menial labor and exploitability. (We saw this kind of calculation during both World Wars, when the scarcity of American men necessitated permitting women to function in many previously male jobs; but gender inequality was restored when the soldiers came home.) In a parallel to the decreased economic value of slavery in the face of industrialization, the decreased economic value of the exploitation of women has allowed arguments about its

immorality to become more salient.

Modern technology also offers the opportunity to create new subordinate categories of people in addition to or in place of more traditional ones. China offers an instructive example. China's spectacularly successful industrialization allowed it to grow from an impoverished country that could barely feed itself to become the second greatest world power in only four decades. In order to achieve these results, it has created Dickensian conditions that are at least comparable to those during the nineteenth century industrial revolution in England that so appalled Karl Marx. However, since Communist ideology claimed that this progress was spearheaded by the working class, China needed a different huge category of exploitable laborers on whose backs its achievements could be built.

Over 290 million workers—more than a fifth of the country's population—have been streaming from rural areas to cities in search of work. In response, the government has imposed severe restrictions on migrants once they arrive at their destinations and has given them no protections either in their homes or at work. As a result, because of the illegality of their presence, this new class of internal migrants has become the essential illegal labor force. They suffer wretched working conditions, pitiful wages, and no social benefits; and they have no legal means to appeal their exploitation or organize to demand better conditions. In this case, China's digital infrastructure has helped officials to check on people's household registration—a reminder of the potential that advances in information technology pose for enforcing inequality. Even though (unlike race in the United States) the predominantly male members of this new class are not visibly different from the legal population around them, their residence in shanty towns and the auditory cues provided by their extra-regional dialects and accents makes them easily identifiable. Of course, if China's economic progress continues and the size of this category diminishes rapidly, the visible category of women will still be available to provide large numbers of people to exploit.

It was our discovery that internal migration was illegal in China that drew us to collaborate on this article. It was one of those moments of insight, recognizing that something taken for granted and unremarked upon in one's own culture was defined differently and played a central role in another, that demanded explanation. In this case, it was that the freedom to move from place to place in China has required government approval—a situation difficult to imagine in the United States. A government decree restricting movement is so antithetical to American values that its suggestion during the COVID-19 pandemic raised cries of

outrage. Part of Americans' cultural identity comes from the massive movement of pioneers and settlers to populate the continent, so a challenge to freedom of movement in the United States can be seen as parallel to a challenge in China to an equally strong and more ancient understanding—the place of women in the social hierarchy.

In the current globalized competition among industrial economies, having an exploitable category of people still provides a country with a competitive advantage. In this sense, China can be seen as leveling the playing field with the United States, which already has its own illegal category of migrant workers.

Latin American undocumented immigrants are so intrinsic to the American economy that, despite their being constant targets of opprobrium, their underpaid labor is essential to the economy and creates an economic incentive—both for those who exploit them and for the United States in its competition with China and other countries—for keeping them here as an exploitable underclass. Similarly, in China, rather than allowing free internal migration or clamping down on it, the government accepts the economic benefit from this exploitable source of labor and limits its oversight to periodic harassment to prevent workers from asserting perceived human rights. Since China has the digital tools and means at its disposal to track and control individuals, digital profiling can function similarly to racial profiling. In terms of international competition between the United States and China, we can also see the benefits to China from exploiting its internal immigrants as competing with America's benefits from exploiting undocumented immigrants. Internal migrants offer China an economic advantage comparable to that offered by African Americans throughout our history—from slavery to Jim Crow to current practices—augmented by Latin Americans and women.

The emergence of a new oppressed category of internal migrants in China is a reminder that an improvement in the lot of one category of people need not improve the mistreatment of others, and even that new subordinate categories may be created.

The Future of Inequality

There is no getting away from the fact that all nation states are hierarchical, that hierarchy means inequality, and that inequality means a small number of people at the top and a substantially larger number at the bottom.

While categories like religion, race, social class, caste, language, ethnicity, and other classifications have been used to put people at the bottom, these arbi-

trary distinctions come and go over time and space. Only gender, because it is always and everywhere visually identifiable, creates the universal opportunity for unequal treatment. This means that, if gender discrimination provides societies with a competitive advantage, others will be driven to imitate the practice. But it also means that, if technological advances make gender discrimination disadvantageous, over time competing societies will either become more egalitarian or will lose out.

Hierarchy provides a benefit to a society by giving those at the top the time and resources to innovate in ways that provide it a survival advantage in competition with other societies. For example, the United States spent a huge amount of money developing the science to put a man on the Moon during the Cold War; but once the conflict ended, it stopped funding the much less expensive superconducting super collider because politicians couldn't see how the knowledge it would produce could benefit the country in international competition. (We might mention in passing that the climate crisis and nuclear proliferation offer contemporary examples of ways in which cooperation among societies would benefit them, while competition poses an existential threat. Unfortunately, as we have pointed out, social practices generally continue long after they have ceased to be of use.)

So, there is an opposition between hierarchy—which produces more security and potential innovations for the society as a whole in competition with other societies—and attempts to provide the best quality of life for all individuals.

That being said, among the most technologically advanced societies, the proportions of people in different categories, and the degree of difference between the lives of those at the top and those at the bottom can vary dramatically. For example, the Nordic countries have rich people and poor people, but nearly everyone has access to food, clothing, shelter, education, and healthcare. In contrast, in the United States, a small number of individuals have more wealth than entire countries, while more than a sixth of the population lives in poverty.

Furthermore, in the United States, the category of people classified as Latin American includes more than half of over ten million undocumented people. Like illegal internal migrants in China, their exploited labor makes a huge contribution to the American economy—which would suffer greatly if they were expelled, but would create substantial costs in wages and other benefits to their employers, and higher prices for the public, if their residency were legalized; and their uncertain status confronts the country with the injustice

of their condition. As a result, they present the United States with a conundrum, and their fate is currently the subject of intense debate.

Rapid and synergistic advances in biology and computer science, like the horticultural, agricultural, and industrial revolutions of the past, offer the potential both for major new advantages for individuals and societies and for the creation of new subordinate classes. Emerging technologies create the prospect of making genes, political views, or other as yet unforeseen criteria the enforceable basis for exploiting new categories of people.

We can ask, what will happen to women as new categories of subordinates appear?

Around the world, we are now observing a transition in the status of women. As we see it, the willingness and ability of a society's dominant groups to give up or decrease the subordination of women depends on four factors. These are: the availability of other categories of subordinates; the number of subordinated people of use to those who dominate the economy and the appropriateness of their geographical distribution to their usefulness; the degree of entrenchment of the society's preexisting understandings of women; and the potential economic and other competitive advantages offered to the society as a whole by their liberation. (In contrast, the fact that practices such as female infanticide have morphed into gender selection by technological means merely reveals the perpetuation of preexisting hierarchies.)

Thinking about the question, what category of people will be worse off as the condition of women improves, brings us back to where we started: memoirs of women escaping from religious extremism, which subordinated their interests to those of the larger group. A key element in the memoirs was the women's education, and the liberating effect it had on them. Technological changes in society have given even cloistered women access to education, have provided an opening for them to learn about the world, and have allowed enterprising women to strike off in a new direction. Some even write memoirs about their experiences; and it stands to reason that those most subjugated would be among the first to speak out. So, it seems to us that, as educated women's lives improve, the condition of less educated people—especially men with their traditionally greater power and privilege—diminishes in comparison. Less educated men don't like that, and we have seen loud demands for a return to the *status quo ante*. Meanwhile, women using education to venture out on their own, in defiance of their predestined inferior status, may well be the social trend that has given rise to these memoirs. **S**

Expert Bullshit Detection

BY JOHN V. PETROCELLI

“You can fool some of the people all of the time, and you can fool all of the people some of the time, but you cannot fool all of the people all of the time.”—Abraham Lincoln

IF ABRAHAM LINCOLN WAS CORRECT, THEN THERE should be people who are rarely duped by bullshit. Who are these people? Can they help us understand the moments when critical thinking fails and how to overcome them?

These are the questions I’ve asked in my qualitative research on bullshit and bullshitting. It involves identifying expert bullshit detectors and understanding their styles of thinking.

From my research, I am convinced that there are many specialized, expert bullshit detectors in our midst. Through years of experience, they’ve “seen everything.” They’ve been witness to every bit of bullshit pulled in their respective professions and industries. They have highly specialized knowledge that makes it very difficult for people who don’t know what they’re talking about to get away with bullshit. We have much to learn from them. And so, I went out into the field to discover what they do differently from the average person. Here are two examples from my book—used car dealers and real estate agents—and some principles of bullshit detection that we can all apply to our lives.

Curtis Baker and Used Car Dealers

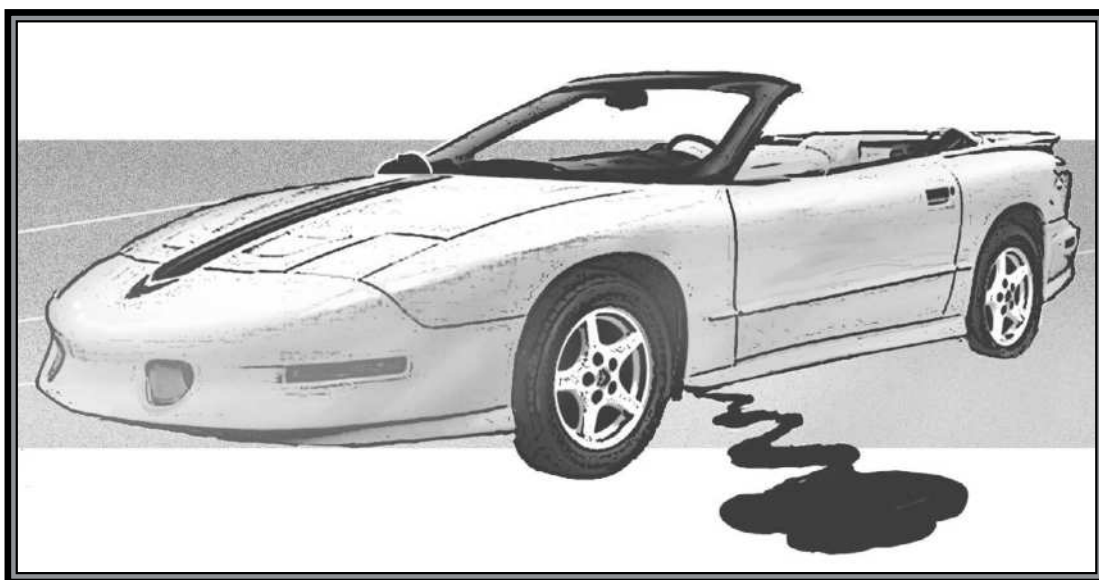
As an automobile hobbyist and enthusiast, most days Curtis Baker can be found working on an old car. I joined Baker while he refinished a 1995 Porsche 911 Carrera Cabriolet in his 60,000-square-foot warehouse. After discovering the car on CarGurus.com, he flew to Dallas, Texas, and drove it all the way home to Charlotte, North Carolina. I’ve never known anyone like Baker, who can work with tools, weld, talk, and eat spaghetti and meatballs, all at the same time. Baker is the perfect person to ask why car buyers are so often duped by used car dealer bullshit.

“I don’t think people are duped so much by direct bullshit from sellers. People are duped more by

the facts sellers don’t share with them. And only someone who doesn’t really want to sell is going to tell you something that would make you avoid the car. The seller of that sweet 2006 Mercedes-Benz SL500 with 50,000 miles isn’t going to tell you that soon enough you’ll need to replace the hydraulic suspension that will cost you anywhere between \$3,500 and \$5,000. Dealers bullshit by omission.” Baker believes that information omission is orchestrated by both sellers and buyers. The seller is not readily forthcoming, but the buyer participates by not asking the right questions. He believes that if buyers can demonstrate to the seller that they know what they’re talking about by the questions they ask, there is considerably less room for the seller to bullshit.

What are the questions that Baker asks himself and sellers when he’s interested in buying a car? Baker explains, “I ask myself, if I was to buy this car, how could I drive it for free for the next two to three years?” Baker never buys a car he knows he can’t sell at a profit later. He points to a 2010 Toyota FJ Cruiser he bought last year for \$16,000. “I will drive it for a couple of years, put miles on it, and still sell it for \$20,000 without doing anything to it. Why? Because I’ve done my homework on the Toyota FJ Cruiser. Not only are they not the gas guzzlers you think they are, but after 2014, Toyota stopped making these cars. So every day there are fewer and fewer on the roads. And when I’m ready to sell it, there will be even fewer. And people absolutely love these SUVs, so the demand will remain steady, but the supply will continue to diminish.”

Baker is convinced that every car has a price that would enable you to drive it for free. “You really just need to do your homework so that no seller can bullshit you into buying something you don’t really want. Almost every car model has an online forum you can check out for free. Say you’re still interested in that 2001 BMW X5. Get on the online forum and see what people who have the model are complaining about. You’ll find out real quick which models have crap parts and when common problems are likely to emerge. Doing your homework will also place you in a better position to develop a strong BATNA (Best Alternative to a Negotiated



Agreement). And when the dealer says to you, ‘You don’t have to be such an asshole,’ that’s when you know you’re getting a great deal.”

Whoever has a stronger BATNA—a better alternative—wins in negotiation. If you’ve done your homework and know everything there is to know about the make and model and invested some time to find multiple alternatives, then you’re likely to have a strong BATNA. Essentially, having a BATNA means having a viable plan B.

Don’t let dealers bullshit you into believing there is only one car for you. As the buyer, you have multiple dealers and cars to choose from. And with readily available alternatives from CarGurus, Autotrader, and eBay in the game, you have hundreds if not thousands of cars to choose from. Baker believes that one of the easiest ways to develop a good BATNA is to connect with multiple car sellers and “fall in love with” at least two cars—or as many as you can. Falling in love with that special one and only is fine when it comes to people, but not when it comes to cars and properties. Baker explains, “Falling in love with only one car or one house or one job is almost guaranteed to make you a sucker. Why? Because if you’re so head over heels with a single option, you have no choice but to submit to details of the deal made by the single seller—you have to accept whatever terms they’re offering.”

If you give the illusion that you’ve been swept away by another car at another dealer, then you are building some leverage for your BATNA. You will feel much more comfortable pushing back on the original, higher priced deal when you have this leverage. At a minimum, your homework will teach you something about the market for the car you want and cultivate your confidence when you try to sound like you know what you are talking about. Although there are more

sophisticated BATNA schemes, Baker claims there is no chance of driving a car for free without one.

When he has an eye on a car, Baker digs to discover its true value. That is, what are the total costs given the inevitable maintenance, risks, interest to be paid, insurance costs, and depreciation of the model? And what price would he likely get for the car when he’s ready to sell it? So many car buyers focus on the payments for four, six, or even seven years of financing. They focus too much on monthly payments and not enough on the true value and costs of the car. But as Baker explains, the right focus is to ask, “What are the objective facts concerning this car? What does the Carfax report say? If you see a collision on the Carfax report, you don’t want that car, because unless you’re planning on driving the car for the next ten years, you’re going to have trouble selling it with that red flag. Let’s say there was never any damage to the car, it has only 10,000 miles, and is only five years old, but has had seven different owners. The Carfax will tell you that, but you really don’t want it because it could be a hot rock and you don’t want to take a chance at holding it.”

Baker’s most useful recommendation for learning about a car is to ask the seller or dealer to take the car to a nearby, certified auto dealer to have a pre-purchase inspection done at your cost. Usually this runs about \$350, but it’s worth it. The dealer will look at everything closely and tell you about any problems. If the car has no problems, great. If the car has some problems, even better. You can use those officially reported problems as leverage with the seller. A pre-purchase inspection might sound excessive if you’re buying from a trusted dealer, but you don’t want to pass up this level of investigating and questioning when purchasing a used car. As Baker claims, “I’ve seen BMW X5s with only 35,000 miles and the trans-

missions fall right out of them. Because I will tell you, that oil that you see in a small puddle under the car, the dealer will just tell you that they just changed the oil and spilled a bit. Bullshit. Get the pre-purchase inspection and thank me later.”

Before buying a car, Baker also likes to get a feel for whether the seller will consider an absurdly embarrassing offer. He argues that one never knows what kinds of pressures sellers or banks are under. “You might only have a 5% chance of success with the absurdly embarrassing offer, but you’ll get a hit 5 out of every 100 absurdly embarrassing offers, and that’s equity you just earned. I’m always amazed at how many people don’t do this. And if you’ve done your homework and can actually sound like you know what you’re talking about, you might just remind the dealer why the car might be otherwise difficult to sell. If you bring up the fact that you’ll need to spend at least \$1,000 on four new tires when just one of the tires blows on that four-wheel-drive Cadillac Escalade, you can get the price reduced by \$1,000 just like that.”

Finally, Baker adds, “I ask myself: Is this an emotional buy I’m considering? Would this be an impulse decision? The one thing I avoid at all costs is to make an emotional or impulse buy. Base your decision on facts and reason and not emotion. The only time I’ve ever lost money on a car was when I bought a car on emotion. I always loved the 1994 Pontiac Trans Am. It had white wheels, and I just had to have it. But I had a hell of a time getting rid of it when it came time to sell. Dealers know fully well that people buy cars for emotional reasons. That’s why they want you to test-drive it. See what it feels like to ride in it with the top down. Feel its horsepower. Smell the leather. Imagine yourself driving off with it today. They really just want you to fall in love with the car so that they have some leverage in your decision. They are more than ready to give you a load of bullshit because, despite the fact that they may refer to themselves as a Customer Sales Consultant, A-Team Representative, Sultan of Sale, Sir Close-a-Lot, Sir Come Sale Away, or Mr. Miracle Worker, they are car dealers and their livelihoods depend on selling as many cars as they can. Don’t forget that.”

Christina Pryce in the World of Real Estate

With over 25 years of experience in the Lake Norman area just north of Charlotte, North Carolina, and as a 16-time winner of the Five Star Real Estate Agent Award, Christina Pryce is as knowledgeable and trustworthy as real estate agents come. She also happens to be an expert bullshit detector. I know

this firsthand, as both a buyer and seller. Her no-bullshit approach to real estate has literally saved me thousands of dollars.

One of the things that attracted me to Pryce is that she only holds five to six listings at any one time and doesn’t overwhelm herself with dozens of clients who are looking to buy a home. It comes as no surprise that 100% of her business is obtained by word of mouth referrals—she doesn’t advertise and has no web presence. This approach affords her time to study the market and fine tune her craft. As she notes, “I’m not a real estate appraiser, but I’ve taken an appraisal course three times. Things change over time in the real estate business.” She knows zoning laws and how to find appropriate houses for comparisons, as she explains, to “help” appraisers do their jobs. “People in this area often want to live on Lake Norman. When buyers ask if they could put a boat dock where there currently isn’t one, the vast majority of agents will say, ‘Sure thing, you can put a dock there.’ But most of the time they really don’t know what they are talking about. Lake Norman is a man-made lake built by Duke Energy to service their nuclear power plant—any docks must first be approved by Duke Energy, and their rules change all the time. It is heartbreaking to someone who buys a home on the lake only to discover they will never be approved for their very own dock. I avoid this altogether by doing my homework rather than bullshitting my clients.”

Her “spider sense” is founded on the recognition that bullshit is much more influential than most people realize. Pryce believes that appraising homes can be as subjective as valuing art. I find this somewhat disturbing. In an interesting study, cognitive psychologist Jonathan Fugelsang and his colleagues presented people with over 140 artist- or computer-generated abstract paintings and asked them to rate the profundity of each piece. Some of the paintings were tagged with art curator language known as International Art English (IAE). IAE is a style of communication commonly employed by artists and curators to discuss artwork. Rather than employing clear and concise language, IAE uses morphing verbs and turns adjectives into nouns (for example, potential to potentiality), pairs like terms (for example, internal psychology and external reality), and favors hard to picture spatial metaphors (for example, culmination of many small acts achieves mythic proportions).

In Fugelsang’s studies, abstract paintings included IAE titles such as “The Pathological Interior” or “Undefined Singularity of Pain,” mundane

titles such as “Canvas No. 8” or “Color Mixing,” or no title at all. The title had a remarkable effect. Those paintings tagged with IAE titles were rated as more profound than paintings tagged with a mundane title or no title at all.

The very same attempts to influence perception through language can also be found in real estate. Savvy real estate agents never use words that might convey negative things about a home they are listing. Cozy, dollhouse, or cottage might sound cute and whimsical, but usually these words are code for “very small.” Custom or unique might characterize the pride held in a home, but potential buyers tend to think “weird corners,” “tacky colors,” and “wild additions” when they see these words. Modern, vintage, and rustic can mean that a property makes you feel like you are stepping back in time, but buyers hear “ridiculously outdated.” “TLC” or “lovingly maintained” may sound to sellers like the home has so much “potential,” but to buyers it signals that a property needs serious work. The worst is “buyers to verify permits,” which is code for “unpermitted additions or conversions.” Instead, your realtor will use code words like “beautiful,” “turnkey,” “spacious,” “backyard paradise,” “open floor plan,” “redeemed to perfection,” and “suite.” Every realtor knows that when it comes to writing real estate ads, a surefire approach is to “sell the sizzle, not the steak”—and what often emerges is bullshit.

What most sellers don’t understand is that all of the coded language is really for other real estate agents who represent the buyers and understand their expectations. In the business of real estate, coded language must be accurately applied. As Pryce explains, “I don’t pull any punches in how I describe a listing I have for sale. If another agent shows up with interested buyers to see my listings and they don’t see what they’ve come to expect from my description, that only damages my reputation—and reputation among real estate agents in the area is absolutely essential to a surviving and thriving real estate business.”

I was selling my home in the middle of the summer of 2014. Two weeks after listing the home on the market, our air conditioning unit died. It turned out to be a \$2,500 repair. Little did I know, Pryce had already registered my home with a seller’s home warranty. The repair cost me \$50 to register and \$100 for a service fee, saving me \$2,350. Pryce explains, “I do this automatically with any sellers I’m working with because no matter how new or old a home is, things can unexpectedly go wrong. People who have a 30-year-old home

want to blaviate about how their home is like new and worth at least \$20,000 more than it actually is. It isn’t. It’s 30 years old, and worth \$20,000 less than you think it is—and no one’s 30-year-old home is like new—something will break before it’s sold.”

One of the most annoying tactics that Pryce encounters is when buyers carry on about their ability to buy a home. “When looking at a house, a potential buyer says, ‘Oh, this house is smaller than the one I’m in now. I could pay cash for this.’ And more often than not, it turns out he can’t, because a week later he’s telling me, ‘Well, interest rates are so low, I think I’ll get a mortgage.’ Just as it is with sellers, it is best to assume that, for whatever reason, buyers will somehow try to bullshit me.”

She also dislikes when other real estate agents bluster about their own credentials. “Reputation is everything in the real estate business. Any home valued at \$400,000 or less is going to have multiple offers. Now the home seller decides which buyer they will work with, but agents can inevitably influence this decision. Agents working for the home seller do not want to work with someone who is inexperienced because the more experienced agent will be expected to do ‘everything’—and nobody wants that. So, what you have is agents who are new to the area, don’t really know what they are talking about, and exaggerate their experience and success. I just had another agent tell me he was doing so well in real estate that he was on pace to clear \$20 million this year—and it was September. I thought to myself, ‘Well, you must expect to have a killer last quarter then, because I already looked you up on the multiple listing service that shows you only cleared \$5 million.’ It is much better to be transparent with people you are dealing with.”

She also demands that her clients be clear-eyed and realistic when it comes to the process. “My very first question is ‘How are you going to buy this home?’ Because the reality is many people are not ready to buy a home—they think they are, but they really are not—and I’m not interested in just taking you, or anyone else, on a grand tour of Lake Norman. Once the ability to buy a home is established, then we can start working together. And next, I want to know what my clients really want. Do they want a home for the next five to ten years? Are they looking to make a profit? What is this potential home buy really all about?”

Even if her clients have decided that they will buy a home, deciding which one can be overwhelming. To help, Pryce suggests her clients do something research scientists are all too familiar with. She asks

that they open an Excel spreadsheet. In the first column of the spreadsheet, they have to list the various features of a home they want to buy, including price, location, kitchen, bathrooms, size of master bedroom, flooring, ceilings, landscaping, neighborhood, school district, distance to work, even an X-factor they might not be able to fully describe. Let's say they have 25 features that are important to them. They then decide which of the features are most and least important to them and list the features in descending order of importance. They assign each feature a weight, ranging from .00 to 1.00, to represent how much influence each feature should have in their final decision—they put that in the second column—and make sure the sum of the weights is equal to 1.00. They then add a column for each home on their short list. They rate each home on each of the features they've already identified they want to include in the decision using a one-to-five scale. They then multiply each rating by the feature's respective weight. Finally, they sum each of the products. The home with the greatest weighted-sum score is declared the winner. Many judgment and decision-making experts refer to this method of decision-making as the weighted additive model, and it happens to be a very effective way of making decisions when multiple alternatives and features are available. It is comforting to know that some real estate agents are not relying solely on the bottom line to nudge their clients in one direction or another. Yet as a social psychologist on the lookout for bullshit, I'll continue to rely on the Excel spreadsheet.

Lessons Learned on Bullshit Detection

Over my years of research, I have asked hundreds of people I consider to be expert bullshit detectors to explain why so many people are duped by bullshit in their professions and industries. What failures in critical thinking and questioning do they see? Each and every expert bullshit detector has reported to me the very same things:

1. When people have good information they typically make good decisions. Better information doesn't always lead to better decision-making, but better decision-making almost always requires better information.
 2. Failed bullshit detection is usually about things people don't do and the questions they don't ask. The good news is that we can learn from their approach. Here are some common habits that will help you weed out bullshit and make smarter decisions.
- My ideal bullshit detector is Lieutenant Frank



Illustration by Pat Linse

JUST ONE MORE THING...

Columbo, played by Peter Falk in the 1970s television series *Columbo*. He was a homicide detective and famous for solving complicated “whodunit” murder mysteries by asking suspects “just one more thing.” This last question would always be the one that cracked the case. What does the Columbo critical thinking mindset look like in practice? We can list the basic habits of critical thinking as the following:

- Having a passionate drive for clarity, precision, accuracy, relevance, consistency, logic, completeness, and fairness.
- Having sensitivity to the ways in which critical thinking can be skewed by wishful thinking.
- Being intellectually honest, acknowledging what they don't know and recognizing their limitations.
- Not pretending to know more than they do and ignoring their limitations.
- Listening to opposing points of view with an open mind and welcoming criticisms of their beliefs and assumptions.
- Basing beliefs on facts and evidence rather than on personal preference or self-interest.
- Being aware of the biases and preconceptions that shape the way the world is perceived.
- Thinking independently and not fearing disagreement with a group.
- Getting to the heart of an issue or problem without being distracted by details.
- Having the intellectual courage to face and assess ideas fairly even when they challenge basic beliefs.
- Loving truth and being curious about a wide range of issues.
- Persevering when encountering intellectual ob-

stacles or difficulties.

Philosopher Peter Facione and the American Philosophical Association identified five critical thinking skills in the landmark 1990 Delphi Report: interpretation, analysis, evaluation, inference, and self-regulation. Each of these skills is essentially a different way of asking questions.

You are best able to detect bullshit when you are able to accurately interpret the claim. If you can answer the following questions, you can better understand the meaning and significance of a claim:

- What does the claim mean? How is it meant to be understood?
- Is there anything unclear, ambiguous, or not understood about the claim?
- How can the claim be best characterized and classified?

An expert bullshit detector analyzes the arguments that could be made in support of and against a claim. Engaging in analysis involves asking these questions of the claim:

- On what basis is the claim being made?
- How does the individual know the claim is true?
- What assumptions must be made to accept the claim and its conclusions as true?

When critical thinkers assess the logical strength of a claim, they engage in evaluation. They determine if the arguments and evidence for the claim justify the conclusions. Evaluative questions include:

- How compelling is the evidence supporting the claim?
- How well does the claim follow from a reasonable interpretation of the evidence?
- Do the results of relevant investigations speak to the truth of the claim?

Expert bullshit detectors engage in inference, which occurs when the relevant information needed to draw reasonable conclusions is secured and connected to the implications of the claim's truth. Inference is promoted when you can gain answers to questions like:

- What does the evidence imply?
- If the claim is true, what are the implications moving forward?
- If major assumptions supporting the claim are abandoned, how does the claim's truth stand?

Self-regulation involves assessing one's own motivations and biases and asking whether these influ-

ence one's interpretations, analyses, inferences, and evaluations of a claim. Self-regulation works best when engaging in metacognitive thought (thinking about one's thoughts) by answering questions such as:

- How good was my method in evaluating the claim?
- Are my conclusions based on evidence and data, or are they based on anecdotal evidence or what I read in the news?
- Is there anything I might be missing (or wanting to miss), and are my conclusions about the claim motivated by something other than the truth in any way?

Standards of Comparison, Reference Points, and Benchmarks

Expert bullshit detectors tend to see things differently than the rest of us and know things we don't. Specifically, expert bullshit detectors recognize the usefulness of different standards of comparison, reference points, and benchmarks from the ones that everyone else uses. For instance, if you are asked to think about the concept of political leaders in general and then asked how to rate Bill Clinton, George W. Bush, and Barack Obama, you might rate them negatively. However, if you are asked to think about specific political leaders, like Adolf Hitler, Benito Mussolini, and Saddam Hussein and then rate Clinton, Bush, and Obama, you might rate them more positively. All judgments depend on standards of comparison and reference points.

Before purchasing a car, rather than focusing on specs and financing, Baker focuses on what will increase the likelihood he can sell it for a profit. When dealing with clients buying homes, rather than having her clients objectively assess their subjective preferences, Pryce encourages them to create weighted additive models. Experts do not focus on what everyone else is looking at. They tend to employ effortful, critical thinking within their areas of expertise, something that does not come naturally. Here's an example from the annals of skepticism.

Since 2007, the annual number of terrorist incidents worldwide has averaged over 10,000, and injuries and deaths resulting from terrorist incidents have averaged more than 15,000 and 20,000, respectively. Most terrorist attacks have occurred outside the United States in places such as Syria, Iraq, Nigeria, Afghanistan, Pakistan, India, China, and Russia. The unsettling reality is that terrorist attacks can and do occur anywhere in the world. As a result, multiple efforts have been made to better detect this threat.

One such effort was Advanced Detection Equipment (ADE) 651. The ADE 651 was a handheld device designed to detect explosives by the British company Advanced Tactical Security and Communications (ATSC). It had a plastic handgrip with a swiveling antenna mounted on a hinge and it required no battery, as it was powered by static electricity. All that was required was for an operator to walk a few paces to “charge” the device, holding it at a right angle to their body. The antenna swiveled in the user’s hand and “tuned into the frequency” by pointing in the direction of an explosive.

The ADE appeared to be groundbreaking technology and an answer to detecting hidden terrorist explosives. With so much excitement about its potential, Iraq, Afghanistan, and 20 other countries in the Middle East and Asia entered into contracts to supply security forces with the detectors for a price of up to \$60,000 each. ATSC profited £50 million from sales of more than 7,000 units, and the Iraqi government alone is believed to have spent £52 million on the devices. The ADE 651 was quickly adopted as a bomb sniffing device because it offered a fast solution to a difficult problem.

There was only one problem with the ADE 651—it didn’t do what ATSC’s founder, Jim McCormick, claimed it could do. In fact, the ADE 651 was a piece of junk produced in the 1990s by American car dealer, commercial diver, and treasure hunter Wade Quattlebaum, who originally promoted the device as the Quadro Tracker to find lost golf balls. With mountains of golf balls produced as “proof,” he reasoned that his device could also be marketed as a detector of other important things, like hidden stashes of marijuana, explosives, and weapons.

The Quadro Tracker allegedly worked by dowsing. But McCormick and the Iraqi military leaders who purchased the ADE 651 didn’t care enough about the readily available facts on dowsing. Apparently, no one put the ADE 651 through a simple diagnostic test that would have surely revealed its lousy performance. Major General Jihad al-Jabiri, head of Iraq’s bomb squad, said, “Whether it’s magic or scientific, what I care about is it detects bombs.” If only Jabiri had cared more about the evidence he could have saved his country millions of pounds. McCormick and Iraqi military leaders successfully promoted the belief that the tracker could find explosives.

One group that was concerned about the truth behind the ADE 651 was the FBI. In fact, in 1996, the FBI had already permanently barred dowsing devices from being manufactured or sold as bomb detectors, declaring them to be fakes. The FBI had

already tested several devices like the ADE 651, and none had ever performed better than random chance. But the evidence wasn’t enough. By 2009, nearly every police checkpoint and many Iraqi military checkpoints had their own ADE 651.

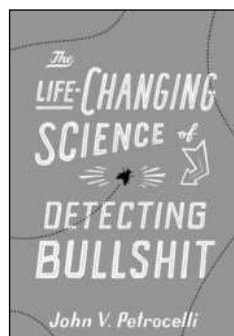
Because of the military’s reliance on the ADE 651, suicide bombers managed to smuggle two tons of explosives into downtown Baghdad on October 25, 2009, and killed 155 people and destroyed three ministries. Video surveillance proved that the bombers would have had to pass at least one ADE checkpoint. Unfortunately, the lives lost that day were among hundreds of lives lost that could have been prevented had it not been for the investments in bullshit.

When the dust settled, McCormick was convicted of three counts of fraud, sentenced to ten years of imprisonment, and ordered to forfeit cash and assets worth nearly £8 million. But the cost of McCormick’s bullshit was much greater. People lost their lives because his bomb detection devices didn’t work.

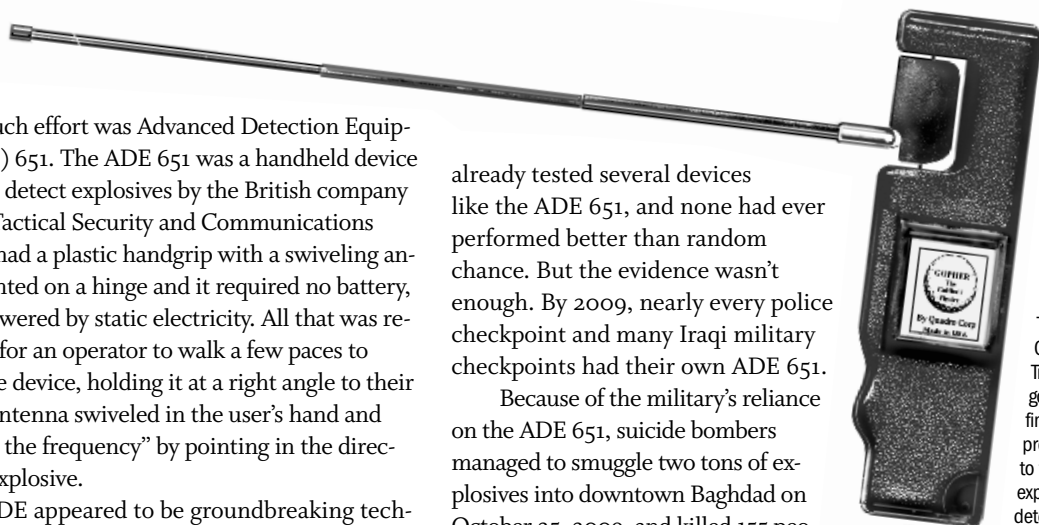
Life Without Bullshit

The science of detecting bullshit may not change society—but it can have a life-changing impact on you personally. By adopting a critical posture and the power of inquisitive questioning, you awaken the natural scientist and critical thinker inside yourself.

If enough people join the collective stand against bullshit, our world will become a very different place. We won’t have to listen to people talk about things they know nothing about. We won’t be exposed to baseless arguments. We won’t have to rely on incompetent people trying to do important jobs. Rather, we will collectively replace bullshit with evidence-based communication and reasoning, making more rational decisions based on facts, evidence, and reality. **S**



Excerpt from *The Life-Changing Science of Detecting Bullshit* by John V. Petrocelli. St. Martin’s Press. 2021. Copyright John V. Petrocelli and St. Martin’s Press.



The Quadro Tracker golf ball finder, the predecessor to the ADE explosives detector.

How Science Works (and Why Pseudoscience Fails)

BY STEVE SOBEL

INDIVIDUALS CANNOT MAKE VALID DECISIONS WITHOUT the ability to distinguish reality from fantasy, and a society cannot thrive without the foundation of an underlying shared reality. We are constantly bombarded by information, innovative concepts, pseudoscience, conspiracy theories, expert opinions, and other ideas which we must evaluate as truth or fiction or something in between. Frequently it seems that some people are viewing the world through distorting lenses that result in a perspective that is incompatible with the reality we believe we know. We wonder what planet they are living on that would foster views so at odds with our own experience. How do we separate the wheat from the chaff among all these ideas in a world operating at warp speed? Do we simply accept the word of authority? If so, which authority? Do we blindly rely on a limited circle of those we trust to filter out the falsehoods? If it rings true or pulls at our heartstrings, should we instinctively give credence to it? Should we believe only what science has proven and, if so, what constitutes proof?

We are likely hardwired to connect dots and find patterns among disparate pieces of data, but we are not hardwired to challenge our swift or hasty conclusions. To the contrary, we are easily misled. The appeal of supernatural, miraculous, and heartwarming stories is hard to resist. The astronomer Carl Sagan, recognizing the allure of belief in an afterlife as he grieved the loss of his parents, was spurred to create a “baloney detection kit.” Pseudoscience stands always ready to confirm our fantasies. Yet false beliefs based on rejection of rational and scientific reasoning can place our well-being and freedom in jeopardy. As Sagan wrote in *The Demon-Haunted World*:¹

I worry that, especially as the Millennium edges nearer, pseudoscience and superstition will seem year by year more tempting, the siren song of unreason more sonorous and attractive. Where have we heard it

before? Whenever our ethnic or national prejudices are aroused, in times of scarcity, during challenges to national self-esteem or nerve, when we agonize about our diminished cosmic place and purpose, or when fanaticism is bubbling up around us—then, habits of thought familiar from ages past reach for the controls.

But how do we distinguish falsehoods from truth? If we dive too deeply into epistemological debates about truth and knowledge, we might emerge as nihilists who reject the very possibility of establishing anything as truth. If we lapse into solipsism, we reject the idea of knowledge of anything outside our own minds. In between lies the realm of science and its goal of determining what we will accept as likely true and what we will reject as probably false.

Literary fiction can pack emotional truths and revelations of genuine impact into narratives. Thoughtful, coherent opinions may bestow enlightening insights. We learn much from personal experience, but optical illusions teach us that we cannot always believe what we see. Our own experience and sensory perceptions can sometimes deceive us.

Rigorous assessment of evidence and empirical investigation employing scientific methods conducted by communities of scientists working toward a consensus based on agreed-upon epistemic standards of evidence offers our best hope of establishing the truth. Of course, many of our beliefs cannot be proven or disproven and are not subject to scientific research, such as political, religious, and ideological viewpoints. Science does not normally address matters of political opinion, faith commitment, or moral truth, such as determining whether God exists, whether lying can be justified, whether democracy is the best form of government, whether abortion is always wrong, or whether individual freedom should be prioritized over social cohesion. Such questions are a matter of faith, dogma, or personal conviction, and thus it is appropriate



ate to recognize that the veracity of such beliefs cannot be proven or disproven per se, and we therefore should be wary of imposing our value judgments on others.

Science, however, is uniquely qualified to tackle many questions which can be of supreme consequence, such as determining whether our continued existence on this planet is at risk due to human-caused global climate change. Policy recommendations on what to do to mitigate such threats, while grounded in scientific facts, are ultimately political.

Faith provides comfort and certitude while science proffers doubt and questioning. If a belief persists unchanged over time and is impervious to challenge, then it is rooted in faith. Scientific conclusions can be proven or disproven and modified over time as new information is obtained. Continually evolving beliefs may feel less satisfying, but if we accept this discomfort, it enables us to edge ever closer to many truths. Science commences with a belief in nature and rejection of the supernatural. The healthy skepticism of science may never provide the solace of absolute knowledge, but it allows us to understand our world and acknowledge reality rather than escape to a potentially dangerous fantasy world.

The philosopher of science Karl Popper focused on the central role of “falsifiability” in science.² It must be possible, in principle, to disprove a statement in order to meet the basic criteria of a scientific theory. If it cannot potentially be subject to challenge and could never be disproven, even if untrue, then it is not a science-based conclusion. A scientific belief can be questioned and examined by anyone using scientific methods. Predictions based on a hypothesis are tested by experimentation. Observed results can refute the hypothesis or help to confirm or refine it. Ironically, the system that is most skeptical of its truths allows us to approach the most accurate understanding of reality. Science eschews definitive pronouncements if they have not been

adequately contested. Doubt can be a wonderful thing.

The scientific method involves careful observation, measurement, and experimentation. Like scientific theories themselves, the methodologies of science continue to evolve.³ Rather than stumbling about in the dark, we can use such methods to shed light on the world around us. To prove that a specific factor is the cause of a certain outcome, the scientist must control other factors that could contribute to that outcome along with, or instead of, the proposed factor. Research on a new medication, for example, relies on placebo-controlled, double blind studies—the so-called gold standard of the Randomized Controlled Trial—in which neither the patient nor the researcher doing the objective measurements on the patient knows if he/she has received the research medication or a biologically inert placebo. Patients must be randomly assigned to each treatment. The study should seek to control for all known confounding variables. Stories or anecdotes may be emotionally compelling, but do not constitute valid and reliable evidence. Science requires numerous replications of results under controlled circumstances rather than a single non-replicated study, much less a collection of heartwarming stories. Testing of theories by experimentation is more likely to reveal earthly realities than is purported divine revelation, inductive reasoning alone, or mere opinion.

Scientific study requires adequate numbers to allow for analysis of data. Appropriate statistical methodology must be employed. A perfect study does not exist, and methodological considerations are complex. This renders the role of replication all the more crucial, and the recent awareness of a “replication crisis” in science has made this all too apparent to a skeptical public. If a sizable portion of studies in the social sciences and medicine cannot be replicated, then why should the public trust science? Scientific conclusions are not always correct, but due to the requisite potential for falsifiability, this will be determined by use of

proper methodology and failure to replicate erroneous conclusions that prove the hypothesis to be false. It takes time to ascertain scientific truth and gain a more complete view of reality and gradually accumulate data. Single studies by themselves tell us little beyond the need for further research in that area. For example, understanding of the health risks posed by DDT emerged only over time. The hazards related to cigarette smoking required years of observations and study, especially as there were financial incentives to block scientific progress.

Over time, a scientific community reaches consensus about what is probably true or likely false. This consensus is reached after rigorous challenges to the proposed theory or hypothesis. There will always be outliers who maintain their skepticism, but they eventually fall to the wayside as the consensus grows. The consensus reached by climate scientists about the role of human activity in global warming did not happen overnight, nor was it a political cabal of left-wing scientists hell-bent on imposing restrictions on capitalism. It was hard fought over decades of debates over data accumulated through numerous independent lines of inquiry, most unrelated to one another. Scientists who study clouds, oceans, CO₂ levels, glaciers, ecological systems, sea levels, and the like not only do not meet on the weekends to plot the demise of the American way of life, they likely don't even know each other, do not attend the same conferences, and publish in different journals. We can be confident of the climate consensus because of this process, developed as it has over the centuries. Science is a social process.

Pseudoscience often attempts to mimic actual science. Facilitated communication, for example, is a scientifically discredited technique⁴ that purports to allow nonverbal autistic individuals to communicate by typing through the assistance of a facilitator who holds or maintains contact with the individual's hand or arm thus providing cues. Straightforward, controlled scientific studies in which, for example, the autistic individual and the facilitator are shown different pictures, consistently demonstrate that the real "author" of such messages is the facilitator through the subconscious ideomotor (or Ouija board) effect. Zealots reject such scientific research and, in its stead, present convoluted, alternative "proofs" as well as stirring stories to support their beliefs. Such anecdotes or reliance on bizarre, complex methods rather than straightforward, rational ones are red flags indicating pseudoscience is at work. Eventually a consensus was reached among both experimental and clinical psychologists that FC was not real. Similarly, the anti-vaccine movement offers unreliable, anecdotal evidence,

as well as speculative scientific-sounding statements without supporting evidence, while positing various conspiracy theories to delegitimize scientific research findings.⁵ Physicist Richard Feynman termed the phrase "cargo cult science" to distinguish pseudoscience/junk science from authentic science. He noted that it may display a superficial resemblance to science but lacks the "kind of utter honesty" consistent with rigorous investigation.⁶ Pseudoscience also often appeals to our emotions rather than our reason.

Purveyors of false information and pseudoscience often recruit celebrities to promote their claims. Sometimes accomplished scientists may even serve as the spokesperson. It is critical, under that circumstance, to keep in mind that an expert in Subject A is not necessarily an expert in Subject B. Likewise, we may trust those in our social circle and authorities within our own microcosm, but they are not necessarily qualified to endorse or reject a theory unless they have acquired specific expertise on the topic.

Conspiracy theories share with pseudoscience a disregard for objective evidence and rational thinking. Such theories may sound like coherent arguments, but just like psychotic delusions, they may depend on a false underlying premise. At other times they may be based on an infinitesimal kernel of truth, which is then exaggerated to greater proportions through speculation. And almost always they are impervious to falsification. No amount of contradictory evidence to the conspiracist's theory can overturn a committed conviction. Of course, real conspiracies do occur, such as Watergate, Iran-Contra, or the assassination of Abraham Lincoln. But they come to light when they eventually yield to investigation. More and more evidence can be systematically unearthed to reveal an actual conspiracy, and the source of such objective evidence is not limited to a circle of ardent believers.

Not all conspiracy theories and other apparently irrational beliefs are subject to investigation through the scientific method directly. Nevertheless, encouragement of scientific thinking can serve as a bulwark against the kind of misguided reasoning that nourishes such notions. On the other hand, erosion of confidence in science leads, in turn, to a more generalized rejection of systematic reasoning. When we jettison any requirement for objective proof for such theories or condone blatant lies, we ultimately enable a world of falsehoods and illusions, which threatens to unravel the very fabric of a democratic society. If our fellow citizens, leaders, and institutions no longer recognize the value of reason and science, then the loss of a shared reality will ultimately destroy mutual trust. When we discard science, we also cast aside reason.

Science and reason are core building blocks of this mutual trust so essential for a healthy and functional society—one in which truth can be separated from untruth.

In gathering our facts and data, deciding whether or not a source of information is reliable can be a tricky matter. Merely being published is not sufficient proof of accuracy. Not all scientific journals are equal. Some rely on peer review of studies, whereas others may forgo this requirement. Criteria for acceptance of submitted research varies significantly, requiring the serious reader to consider the methodology in order to judge the reliability of the study, or, at a minimum, to assess the general quality of the journal. Similarly, news sources utilize different criteria when deciding what to publish. Facebook may welcome “news” that attracts attention without regard to its veracity, whereas *The New York Times* must insist on verification, use multiple sources, strive for balance, employ fact-checking, and adhere to other standards of quality journalism before publishing a report.

We must guard against our own universal susceptibilities to cognitive errors of reasoning. For instance, we often confuse mere associations of two factors with proof of causation. There is an association between eating ice cream and drowning. This association is not causal in nature. Rather, both are related to a third factor—summertime. Daniel Kahneman, winner of a Nobel prize for his work on behavioral economics, reviews many such cognitive errors in *Thinking, Fast and Slow*.⁷ Once we make a decision or accept a belief, we tend to cherry pick the facts by seeking out confirmatory evidence while too readily dismissing contradictory evidence. As Carol Tavis and Elliot Aronson point out in *Mistakes Were Made (but Not by Me)*, cognitive dissonance pushes us to focus on support for that belief, as acknowledging we are wrong risks undermining our self-esteem.⁸

Carl Sagan’s Baloney Detection Kit advises us to ask if there has been independent confirmation of reported facts. Has substantive debate of the evidence by knowledgeable proponents of all points of view been encouraged? We must keep in mind that arguments based solely on authority carry little weight. All the different hypotheses to explain the facts should be considered and the remaining hypothesis should be that which survived all the efforts to negate it. Sagan advised against becoming overly attached to one’s own hypothesis. Be wary of theories whose supporters find it necessary to resort to *ad hominem* attacks against challengers. Launching such personal attacks rather than offering rational alternative interpretations of the data should be a red flag. In honor of Sagan, Michael

Shermer offered related recommended questions to distinguish science from pseudoscience as “baloney detection.”⁹ Shermer advised us to ask: Do the data and interpretations show signs of intentional distortion? Have the findings been verified by another source or only by those within the belief circle? Has anyone gone out of their way to try to disprove the conclusions? Does the claimant employ accepted rules of reason and research? Do the claimant’s personal beliefs and biases drive the conclusions?

As we are routinely flooded with pseudoscientific ideas, conspiracy theories, expert opinions, political rants, along with reliable data, validated theories, and robust science, we have an obligation to question all we are told. If it sounds miraculous, overly simplistic, blatantly tendentious, or too good to be true, it should set off our baloney detectors. We may crave certainty and simple solutions but cannot obtain them by sacrificing truth at the altar. We must apply basic tools of scientific reasoning, whenever applicable, to assess whether a proposed explanation is one that seeks to manipulate or fool us, or if it brings us closer to understanding reality. Willingness to entertain doubt and question proposed theories constitute the best defense against being duped. Ignoring reality may feel comforting while actually imperiling us and our world, just as an opioid haze may lull us into a sleep from which we cannot awaken. Embracing science, the scientific method, and systematic analysis of evidence can assist us in knowing the truth about the world we live in so that we can face its challenges with eyes wide open. **S**

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Pandemic Politics

How 2020 Impacted Americans' Social and Political Attitudes

BY ANONDAH SAIDE, KEVIN MCCAFFREE, AND MARSHALL MCCREADY

IN MID-2020, THE SKEPTICS SOCIETY LAUNCHED THE Skeptic Research Center¹ (SRC)—a collaboration between the Skeptics Society and qualified researchers. The SRC was created to better understand what misconceptions most divide our society, and to empower the public with the knowledge necessary to think critically about current events. In the December 2020 issue of *SKEPTIC*, we reviewed the reports released from our first collaboration. In this article, we will review the findings from our second collaboration.

The Skeptic Research Center collaborated again with the Worldview Foundations Research Team,² composed of sociologist Kevin McCaffree, psychologist Anondah Saide, and research assistant Marshall McCready. For this second collaboration, called the *Civil Unrest and Presidential Election Study* (CUPES), the team examined Americans' social and political attitudes in light of the substantial social and economic unrest of Summer 2020. CUPES investigated how events such as the presidential election, the George Floyd protests, and the COVID-19 pandemic impacted the attitudes of fourteen hundred Americans regarding a variety of topics.

Our findings were released across nine reports published by the SRC between November 2020 and March 2021. The reports, as well as detailed supplementary statistical information, are freely accessible on the Skeptic Research Center website. The titles of these reports reflect the study's key topics:

- Did Political Disunity Change in 2020? (#1)
- Intolerance Is Lower Than You Might Think (#2)
- Inequality and the Economy: Pandemic Tradeoffs (#3)
- Trust in Institutions (#4)
- Censorship Attitudes and Voting Preferences (#5)
- Outside of Politics, What Else Predicts Attitudes Towards Censorship? (#6)
- How Informed are Americans about Race and Policing? (#7)
- Why Are People Misinformed About Fatal Police Shootings? (#8)
- Has Time Spent with Family and Friends Declined? (#9)

Below, we will discuss six central themes we identified across our findings. We'll refrain from commenting about the potential implications of what we found because we elicited the interpretations of these findings from *SKEPTIC* readers such as yourself. These reader responses can be found at the end of this review.

Theme 1: Intra-Party Unity

In a study we conducted in 2019, we found greater political disunity among Democrats than Republicans.³ In response to the question, "If you had to choose, which political group do you think is most different to your own political views, currently?" Democrats were statistically as likely to select the Democratic Party as they were to pick the Republican Party. However, in our follow-up study, we found that this in-group bickering amongst Democrats had begun to reverse. Between 2019 and 2020, it seems that the Republican Party became less unified, while Democrats became more unified.⁴ For example, from 2019 to 2020 there was a 5 percent increase in Republicans choosing their own party as being opposed to their political views, along with a 11 percent drop in Republicans choosing Democrats (see Figure 1). In contrast, the percentage of Democrats who reported greater political disagreement with their own party dropped about 10 percentage points during the same period.

Theme 2: Gender and Politics

Men and women differed systematically across several dimensions in our 2020 study (CUPES). Gender was related to support for freedom of speech and freedom of thought such that women, regardless of partisan affiliation, expressed significantly lower support than did men.⁵ We also found gender to be related to changes in socializing during the COVID-19 pandemic. We asked how often respondents spent time with friends and family in 2019 and 2020. Compared to their male counterparts, women of both political parties reported significantly greater reductions in time spent with friends.⁶

Republican women and Democrats of both genders reported similar reductions in time spent with family. In fact, only Republican men reported no decrease in time spent with family from 2019 to 2020. Finally, we found that women reported significantly lower levels of trust in institutions than men.⁷ Republican women, in particular, reported the lowest overall trust in the news media, political officials, hospitals and doctors, and educational institutions (see Figure 2).

Theme 3: Complexity of Political Tolerance

In the study we conducted in 2019 on political attitudes, Republicans and Democrats were both generally tolerant towards members of the political party they most opposed.⁸ On average, people in both parties told us that they would not be irritated if a member of the oppositional party was their neighbor, co-worker, local elected official, or the romantic partner of a family member. Findings from the 2020 follow-up study seem to confirm that a general tendency towards political tolerance has survived the recent civil unrest and public health crises—Republicans and Democrats reported tolerant views towards political rivals and did not differ significantly from each other in their level of tolerance.⁹

Even though the average American expressed tolerance for members of the opposite political tribe, they did not express similar levels of tolerance towards supporters of both major 2020 presidential candidates. Members of both parties who reported that Joe Biden holds views contrary to their own tended to report *neutral or tolerant* attitudes towards Biden supporters. On the other hand, Republicans and Democrats who reported disagreement with Donald Trump's political views tended to express *somewhat intolerant* attitudes towards Trump supporters (see Figure 3).

Theme 4: Concern about the Pandemic

Overwhelmingly, both Democrats and Republicans prioritized reducing the spread of COVID-19 over other important issues, such as protesting racism and reducing unemployment. Almost 70% of Democrats and over 80% of Republicans reported they would prioritize reducing the spread of the Corona-virus over protesting against racism. While Democrats expressed greater concern about protesting racism and Republicans worried more about reducing unemployment (for example Figure 4 below depicts our findings regarding unemployment), most respondents agreed that the pandemic should be prioritized.

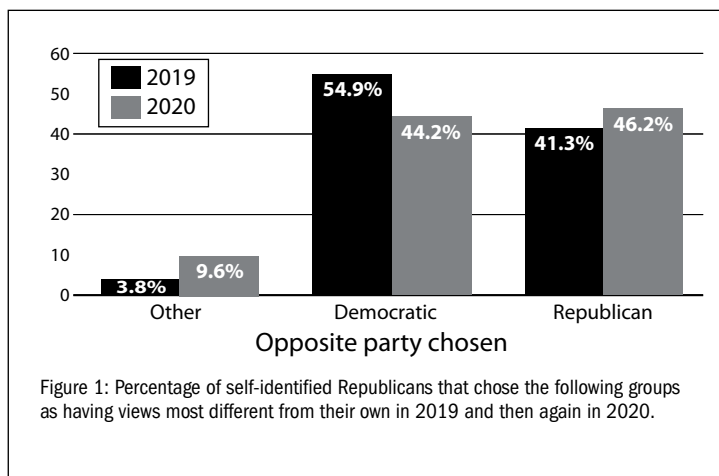


Figure 1: Percentage of self-identified Republicans that chose the following groups as having views most different from their own in 2019 and then again in 2020.

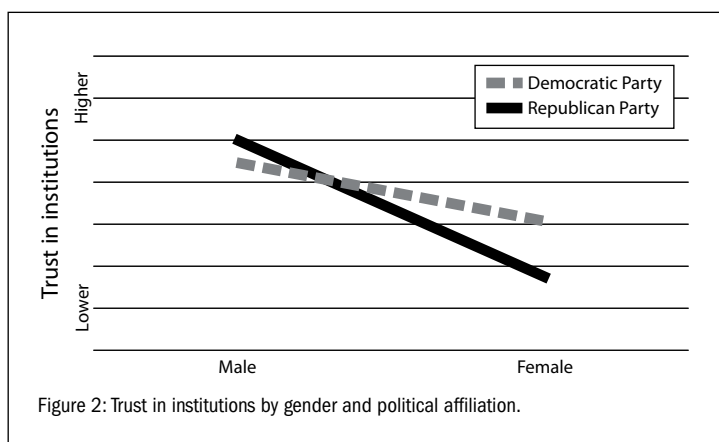


Figure 2: Trust in institutions by gender and political affiliation.

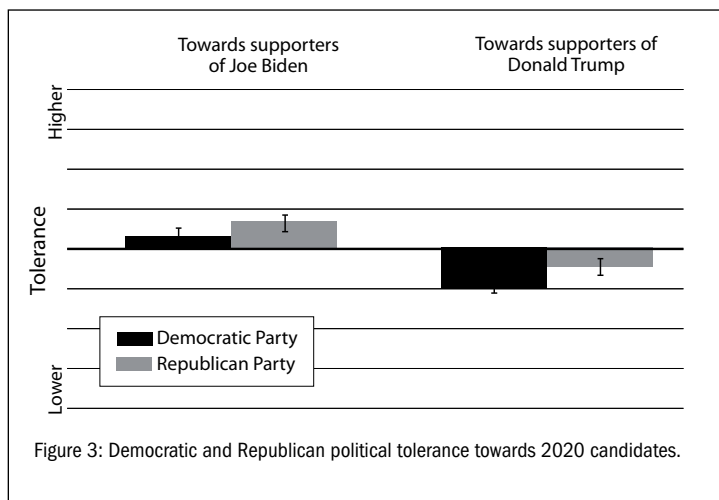
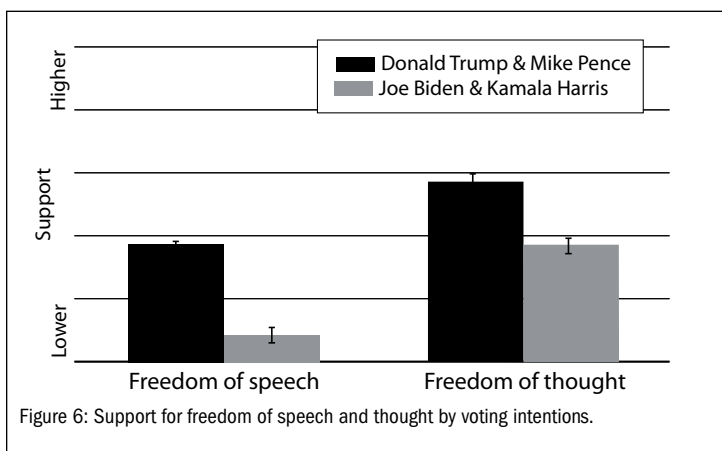
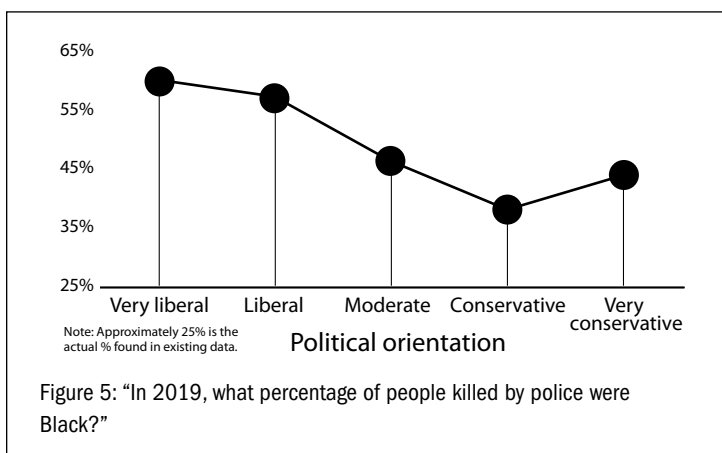
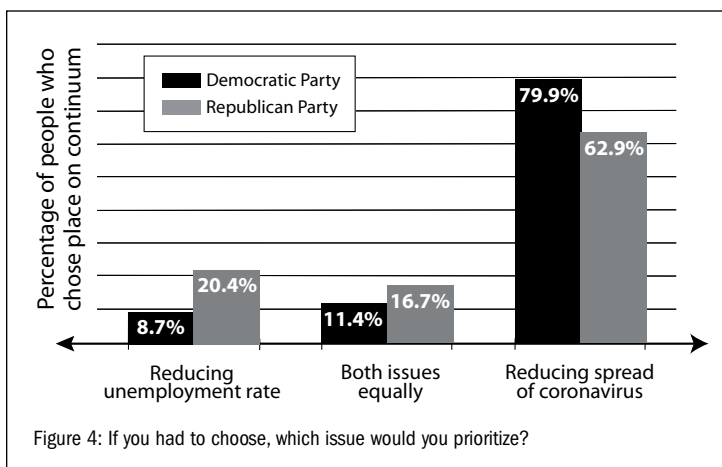


Figure 3: Democratic and Republican political tolerance towards 2020 candidates.

Theme 5: Race and Policing

An important set of results emerged when we attempted to assess peoples' knowledge about fatal police shootings and race. This topic was highly salient in 2020 due to the George Floyd and Black Lives Matter protests as well as formal efforts to defund the police. To examine how informed respondents were about



the facts, we asked them to guess: (1) how many unarmed Black men were killed by police in 2019 (option categories ranged from "about 10" to "more than 10,000"); and (2) what percentage of people killed by police in 2019 were Black. Available evidence suggests the correct answers to these questions range between 13-27 and 23.4-26.7%, respectively.¹⁰

Respondents across the political spectrum over-

estimated their answers to the second question.¹⁰ However, accuracy for answers to the first question differed significantly by political orientation. Political liberals tended to answer much less accurately than conservatives. Over half of those reporting "very liberal" political views estimated that 1,000 or more unarmed Black men were killed by police, a likely error of at least an order of magnitude. Interestingly, participants with "very conservative" views were relatively less likely than those with "conservative" views to provide accurate answers to either question. The "very conservative" respondents tended to overestimate their answers more than their "conservative" peers.

Another finding of note was the effect of media on peoples' perceptions of police violence. Our data revealed that the individuals most prone to estimation errors also reported high levels of trust in news media. Perhaps even more disconcerting, those in the sample with a graduate or professional degree reported the highest levels of trust in news media.

Theme 6: Censorship

To assess attitudes about censorship of speech and thought, we asked survey respondents to state how much they agreed with the following statements: "People should be allowed to say whatever they want, even if others think those words are harmful" and "People should be allowed to believe whatever they want, even if others think those beliefs are harmful." For the most part, both those intending to vote for Donald Trump and those intending to vote for Joe Biden in the 2020 election expressed support for these statements. Support for freedom of thought exceeded that for freedom of speech among both groups. Trump voters, however, were more vehement in their support for freedom of thought and speech compared to Biden voters (see Figure 6). The lowest levels of agreement for either statement came from Biden voters, who expressed significantly less support for freedom of speech than those intending to vote for Trump.

As might be expected, we found that the more people expressed support for freedom of behavior, the less interested they were in censoring speech or thought.⁶ However, another finding, much more difficult to account for, surprised us: self-reported levels of loneliness and happiness each *positively* correlated with support for freedom of speech. Why might both lonelier *and* happier people be more supportive of free speech?

Additional Details

We summarized some of our key findings above, but there is much more to CUPES than we can con-

vey here. We encourage you to review the nine reports on the SRC website for a complete list of our findings as well as a more detailed reporting of the results. There you can also find supplementary information about our methods of data analysis.

Implications and SKEPTIC Reader Commentary

What can we make of these findings? Over the last year, many of you have emailed research@skeptic.com to share your thoughts on the reports summarized above. We thought it would be interesting to share the perspectives of some SKEPTIC readers. We asked some of you to share your thoughts on the findings presented in this article and below are the perspectives shared with us by five people, in no particular order. We are always looking for new perspectives on this work, if you have thoughts about future reports, be sure to email us.

Commentary 1:

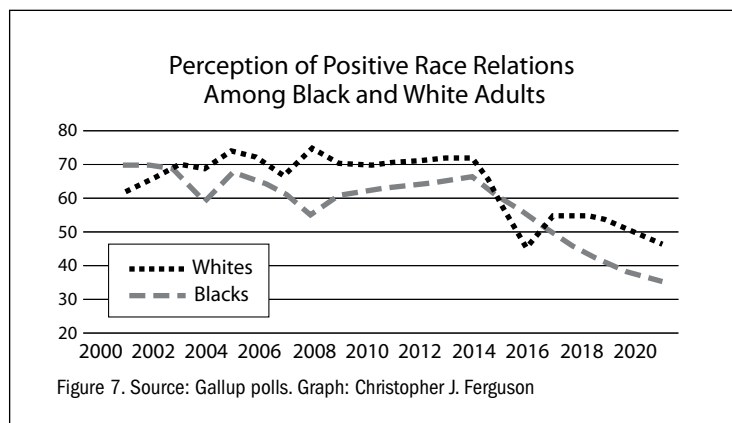
By Dr. Chris Ferguson, Professor of Psychology

Let me say at the outset that I believe our criminal justice system would benefit from many reforms, such as an end to the War on Drugs, more accountability for officer misconduct, the inclusion of mental health providers in some calls for service (but not “defunding” police which almost certainly will escalate violent crimes), and an end to “warrior training” programs for police which encourage them to be more aggressive.

The murder of George Floyd by a Minneapolis police officer began a massive societal debate about police killings of Black men, but the actual data on race and policing are complex and defy simple narratives. At present, the news media appear locked in a pattern of highlighting police shootings of unarmed Black individuals but failing to report shootings of unarmed individuals of other ethnicities. This can create an availability heuristic, wherein news consumers overestimate the frequency of shootings of Black individuals, and underestimate the frequency of shootings of White, Latino and Asian individuals.

The results of the analysis of the public’s understandings of police shootings demonstrates that the public has been misinformed of the frequency of such shootings. Worryingly, this misinformation is associated with political affiliation, with those on the political left particularly likely to overestimate the frequency of shootings of unarmed Black men, which in fact remain rare (as are shootings of men of other ethnicities). This is not to suggest innocence on the part of right-aligned media which may simultaneously gin up polarization and xenophobia among right-aligned consumers.

In a country of 330 million people, even rare events will happen often enough to create a steady



news media narrative. If the mainstream news media outlets (e.g., NYT, CNN, MSNBC, etc.) fail (as I believe they have) to properly inform the public of the complexities of the actual data (e.g., in some studies, social class indicators tend to predict shootings better than race), availability heuristics can create a mob mentality ruled by emotion that can push the public to support policies that will do far more harm such as defunding/abolishing police.

One last point: As Figure 7 above shows, we’ve seen a massive decline in race relations beginning in 2014. Before this, most Black and White people agreed that race relations were progressing positively. We need to understand why this changed. Undoubtedly, the reasons are complex, including increased focus on race and identity issues on both the left and right. But I believe the above study highlights a fundamental failure of the news media to properly inform the public.

Commentary 2: By Dave Porter, Former Professor of Behavioral Science and Leadership

To paraphrase Mark Twain, “It’s not the things we don’t know that cause problems; it’s the things we know that just aren’t so.”

Broadly, the CUPES Report results suggest things are not as bleak or polarized as many believe. This becomes more apparent as one focuses on the size of the reported differences rather than their statistical significance. Results suggested that 1 in 10-20 individuals have shifted their opinions over the previous year (CUPES-001). While statistically significant, this involves only a small subset of the population.

It was gratifying to see that we are still generally tolerant of those with whom we disagree (CUPES 002). However, the finding that intolerance is greatest against those we assume to be intolerant (i.e., supporters of the former president) is somewhat ironic. Extreme ideologies such as the much bandied-about trio of postmodernism, intersectionality, and Critical Race

Theory incorporate ideas such as Herbert Marcuse's¹¹ that those identified as privileged (often former oppressors) do not warrant tolerance or equal protection under the law. This is worrisome as well as being basically unconstitutional.

Another worrying set of findings related to public and news disinformation/misinformation. The misconception that the killing of unarmed African Americans by police is common (i.e., liberals estimate that tens or even hundreds of thousands of African Americans are killed each year) demands more radical changes than are appropriate when one realizes the actual number of such deaths is less than 30. Similarly, a local survey study¹² suggested that women's heightened concern about hostile work or learning environments was associated with decreased support for freedom of speech and academic freedom as found in CUPES 006. This is not to excuse any single wrongful death or hostile environment or to deny the disproportionate danger that young African American men face. However, authentic and enduring improvements in the human condition are likely to continue only with a commitment to start with the facts and acknowledge what is working as well as what needs fixing.

Commentary 3:

By Mark Newbrook, British Skeptical Linguist

It strikes me as strange that Democrats might be statistically as likely to select the Democratic Party as the political group most different from their own political views as they were to pick the Republican Party (or the equivalent for Republicans). I am not aware of any similar studies conducted in the UK or elsewhere, but I would certainly not expect such a pattern in the UK.

I suppose this pattern might arise if there had been a dramatic change of leadership (for instance, many "Old Left" Labour voters were unhappy with Tony Blair's more "ecumenical" style when he became Prime Minister in 1997). Is this a result of some feature of American politics that is obscure to me? Of course, in countries like the UK, political commitments are less polarized. There are a number of minority parties which attract considerable levels of support and indeed have some candidates elected to represent constituencies.

I wonder if women, regardless of partisan affiliation, expressed significantly lower support than men did for freedom of speech and thought, and less trust in institutions, because many women are persuaded that—given inherent biases in the prevailing system and in various institutions—support for "freedom" often amounts in practice to support for the (perhaps covert) programs of already privi-

leged groups (straight white males, etc.)

The issue of attitudes about police killings of African-Americans has been somewhat muddled by the relative lack of attention to the question of the higher frequency at which African-Americans come into contact with the police in the first place. Having said that, it is interesting, but perhaps not especially surprising, that political liberals (in the American sense of the word liberal) tended to overestimate, often seriously, the number of unarmed African-Americans killed by police. I suppose, as the "allies" of those killed, liberals have much more of an "axe to grind" in this respect. I find it much more surprising that many "very conservative" respondents also overestimated the number of African-Americans killed by police. I also find it surprising—and worrying—that respondents with a graduate or professional degree reported the highest levels of trust in news media (while also providing the least accurate estimates).

Finally, I wasn't surprised that Trump voters were more vehement in their support for freedom of thought and speech than Biden voters, although this is an unfortunate situation for most skeptics, who generally combine support for freedom of thought and speech with "liberal" (American sense) or "moderate libertarian" political stances.

Commentary 4:

By Ed Kreusser, Retired Medical Doctor

What was most astonishing to me in "The Trump Era" is not that someone like him maneuvered his way into the Oval Office but that, in spite of his many unmistakable inadequacies, so many Americans remain loyal to him. But then, "give the devil his due." Trump has been nothing short of brilliant in identifying and dangling irresistible enticements to attract his minions.

Regarding the study results, it seems so ironic and inconsistent that "Trump voters are more vehement in their support for freedom of thought and speech..." In my view, their rigid loyalty to Trump reflects an indictment of our public educational system. That they claim to value and support freedoms of speech and thought suggests that they have only a very superficial understanding of these terms, perhaps only as patriotic mantras without actually having learned to appreciate their full meaning and how to utilize them as existential civic tools.

Freedom to write and think one's thoughts is quite different and should be distinguished from deliberately lying to manipulate the opinions of others, especially now, using the awesome power of social media and the Internet. It has become all too obvious

that a huge percentage of people are exceptionally poor at critical thinking and evaluating evidence, rendering them susceptible to causing terrible social damage (e.g., the unshackling of racist sentiments or the insurrection of January 6th).

The notion of “freedom of speech” has become sacrosanct in our culture. So much so that it often eclipses any associated sense of accountability, or consequences or responsibility for truthfulness. When originally penned by James Madison in 1791, it was a very different world with less potent forces at play. The original framers could not have anticipated today’s environment and how this ideal can now be distorted and weaponized to have very negative and destructive effects. Accordingly, the unfettered concept of freedom of speech is now dangerously obsolete and should be recast with appropriate restrictions. As Søren Kierkegaard said: “*People demand freedom of speech as a compensation for the freedom of thought which they seldom use.*”

Commentary 5: By J. Doe, Police Officer

As a cop, “based on my training and experience” is a phrase I frequently use in my reports and when presenting probable cause for arrest and search warrants. Americans’ opinions of police shootings and policing in general are also based on their training and experience. Unfortunately, much of that experience is from cable news, TV dramas, movies, and the occasional traffic stop.

With regard to these findings on officer involved shootings, it’s no surprise that respondents’ political leanings affected their opinions. Our divided (and often fictional) news media landscape caters to, and reinforces, each team’s perspective on the issues at hand. Another significant factor is a lack of any general public understanding of policing. To demonstrate my point, see if you can answer these basic law enforcement-related questions:

- What is the difference between reasonable suspicion and probable cause?¹³
- Per your state’s general statutes, when is an officer justified to use deadly force?¹⁴
- Under what conditions should an officer read a person their Miranda rights?¹⁵

People’s overestimation of their personal expertise frequently shows up when police use-of-force is involved. I hear comments questioning the number of officers needed to restrain a suspect, why de-escalation wasn’t used with an active shooter, or even why an officer didn’t shoot a weapon out of someone’s hand. These kinds of comments suggest a view of reality utterly distorted by action movies

and lacking in any experience with violent people.

If I watched video from 10 heart surgeries in which the patient died, I’m not sure I could attribute any single death to malicious intent, error or negligence by the surgeon. Based on my training and experience in surgery, I think I could spot a doctor dropping a Junior Mint in a chest cavity. But beyond that, I would make no judgments; I have no real or perceived expertise in surgery.

Critics correctly point out that because police are entrusted with tremendous authority and responsibility, a shooting by an officer needs special attention. I agree, but this point is often made from the perspective that all officer-involved shootings were made in error, and it often ignores the function officers are responsible for in society. When a crime involving a gun occurs, the police are tasked with responding first. In many circumstances officers are expected to prevent future shootings by arresting violent offenders or through patrols in hot spots. We can’t separate America’s officer-involved shootings from American gun culture and gun crime. Overall crime rates are down, but gun and drug-related crime is concentrated in lower income areas. This is likely a factor in the divided opinions based on education level, since higher education generally indicates higher income/wealth. It’s easy to maintain a negative view of police when you don’t need their services. **S**

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9. CUPES-002
10. CUPES-007
11. Marcuse, H. 1965. “Repressive Tolerance.” In *A Critique of Pure Tolerance*, Wolff R.P., Moore, B., and Marcuse, H. (eds.) Boston, MA: Beacon Press.
12. Porter, D. 2020. “Identity, Belief, Perceptions, and Judgments of Hostile Environments and Academic Freedom on a Liberal Arts College Campus.” Kentucky Academy of Sciences, Annual Conference, 7 Nov. (Presentation available at <https://davesfsc.com>)
13. Reasonable suspicion that a crime has occurred, is occurring, or will soon occur allows an officer to temporarily detain an individual to investigate. This is a low bar of evidence. Probable cause is required to make an arrest and requires a higher bar of evidence—facts must suggest it is more probable than not that the suspect committed a violation of the law.
14. Every state’s use of force laws are different. Have you read yours? You may be surprised.
15. Custody (not free to leave) and questioning about the crime. Incriminating statements sans questioning, and questioning sans custody aren’t protected by Miranda.

IN
MEMORIAM

1947–2021

Pat Linse





Pat Linse in
1968 (age 21)

All Our Yesterdays

A Remembrance of Pat Linse

BY MICHAEL SHERMER

*Tomorrow, and tomorrow, and tomorrow,
Creeps in this petty pace from day to day,
To the last syllable of recorded time;
And all our yesterdays have lighted fools
The way to dusty death. Out, out, brief candle!*
—Shakespeare, Macbeth, Act 5, Scene 5

TOMORROW, AND TOMORROW, AND TOMORROW PAT Linse would be there at the Skeptics headquarters, an endless future with my business partner and friend of 30 years, until Saturday, July 24 when I learned of her passing to dusty death, her brief candle out. “What?” was my initial response, stuttered in utter disbelief. How can that be? She’d been there all our yesterdays and would be there all our tomorrows. Or so I thought.

Pat was the backbone of the Skeptics Society and SKEPTIC magazine. Because I was the public face of the organization—inasmuch as Pat was exceedingly shy, introverted, and disdained public recognition of her work (the quality of the work itself and its impact on people and society was her sole motivation)—many people either underestimated her contributions or were simply unaware of them. That is unfortunate, and one point of this tribute section of the magazine is to make clear how central a role her contribution was not only to the Skeptics Society and SKEPTIC magazine, but to the entire skeptical movement and its long and rich history. People know of the marquee names—Martin Gardner, James Randi, Stephen Jay Gould, Richard Dawkins, Steven Pinker, Neil deGrasse Tyson, Bill Nye, and the many other giants of skepticism over the past century—but there were many lesser known but no less important people who brought about this movement, and Pat Linse was first among equals on those pedestals. To punctuate the point of skepticism’s central role to a functioning rational society, here is how Stephen Jay Gould explained it in the Foreword to my first book, *Why People Believe Weird Things*:

Skepticism or debunking often receives the bad rap reserved for activities—like garbage disposal—that absolutely must be done for a safe and sane life, but

seem either unglamorous or unworthy of overt celebration. Yet the activity has a noble tradition, from the Greek coinage of “skeptic” (a word meaning “thoughtful”) to Carl Sagan’s last book, *The Demon-Haunted World*.

Skepticism’s bad rap arises from the impression that, however necessary the activity, it can only be regarded as a negative removal of false claims. Not so. Proper debunking is done in the interest of an alternative model of explanation, not as a nihilistic exercise. The alternate model is rationality itself, tied to moral decency—the most powerful joint instrument for good that our planet has ever known.

Rationality and moral decency. I cannot conceive of a more noble description of Pat Linse, whose role in that force for good was central and, while understated, was as important as anyone’s. Pat was so much more than the Art Director of SKEPTIC (her official title), as she also helped me select and edit articles, steered the movement of which we are a part in productive directions, and, personally, helped me develop my own ideas about science and skepticism. It has been my good fortune to meet a great many really smart people in my job—many Ph.D.s and Nobel laureates among them—and Pat was as smart, insightful, wise, and creative as anyone I’ve known. She was truly one of a kind.



I met Pat in the Fall of 1991, when she contacted me about a journal article of mine she read on a creationism case that went to the United States Supreme Court. I began that article (“Science Defended, Science Defined”) with a description of an *amicus curiae* brief on behalf of 72 Nobel laureates in support of the appellees in *Edwards v. Aguillard*, the case testing the constitutionality of Louisiana’s “Balanced Treatment for Creation-Science and Evolution-Science Act.” That brief was organized, in part, by the Southern California Skeptics, a local group that, along with many others, emerged after



Pat in the first office of the Skeptics Society—Michael Shermer's garage

the successful growth of CSICOP (Committee for the Scientific Investigation of Claims of the Paranormal—now CSI, Committee for Skeptical Inquiry). Pat had much more to tell me about how that brief came about, and especially the inner workings of the local skeptics group and why it collapsed the previous year because of the personal shenanigans of the organizer. We got together and three hours later I had a much deeper understanding of not only that creationism case, but of the skeptical movement. While I had attended some of the SCS meetings at Caltech (at the behest of the engineer Paul MacCready, whom I knew through racing human-powered vehicles), I was completely in the dark about the goings-on behind the scenes. Shortly after that meeting, Pat and I hatched the idea of relaunching the local group—only we thought we might as well make it a national and even international group and even start our own magazine.

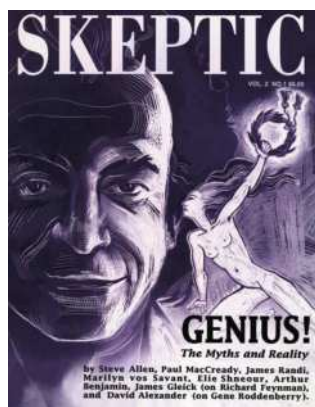
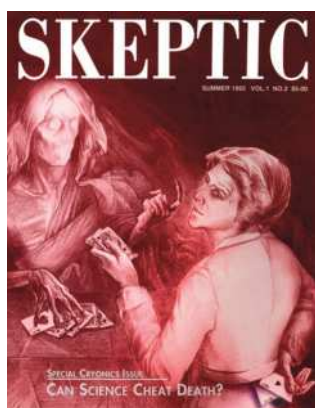
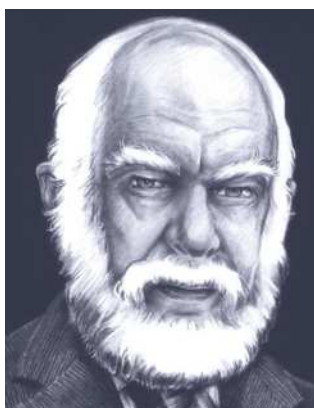
At that time I was teaching at Occidental College during the academic year, and in the summer directing the Race Across America, the 3,000-mile nonstop transcontinental bike race, for which I had created a magazine called *Ultra Cycling*. I had learned about the magazine business from my first job out of college at *Bicycle Dealer Showcase* (a trade publication), that motivated me to become a bike racer in my 20s. So when Pat and I started discussing producing a skeptic magazine of our own (*Skeptical Inquirer* was the publication of CSICOP

and we admired that magazine), I brought to the table some production knowledge, and Pat had vast experience working in Hollywood producing movie posters, promotional art, marketing materials, and more, working on anything from the animated Smurfs to the cigarette-smoking Joe Camel poster. I suggested the lame title of *The Rational Skeptic*, but Pat understood marketing better than I and came up with, simply, *SKEPTIC*. “The magazine, and the group and whatever has to be named the nickname,” she told an interviewer.

“You want the short quick memorable name.”

As you can see in the accompanying photo with Pat on the phone taking an order, we started *SKEPTIC* in my garage, and in addition to designing covers and writing lead articles, we answered phones, stuffed envelopes, picked up the mail, processed orders, staffed tables at our resurected Caltech science lecture series, and the like, until we had the funds to hire some staff, which took several years. I love how Pat described those early days in that interview:

When we first started out, we were packed into this little garage, with triple-shelved books and so forth. Big networks would come out to film us. They could not believe that we were in this tiny little garage, rather than some grand building. That's because of the façade we put out.



By this Pat meant our image, our profile, our reputation. Pat never cared about appearances; she cared about content. Who cares (or even needs to know) what our office is like? The only thing that matters is the work we put out. And for our first five years we published quarterly magazines and hosted monthly lectures out of that space. Still, working and living in the same environment is not sustainable, so in time we needed to expand the office. Fortuitously, a philanthropist friend and supporter of the organization purchased my home and donated it to the Skeptics Society, which by then was a 501(c)(3) nonprofit corporation. We converted the house into an office, and there we remain.

From there we expanded SKEPTIC by adding *Junior Skeptic* magazine (bound into the back of every issue), inspired by an episode of the animated television series *The Simpsons*, in which Homer has an alien abduction experience while his daughter Lisa explains to him, “Dad, according to *Junior Skeptic Magazine* the chances are 175 million to one of another form of life actually coming in contact with ours.” The skeptical researcher, writer, and artist Daniel Loxton took the reins of *Junior Skeptic* and has produced dozens of classical skeptical investigations. And as the world shifted to digital, we added Skeptic.com and eSkeptic, both artfully and brilliantly produced by William Bull. Together, Daniel and William will henceforth take up the mantle of Pat’s production. On that front, let me highlight a few of the initial SKEPTIC covers that I find especially emblematic of Pat’s deep insight into the subjects she was illustrating.

Our very first issue, Vol. 1, No. 1, was originally scheduled to feature a portrait of James “The Amazing” Randi (see illustration, top left), but just before publication Isaac Asimov died, and we felt we should pay tribute to one of the founding fathers of modern skepticism. Pat’s illustration of the great one is masterful.

Vol 1, No. 2 was our special issue on the scientific search for immortality: “Can Science Cheat Death?” Here the grim reaper is un-fooled by the pair of aces science is hiding. Nearly 30 years later I’m afraid the prospects for an affirmative response to the cover question remains grim, including and especially for cryonics, mind uploading, and other sci-fi scenarios. This one is especially poignant to me at this moment since Pat did not believe in an afterlife and now she’s gone. I’d like to believe she’s wrong, and that her essence continues on elsewhere in some quantum field or cyberspace cloud, but what I want to believe is true and what is actually true do not necessarily align.

I absolutely loved Pat’s cover for our issue on genius and creativity, Vol 2, No. 1, for which she selected the quintessential genius Richard Feynman to portrait, along with the muse iconography of how most people (wrongly) think of genius.

Sometimes Pat aimed to capture a complex phenomena through a minimalist cover, which I think is best captured in Vol. 12, No. 4 in our issue on 9/11 conspiracy theories, illustrated by Daniel Loxton. One of Pat’s greatest gifts as Art Director was her ability to spot and nurture talent, inspiring creativity and personal loyalty in artists all over the world with her generous and heartfelt encouragement and advice.

But in general Pat preferred more complex covers with many design features. One in this genre is her cover Vol 14, No. 3 on historical revisionism and the white washing of Hitler and the Nazis (separate from Holocaust denial, the topic of another issue). I think Pat’s cover perfectly captured that theme.

And I know a favorite of Pat’s in this vein was the cover of Vol. 17, No. 3 on whether or not the United States is a “Christian nation.” Here’s how she described that cover in an interview:

The background is a composite of about 20 different tree shots and George Washington is in a completely impossible

pose that is actually patterned after a 1930's *Saturday Evening Post* cover. You have a problem when you have a monumental figure and they're in a prayer posture because those are two contradictory things. You do a lot of cheating, fudging, and so forth to keep that monumental, grand figure look and still have them in an attitude of prayer. That's probably 20 different shots, photo-composed together. But since I can illustrate completely realistically, I don't have a problem putting stuff together. I used to paint right on photos for the film industry, so I have a pretty solid background there.



My favorite cover by Pat was that of Vol. 2, No. 2, which she called the “Gort Pietà” (after Michelangelo’s famous marble statue in St. Peter’s Basilica of Mary holding Jesus after the Crucifixion). The issue was on the relationship of science and religion, and we included an article on the theme of resurrection and immortality in science fiction. The author, Steve Smith, discussed Robert Wise’s 1951 film *The Day the Earth Stood Still*, a Christ allegory in which the alien Klaatu (Michael Rennie) comes to Earth with his killer robot Gort to warn Earthlings about the dangers of nuclear weapons and the arms race. Klaatu tries to meet with authorities but is rejected and (like Jesus) ends up mingling among the common people and takes up residence with

a single mother (and her son) named Helen Benson (Patricia Neal), who is Mary Magdalene to Klaatu's Jesus. (To reinforce the allegory Klaatu's Earthly name is Mr. Carpenter.) Out of fear and ignorance, government authorities kill Klaatu, so Gort is instructed by Benson (through one of the now classic lines in all science fiction, "Gort: Klaatu barada nikto") to rescue Klaatu out of the morgue and take him back to the ship to be resurrected.

Klaatu now brought back to life, the astonished Benson exclaims, in reference to the seemingly omnipotent Gort, “You mean, he has the power of life and death?” The original screenplay called for an affirmative answer to this ultimate “how-far-can-science-go?” question, but the Breen Censorship Board (a self-policing committee of the film industry in the 1950s) nixed the line, insisting that Americans might be offended by the implications. In its stead, Klaatu answers, with ecumenical sensitivity: “No, that power is reserved to the almighty spirit.” Klaatu then emerges from the ship to deliver his stern warning to the authorities:

The universe grows smaller every day and the threat of aggression from any group anywhere can no longer be tolerated. There must be security for all or no one is secure. Now, this does not mean giving up any freedom, except the freedom to act irresponsibly. I came here to give you these facts. It is no concern of ours how you run your own planet. But if you threaten to extend your violence, this Earth of yours will be reduced to a burned-out cinder. Your choice is simple. Join us and live in peace or pursue your present course and face obliteration.

Having delivered his message of threatened destruction and potential redemption, Klaatu's Jesus ascends to the heavens.





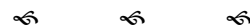
Photos by David Patton

As for what it was like working with Pat, it would be virtually impossible for any two people to work together every day for 30 years without conflict. Of course Pat and I had our differences—professionally, politically, and personally—but in the end we followed Thomas Jefferson’s sage advice, in which the great statesmen recalled, “I never considered a difference of opinion in politics, in religion, in philosophy, as a cause for withdrawing from a friend.” Whenever we had a fight about something professionally, *someone* always said “I’m sorry”... and Pat always said, “That’s okay.”

Politically, some of our contributors in this issue have commented that Pat’s liberal leaning ideas sometimes conflicted with my own more libertarian preferences—but in Abraham Lincoln’s “team of rivals” model, each side grows through debate and disputation. I would listen carefully to Pat’s reasoning over particular issues and, at some time in the future in the privacy of my thoughts, would course correct my political ship. At least that’s how I remember it in a *l’esprit de l’escalier* (the wit of the staircase) perspective.

Finally, personally, Pat treated my family as if they were her own. She had no children, so she treated my daughter Devin, and later my son Vincent, with love and respect and the nourishment any mother would give to her own issue. And not just my charges, but those of our other employees and especially the daughter of a friend, Shoshana

Cohen, who came of age, along with Devin, at so many Skeptics Society public events at which they worked. Pat’s loving and nurturing essence shone most brightly in those personal connections.



There is so much more I have to say about Pat, some of which is well captured by the other voices in this tribute, so allow me an emotional reflection on the absence of my friend and partner, and how the two of us thought about life and death. Namely, we focused on the former and largely ignored the latter, inasmuch as no one knows—or can know—what happens after we die. To ask that question is the equivalent of asking where you were before you were born...nowhere. If Pat lives on anywhere it is in the hearts and minds and memories of her family, friends, colleagues, and co-workers; in her creative art and writing; in her kindness to strangers and her empathy for those less fortunate; and, as we hope to convey in this tribute, in her legacy that will carry on indefinitely into the future. Her work will remain valuable long after my own time comes, and hopefully for many generations more. Inasmuch as skepticism—to close the loop on this reflection from where we began—is a core constituent of a rational and civil society, then we all owe a debt of gratitude to Pat Linse. **S**

The Soul of Science

Collected Tributes to Pat Linse

Ralph Lewis, psychiatrist and contributor to *Skeptic* magazine:

I was very fond of Pat from the first time I met her. She was a very likable person, in all her angsty, introverted shyness. She clearly preferred pulling the strings from behind the scenes. She once told me with a sly smile that she enjoyed arguing with Michael about political positions, with her seeing herself as more liberal and him (back then) as more libertarian. She joked that he would disagree vociferously with her and then she'd overhear him a short time later using her arguments in a conversation with a conservative—which gave her great satisfaction.

Despite her narrow geographical comfort zone, she was a most worldly person. In her preferred social mode of 1:1 interactions she was very personable, caring, helpful, lively, and good humored. And she was certainly a talented artist, a meticulous editor, a

sharp thinker, and an astute observer of the human species.

I'll miss her, in all her endearing quirkiness.



Carol Tavis, social psychologist, "Gadfly" columnist for *Skeptic* magazine:

When a death comes this suddenly, with no forewarning to friends and colleagues, we are left with all those unsaid words, all those unexpressed appreciations, that we wish we had had time to say—especially to someone as shy and reserved as Pat. Though we exchanged many a merry email over the years, I'll never know if she was aware of how much I appreciated her artistic talents. I'd get a proof back from some Gadfly column, and see that she had left a big space for the art; and I'd say, "What in the world will you do here for this impossibly compli-

cated or contentious topic?" And she would reply, "Oh, I have a little idea in mind..." and then, boffo, it would be perfect: an illustration that was never boringly on the nose, but rather an elbow, a wink, sometimes a kick.

Stanley Milgram had a term for the people in our lives whom we feel attached to, but don't really know—a fellow train commuter, that person down the hall in our office, a neighbor we greet every morning: "familiar strangers." We don't realize the importance of those connections until they are gone, and that is how I'm feeling now. Pat was a stranger to me in terms of her personal life, but familiar through so many years of SKEPTIC assignments, and I now feel bereft of that sweet, enjoyable, reliable connection. She gave so much to SKEPTIC and to skepticism, and to all fortunate enough to work with her.



Photo by David Patton



Photo by David Patton

Brian Dalton, writer, film producer, creator and star of *Mr. Deity*, designer of *Skeptical* magazine in our early years:

I've known Pat Linse since the early 1990s when I was just coming out of religion. Amazingly in retrospect, I found the Skeptics Society and SKEPTIC magazine through Dr. Laura Schlessinger (true story), the noted conservative radio talk show host who was an early board member of the Society when she publicly denounced the pseudoscientific notion of recovered memories (that turned out to be false memories). I met Pat for the first time when I attended one of the Skeptics Caltech lecture series events and purchased a bunch of back issues of the magazine. Her gentle spirit and kind manner stood out immediately. But as I got to know her over the years, I realized what a force she was. That's exactly how I came to think of her—a force of nature.

We got to know each other better when she asked me to redesign SKEPTIC in the late-1990s. I was doing graphic design then, and Pat felt it was time for a new look. Quite a bit of our time together then was spent helping her convert everything over in the layout program she was using (it was different from the layout program I was using).

It took her almost no time to get everything up and running, her intelligence and creativity on full display.

When I began writing and producing the *Mr. Deity* show, Pat and Michael were a great source of support. She pushed the *Mr. Deity* DVDs I brought to the monthly Skeptics Caltech events, and she was always enthusiastically helpful in spreading the Deity gospel. I would almost call her a disciple, but Pat was no one's disciple!

Our personal conversations over the years tended towards liberal politics, on which we mostly agreed. Aside from her kindness and intelligence, my most accessible memory of Pat revolves around my desire—I had it almost every time I saw her—to grab those glasses from her face and clean them! I never understood how she could see through those cloudy lenses!

Being a force of nature, the possibility of her absence never even occurred to me. I'm sad about this tremendous loss, but at the same time I feel incredibly fortunate to have known such a powerhouse of a human being. Most of all, I will remember that Pat never failed to make my life just a little better, somehow, in some way, every time we met.



Harriet Hall, M.D., “SkepDoc” columnist for *Skeptical* magazine, critical expert on pseudoscientific medical claims, and long-time colleague:

I was devastated to learn that Pat had died. She was the soul of SKEPTIC magazine. Her duties may be assumed by others, but she can't be replaced. She was a unique combination of artistic talent, skepticism, and hard-nosed critical thinking skills. And of course, she was the magazine's corporate memory. I wish I could have gotten to know her better. Ours was a long-distance relationship. Our only close encounters were brief contacts at conferences and one memorable occasion when I was in the area and she invited me to the office and gave me a tour.

She emailed me with galley proofs of my articles and promptly and accurately made any corrections I suggested. She did the illustrations for my SkepDoc columns, and it was always a delight to see what her creative mind had come up with. I thought the illustration for my column on Mark Twain and alternative medicine was pure genius (a steamboat on a river filled with floating bottles of quack medicines).

Pat was easy to talk to and was always very supportive. I came to trust her judgment (perhaps because she

always agreed with my opinions about individuals and about controversial issues!) She impressed me as well-organized, efficient, generous, friendly, self-effacing, and uber-competent in every sphere. I frequently emailed her with questions and comments about anything and everything. I came to think of her as a true friend and a kindred spirit. I will miss her terribly.



Kevin McCaffree, co-director (with Anondah Saide) of the Skeptic Research Center, sociologist of religion, secularism, criminology, and cultural evolution:

I met Pat for the first time in 2010. She was helping to sell admission tickets behind a folding table just inside the entrance to the Caltech auditorium at which the Skeptics Society hosted its Distinguished Science Lecture Series. I was there to hear one of the speakers and in time I came to enjoy the environment and show up early (with Anondah Saide) to help set up and sell tickets.

Anondah and I came to find Pat as interesting as any speaker in the series. She was conversant about many facets of science, she was precise in her thoughts, and she was utterly immune to bullshit. She was going to tell you the truth as she understood it, and aspects of that truth that were interesting to her, from the Cambrian explosion to the evolution of deception. She'd expect an informed and thoughtful answer! I'd not realized it at first, but in meeting Pat I was seeing the "soul" of science: naturalism, skepticism, curiosity. Let me explain.

I'm not sure where it was, maybe it was behind a book display at one of the speaker events or James Randi's The Amazing Meeting event in Las Vegas, but I distinctly remember her telling us about Michael's libertarianism and, more pointedly, his appreciation for Ayn Rand. This was fantastically unacceptable for Pat who, of course, was

precise in her diagnosis of the many ills and societal misfortunes that befall people quite independent of their wills or desires or drive. She understood that selfishness and self-actualization are not bad in themselves and can do incredible good—as in the case of successful business entrepreneurship—but this by itself isn't enough, at least yet, to adequately ensure that everyone born today will have a roughly equal shot at success. Pat insisted that this required some kind of government intervention; highly scientific, rational and realistic government intervention. I remember finding her persuasive about this. I also remember asking her if she had changed Michael's mind on things. "Oh yes," she said, "he is much better now."

On another occasion, there was some debate over email about what to do regarding a contributor's credentials. At the end of this person's article on a serious and important topic, they'd claimed to have Ph.D. in a scientific field though, in fact, they had no such degree. Pat found the professional misrepresentation unethical, of course, but she made a point to insist that it shouldn't matter on principle whether a person has a Ph.D. What mattered was whether they knew their stuff or not. Her point was deeper. This person shouldn't have felt the need to inflate their formal education and degrees—SKEPTIC would publish anyone capable of interesting, informative scientific commentary. My own experience as a professor confirms her intuition that a lot of credentialism is just fluff. Pat's vision, implicitly, was for a magazine that anyone could be a part of.

There are other exchanges, other little jewels here and there, that Pat gave me. She was shy, so sometimes it took a bit of effort to get her to begin sharing. But I'm glad I tried and I'm glad she shared with me.

There are many nuances and niches and nooks in nature and in life, and one needs a certain dexterous and stubborn curiosity in order to properly

peek at the world in its fullness. Pat helped me with this.



Donald Prothero, paleontologist, geologist, teacher, and director of various Skeptics Society Geo-Tours:

I've known Pat since the early 1990s when I became an active early member of the Skeptics Society and began to contribute articles to the magazine. But our longest interaction was through books and publishing. When I began to design and produce my own books for my publishers in QuarkXpress (the software that printers use), she taught me all the tricks and always knew how to troubleshoot any problem. She was not only a Master of Quark, but also a master of design and illustration. She did the cover of the first edition of my paleontology textbook in the grand movie poster tradition (she had done the art for many movie posters in her time). When my publisher needed someone to redo all the line art for the third edition of my paleontology textbook, she worked on every piece of art so that they all had consistent line weights and type styles. She also did the art for several other of my books. For many of my SKEPTIC articles, she took crude images I had provided her and rendered them as masterfully clear drawings.

My other long-term interaction with Pat was during the Skeptic Geo-Tours that my wife Teresa LeVelle and I ran from the early 2000s until 2016. I would write up an elaborate guidebook for each trip, and she would design it, illustrate it, and then get it bound and printed with a great cover. Then she would help with the trip logistics, from feedback on planning the trip, to pitching in at lunch to get all the folding tables and coolers out and the food laid out so we could feed an entire busload of people in a few minutes.

We spent a lot of time together when we set up the Skeptics booth at

The Amazing Meeting (TAM) and at our monthly lectures at Caltech. The running joke was that all the tables and boxes of books had the most educated moving crew in the business, with several Ph.D.s among us. But we got it moved upstairs to display, then broken down and put away in record time, with Pat supervising every step and making sure everything got done right.

Most of all, I will miss Pat as a close friend and sympathetic ear. Sometimes she would tell these amazing stories to me, just hanging out when the booth was not busy, or we would talk about all sorts of topics, skeptical, political, religious, and scientific, whenever the opportunity arose. She was a frequent dinner guest at our house. As others have noted, she was the quiet force behind the Skeptics Society and especially SKEPTIC magazine. Other people make take over parts of her job, but she can never truly be replaced.

I will miss her terribly.



Tim Callahan, author, and Religion Editor for SKEPTIC magazine:

I was shocked and stunned to hear of the sudden and unexpected death of Pat Linse. As a fellow artist, I admired her level of skill, craft, and competence.

However, what most impressed me about her was her quiet common sense—or perhaps I should say *uncommon* sense, since that quality is so lacking in so many people. She also had an easy-going, approachable nature. Whenever I dropped by the office of SKEPTIC for whatever purpose, I found it a calming delight to converse with her and I was, on a number of occasions impressed by her history of previous world travels. She was the complete opposite of anyone I’ve encountered who was vain and self-aggrandizing. I will miss her terribly.



James Gurney, artist, author, *Dinotopia* creator, and classmate of Pat Linse’s at ArtCenter College of Design, Pasadena:

Pat and I were classmates at art school. She was the only student who saw through the nonsense in most of the introductory classes. She invented the term “artificial grief” for the assignments that seemed designed to waste the student’s time with pointless effort. She would run every idea through her invisible “crap detector,” a mental mechanism that we had never heard of before.

In the basic color class, while the rest of us struggled and failed at painting smooth, bright color swatches, she ignored the pigments and the method that the teacher assigned, and she bought her own specialty colors, applying them with an airbrush instead of a regular brush, with spectacular results.

She put herself through art school by airbrushing the packaging art for the Smurfs. To us she had that exotic air of professionalism, and her view of things carried a lot of clout, sometimes more than the teachers.

I was not surprised to hear later that she was involved in launching SKEPTIC magazine, and I wish I had

been a little more skeptical myself back in those days.



Bill Nye (“The Science Guy”), science communicator:

You don’t have to be psychic to know that, right now, you’re reading SKEPTIC magazine. Note well though, this is the first one you’ve ever read that Pat Linse didn’t finish before it got to your in-box, be it ground-service or electronic. You can’t run an organization like this, without someone like Pat behind the scenes, writing, producing, editing, and laying it all out in readable fashion. Michael confessed to me how lost he feels without her. Turns out, she co-founded this outfit. Without Pat, your critical thinking skill would be that much more diminished. Her hard work was valuable; her wisdom was priceless.

Readers of this magazine are not much for the afterlife. If it turns out there is one, we’ll all be surprised—and so will Pat. From the background, she influenced all of us in the very best way. She left our world better than she found it. She will be missed indeed. **S**

Art and Skepticism

An Appreciation of Pat Linse

BY DANIEL LOXTON

MY FIRST EMAIL EXCHANGE WITH PAT LINSE TOOK place in 2001. We talked about farm animals.

I had sent an unsolicited art submission query email to my favorite magazine, not even knowing if the Art Director was a man or a woman. I'd

finished art school a year earlier, and was hoping to move away from the trade that funded my life during my 20s—herding large flocks of 1500 sheep in the wilderness on the Canadian side of the Alaska panhandle. I wasn't qualified to write for *SKEPTIC*, I said, but I'd be honored to volunteer for some illustration.

"Cold call" mailing to publishers and art directors can be a lonely, demoralizing affair for unknown young artists. Often you get nothing back. A good response is a form letter checklist with something ticked off, or perhaps a more generous handful of sentences on what you need to improve.

To my great surprise, Pat emailed back immediately. "You herd sheep?!?" she asked. "How many do you take care of?" She excitedly welcomed me to the "agricultural art club," naming several skeptics she knew with livestock backgrounds. "I myself won first prize at the international livestock exposition in Chicago judging dairy cattle some years ago," she said. (Not only can you win prizes for a gorgeously perfect cow—*judging* the perfection of cows is itself a competitive event.) She threw out several questions related to the sleeping habits of sheep and her personal skeptical specialty, the urban legend of cow-tipping.

"Oh yes, your artwork," she added as she wrapped up. "I like your style. Send me some stuff." And I did.

Twenty years later, I am mourning my friend, boss, and mentor. As I think about who she was, I'm recalling for some reason the postscript she appended to the second email she ever sent me: "P.S. I am a cowgirl, not a cowboy."

I think that may be the title of the story of her life.

Pat Linse grew up around cows—a 1950s All American 4H farm girl from a big rural Wisconsin family. This photo from her young life moves me so much. Just look at that kid: chin up, eyes bright and curious, full of big questions and the courage to seek answers. It's right there, clear as day: this country girl is going places.

Getting there wasn't easy, though. She was the first of her sisters to go to college—one of millions of pioneering young women in a changing world. "*Sputnik's* influence on the school system, the pill, the hippie era which made it OK to dress down...all of those

things made my escape easier," she recalled. "Yes I worked my friggin' tail off, but it wouldn't have worked without all of those things."

Throughout her career, Pat was keenly aware of an uncomfortable truth: talent and hard work are rarely enough for success in the arts. Most working artists get where they are through a combination of hustle, unreasonable sacrifice, practice—and blind luck. For many, the deciding factor is that someone in power chose to open a door for them that remained closed for the next hundred hopefuls in line. For others, the deciding factor is even simpler: do their parents have money?

Pat was already a hardened veteran of a decade in the thankless trenches of commercial art when she put herself through her Masters degree at Art-





Photo by Daniel Loxton

Center College of Design in Pasadena. She made friends, but generally found her classmates an entitled, privileged lot. Many were merely “upper class kids with no real job experience,” while others were “*real rich people*”—“sons of Saudi Sheiks” and the “wives of oil barons.” As she recalled, “ArtCenter students are not a rebellious lot. They have been told if they just make it through the school the world will be theirs on a platter.” Perhaps, for them, it would be. But Pat felt their “concept of how the world works is so astronomically out of line that they are practically unemployable until they’ve been knocked about by the real world a bit.”

Pat was “not a cowboy” in the sense that she was deliberate, humble, and soft-spoken by nature. It seems that ArtCenter may have been the exception. By all accounts she swaggered there with the confidence of a young person more skilled than some of her teachers. She laughed to recollect stupid assignments from a woman Pat believed “got her teaching job via some monied connections.” When another teacher assigned his class to draw a group of people reflected in a mirror, Pat made one of her people a vampire, just to be a smartass. “ArtCenter was so humorless,” she said. Pat had little patience for pampered, pretentious people—not when she had to do things the hard way.

“My biggest life regret is that in my 20s and 30s pickings were pretty slim for me to use my talents,” she reflected. For her, these were “basically wasted decades—sitting around begging for work doing production and paste up for grubby newspaper ads, and drawing tennis shoes and basket balls.”

She was a hardcore commercial artist who often worked as the only woman in *Mad Men*-type advertising environments. She did uncredited, poorly paid, creatively impoverished work advertising cigarettes and laying out the Yellow Pages. She did work for *Hustler* magazine. She endured the humiliations of wandering hands, stolen ideas, and open sexism for the privilege of doing the one thing she lived to do: making pictures, any way she could.

What kept her going were the too rare occasions when she got to flex her creative muscles: album covers, movie posters, or even packaging for the Smurfs. “The best thing about [the Smurfs] for us artists,” she said, “was that the company grew so fast that nobody was watching the art department and a lot of people created some really great stuff. Until the suits got organized enough to take control again.”



“We actually didn’t plan to start Skeptics Society as a big deal,” Pat reflected. “We just wanted to do a good job.” When the magazine started, maverick no-budget work in an unheated garage was old hat to Pat. Everything in her career was a guerilla campaign. But *SKEPTIC* was different for Pat in one crucial respect: *she got to make the pictures she wanted for a cause she believed in.* She never looked back. She devoted the rest of her life to that work.

It wasn’t always picnics and rainbows. She and Michael were very different people. There were lean and chaotic years, staff who didn’t work out,

distributors that went bust. The magazine industry took one hammering after another.

Pat stuck it out, year after year, decade after decade. “I always say to myself, ‘It’s better than doing Joe Camel,’” Pat said. But it was more than that. The truth is, Pat had a quiet, patient, implacable determination to make the world a little better through her work at the Skeptics Society.

She came to the city with the realism, stoicism, and toughness of life on the farm. She had few illusions about humanity, and absolutely no delusions of grandeur. She was an incrementalist, not a revolutionary. She just believed, truly and deeply, in the value of plugging away.

“Do not expect to create a rational Utopia,” Pat cautioned. “You are moving the ball down the field—scoring a victory here, raising your voice against irrational thought there, and lighting the proverbial candle in the dark whenever you can.”

That was a mission I could believe in.



Having come up the hard way, Pat delighted in mentoring emerging illustrators. As we struck up an online friendship by email, she insisted on re-viewing my portfolio. She gave me frank, generous, real world advice—pitfalls to avoid, pro tips about the industry, and plenty of straight up critiques of my art. Meeting Pat made me a better artist almost overnight.

I don’t quite know how to describe this to non-artists, but Pat’s art was utterly old school. She was a *really* good illustrator whose practice was oriented in a very specific way.

When we look around our homes or the grocery store, almost every object we see was made by an artist. We don’t know the names of the people who designed that shampoo bottle or the ketchup label or the hood of your car. We never even think of them. Pat was part of that invisible legion.

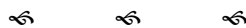
Her practice was forged in a world where artists are uncredited service workers and clients demand fast, cheap, *and* good, all at the same time. Her illustration was without frills, without ego, and lightning fast. Most of her work was unsigned. Every piece was exactly what it needed to be—no less, and no more. Commercial artists aren’t there for flair or personal style. They’re there to serve the client’s needs and (hopefully) get paid.

Pat’s command of fundamental drawing skills was phenomenal, but surprisingly easy to overlook.

Her illustrations were designed to tell the stories they needed to tell. If “simple” would do the trick, simple is what she would do. None of her work was designed to make us think, “Wow, this artist is really good!” She didn’t care about being seen. In fact, she mostly preferred not to be. She toiled in service. She never showed off. “I do about 10 different styles in *SKEPTIC*,” she told me in those earliest emails. “If there is not an artist mentioned in the margin, chances are I did it.”

Her goal was not to be known, but to craft an aura of competence in support of the *ideas* discussed in the magazine. As she explained in an interview, “People often don’t understand [art’s] purpose, but they know it when they see a good job.” She considered her job done well if *SKEPTIC*’s production values gave readers a subconscious impression of professionalism. “They don’t even realize that it’s the design work or the artwork that’s making them think that.”

You’d better believe I paid attention to Pat’s lessons! I didn’t always follow her exact advice, but I made darn sure I strengthened any weakness she found in my work. One of the first things she taught me was a greater willingness to “kill my darlings.” Let’s say this corner of a piece has the most virtuoso lines, the most perfect detail, and that draws the eye. That’s only a good thing if your eye is *meant* to go there. If not, that detail’s got to go. Pat was ruthless about painting out beautiful details that didn’t belong. She was precious about nothing. The “read” of the finished piece was the only thing that mattered.



I did various volunteer illustrations for Pat for a year or so. We kept up a cheerful correspondence. And then, one day, out of the blue, she unexpectedly became that powerful person who opened a life-changing door of opportunity for me as a young artist.

When *Junior Skeptic* was first created, nobody quite knew exactly what it was meant to be. Various people tried to make it work in short stints with middling success. The task kept falling back on Pat herself. Problem was, making *Junior Skeptic* was basically a full time job—and Pat already had one.

There was a need for another person who could take *Junior Skeptic* and run with it on an ongoing basis without much supervision. The surprising suggestion that I could perhaps be that



Photo by David Patton

person arrived as a casual email postscript: “P.S. If you were going to do a whole *Junior Skeptic* on some major topic—writing and art—what topics might you like to do?”

Me? Really? I had *some* background in creative writing, but no thoughts at that time about writing professionally. I’d never even considered non-fiction, let alone non-fiction for kids.

As it turned out, I owe my entire career as an author to this bit of blind, dumb luck: veteran artist, skeptic, and cow enthusiast Pat Linse just happened to like the way I wrote emails.

Often about sheep.

“As soon as I noticed you had a knack for simple straightforward writing,” Pat explained, “I thought, ‘I ought to give him a try on *Junior Skeptic*.’”

I was very nervous going into my first issue, *Junior Skeptic* #14. I picked a topic that shored up my confidence—the obscure cryptid Cadborosaurus, which I already knew a lot about. Then I threw myself into research and scrambled to learn how to use SKEPTIC’s layout software and become proficient with Photoshop. Pat guided and encouraged me the whole time. I think I spent five months working on that story for a small honorarium. The cover alone took weeks. It featured a hand-sculpted monster model composited into heavily modified location photography.

Here I’m going to share some absolutely glowing compliments Pat gave me when she saw the finished art for that cover—not for vanity, I hasten to add, but because this so perfectly captures Pat’s expansive generosity as a mentor and boss:

You probably know that it’s a great piece—but if you are like me you are still seeing all the little things that might have been a problem, so you don’t know how really, really, really, *really* good it is. It’s fabulous. I love it. Great. What I like is it radiates the delight you took in the subject matter.

Thinking back on those comments still fills my heart with love and loyalty for Pat. Here’s the thing: this wasn’t a transaction for her. She genuinely cared about the creative success of the artists she worked with. “I really hope you can work with us a lot,” she said, “so you can continue to work in this area, and produce some more great stuff in an environment that nurtures your talent.”

And so, *Junior Skeptic* became my baby. Pat and I worked together as a creative team for almost two decades—trusting and supporting one another, griping together, geeking out together. We had each other’s backs. We accepted each other’s quirks. I don’t think a harsh word ever passed between us.

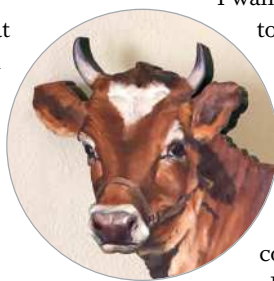
Over the years I had many opportunities to thank Pat for putting her faith in me. She always waved it off, saying she just had good judgement in finding a self-starter she could rely on. The deeper truth is that she did not want to see younger artists squander their talents on “wasted decades” as she was forced to do. As she told me, “just be glad you got into something you could really sink your teeth into before you wasted too much time!”



Many of these tributes mention Pat's shy and private nature. It's true. She was very private. In some ways, perhaps I never knew her well. Indeed, I worked with her for two or three years before we even spoke on the phone. I had no idea what Pat looked like when I started.

We were work friends. But we were *close* work friends, for a very long time—and *Pat's work was the vital center of her life*. She shared a house with her adult niece, but she spent all her time at the office. She was routinely still at her desk late into the night. She rarely took vacations, weekends, or even sick days off. When she spoke, she spoke about art and skepticism. When she socialized, she socialized with skeptics.

Outside of art and skepticism, her life was positively spartan. When I visited the California office, Pat kindly put me up at her house. I slept on the floor in a room without any furnishings whatsoever. The only object in that room was an almost life-sized cow cutout she painted in art school. The brush strokes on that cow were dazzling.



Pat and I were kindred spirits in many ways, but we were hardly clones. She was amazingly set in her ways. I mean, she literally used an AOL email account until the day she died. I was shocked when I first saw her scrunched in her office, peering owlishly through her foggy, scratched, oversized eyeglasses at her old CRT monitor. There was a travelling scan line glitch endlessly scrolling down her screen. "How on Earth are you making art like this?" I exclaimed.

She steadfastly refused to upgrade software or hardware until they simply stopped working. She would not change makeshift kludges she'd discovered decades earlier. If she had a solution that worked for her in the past, that was what she did.

Much has been mentioned about her liberal politics. She was progressive by the standards of her generation, but I regarded her as a bit conservative in some ways. Like some other feminists of her age, she seemed a little suspicious of some newfangled intersectional ideas that I found pretty useful.

But we spoke the same language about art and skepticism. Pat's vision of skepticism was very practical. She wanted to keep her personal political and religious beliefs out of her work. She wanted skept-

cicism to be a reliable source of science-informed insight and information for *anyone who wanted it*—not just people like her. She wanted to give every idea a fair shake, too. Paranormal proponents would phone the office all the time, and she was happy to respectfully engage with them.

We were similar in another respect, too. There are people in this world who want to be front and center—metaphorically Harry Potter, King Arthur, or Captain Kirk. Then there are people who want to be Hermione, Merlin, or Mr. Spock. Pat was emphatically one of the latter. She did not want to be famous. She just wanted to get things done.

At a certain point I reluctantly decided that my ideological priorities were more important to me than my own shyness. I had ideas about skepticism

I wanted to share. No one was going to listen to my ideas if they didn't know who I was.

Pat never made that decision. Instead, she deliberately chose to remain in the background—largely unknown to the public, yet a wise and firm leader and den mother to her skeptical friends and colleagues. *They* could carry Pat's convictions into the public sphere.

Her influence on modern skepticism was invisible, yet immense. She was never the one on stage, but she was known and respected by the people who were. My friend Barbara Drescher accurately described Pat as "one of the most competent persons I've ever met."

Pat may have preferred a low profile, but it bothered *me* that she so rarely received the credit she deserved. I promoted her work whenever I could. When I cajoled Pat into contributing written remarks to a large group project in 2009, another organization described the participants collectively as "luminaries." Pat was tickled by this, chuckling, "Cool—I'm a 'luminary'!" I responded with fondness and exasperation, "You always were, silly! You just forgot to tell anyone for 20 years."

But that's the very thing, isn't it? Pat lived and died on her own terms. She spent decades digging her way out from under the constraints of small town life, traditional roles, mediocre teachers, sleazy clients, and other people's expectations. If she had some quirky way she liked to do things, well, she was the boss! We could damn well adapt.

Pat Linse lived as she liked, doing the things she loved, for reasons that mattered to her. She was stubborn as hell, and sharp as a whip. She made her own mold. We will not meet another quite like her. **S**

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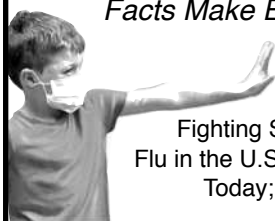
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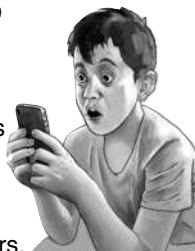


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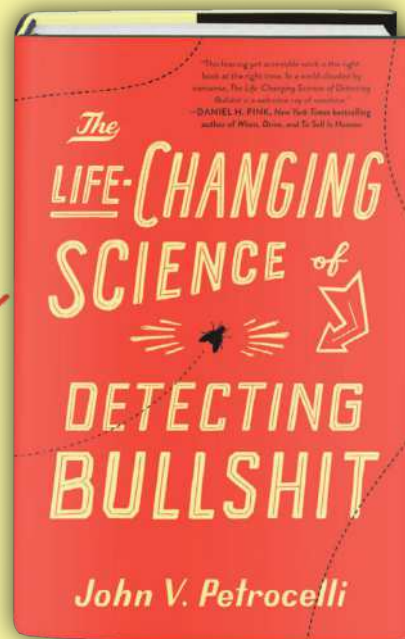
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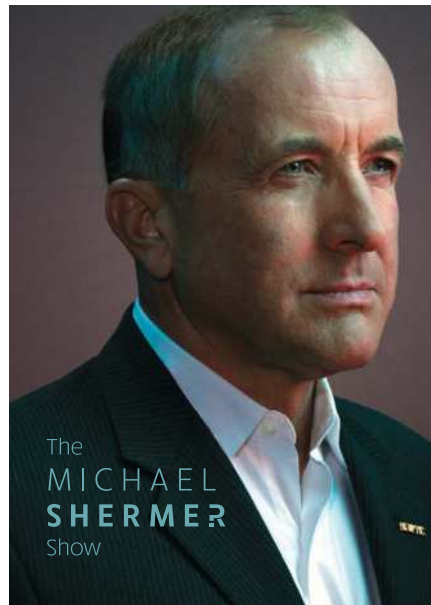
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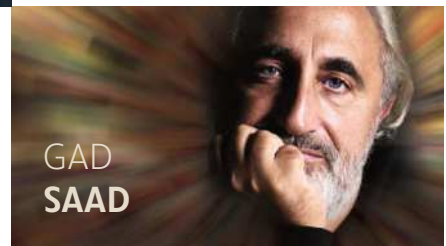


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