

P PRIORITIES

Nudging University Research Frameworks into the 21st Century p. 6

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SUSTAINABILITY THREATENS PUBLIC HEALTH IN THE DEVELOPING WORLD

Mikko Paunio MD, MHS p.14



AMERICAN COUNCIL
ON SCIENCE AND HEALTH

Why We Fight

*Hank Campbell, President
American Council on Science and Health*

{ When I was a young Army officer, I first had the opportunity to see Frank Capra's "Why We Fight" series. It was on PBS and introduced by Edward Herrmann. Capra had created them in World War II for the military, to show young soldiers why they were going to war. It remains fantastic to this day, with spiders shaped like swastikas crawling across Europe, courtesy of Disney, and chilling actual footage of a war no one could figure out but knew had to stop. Today, the series is considered propaganda, but if we lived solely in a world of postmodern Quislings, who think evil is relative, there would have been no British rescue at Dunkirk, no Midway, no sprint to save American soldiers in the Ardennes. We had to be inspired to fight.

Science and health are not morally relative either, though the intellectual descendants of Quisling insist they are. Hardly a week goes by that a journalist at the New York Times isn't endorsing acupuncture or manufacturing a science conspiracy around agriculture or whatever else will sell an online ad pageview. And those are the simple issues. Complex ones really get mangled.

We often broadcast our editorial meetings live on Facebook, so readers can see how we decide what we cover, but a week or so ago I said we would not do that, because we were going to cover a topic that would involve a lot of arguing: pregnant women. My contention was that in America, pregnant women, and working mothers in general, are under constant siege. If you don't breastfeed exclusively

for two years, you are a bad mom. If you don't arrange play dates that are educational, bad mom. Don't buy organic? Bad mom. That week, one study came out saying that any trace level of alcohol during pregnancy could cause a birth defect and therefore we should implement abstinence only for pregnant women. Another study said the data were inconclusive so the precautionary principle must rule. Meanwhile, European studies found that women who drank even a glass of wine per day had no more birth defects than women who drank nothing.



This is complex. Alcohol goes into the bloodstream and if it goes into the bloodstream of a mother it is basically going into the baby. Given that there is conflicting data, and that the Usual Suspects on social media - journalists with an agenda, activists who want to scaremonger everything so they can sue over it - were going to lambaste us if we said it could be safe for pregnant women to drink a modest amount of alcohol, should we discuss it at all, I was asked? That's exactly why we need to cover it, I replied. If we can't figure it out, how can the public trust recommendations are an informed decision?

This is why we fight.

We still haven't come up with an answer because it is complex and we want to get it right. Journalists are so easily duped by weak observational studies because they don't understand statistics, and correlation is easy to make if you take any set of data and keep coming up with hypotheses until you get statistical significance for one. The claims anyone can make

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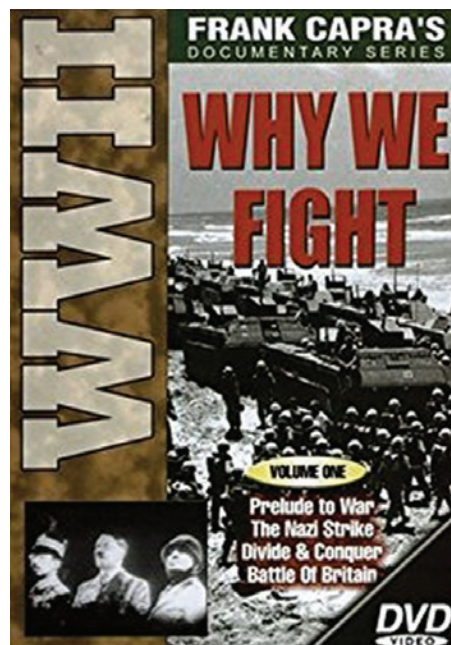


AMERICAN COUNCIL
ON SCIENCE AND HEALTH

using statistical significance are provocative, they will get attention, and that is "sexy" to editors. I wrote an article noting that in the past, experts insisted that not only should pregnant women be forbidden from playing sports, they should be prevented from watching them. The excitement would be too much for the baby. Other experts said women shouldn't hang laundry or the umbilical cord might get wrapped around the baby's neck. Maternity corsets were recommended for wealthy elites in the 19th century. Environmental litigators CSPI spent a decade insisting coffee caused breast cancer, and when we debunked them, they commissioned an environmental journalist to write a whole book slamming our work. Today we have BPA and aspartame and wheat all putting pregnant women in a panic.

We know fetal alcohol syndrome is caused by too much alcohol, but now there is the word "disorder" attached to the end, which means any range of behaviors can be attributed to any intake of alcohol. Is it mommy shaming by our Puritan heritage? Or are European women rolling the dice and just getting lucky?

We don't know yet. Science is complex. But we know homeopathy is fake, so one drop will not cause a birth defect. And



we know how much alcohol can cause health problems for larger humans, so we can infer where it will happen to a fetus. We understand dose and risk. We don't lower the speed limit to 5 MPH even though basically no one could die in a car if we did. We show policy makers how to create informed decisions.

No one is going to throw money at us for producing a white paper on alcohol and pregnancy. Instead we will be criticized because we don't preach abstinence only. But it's why we fight. It's why you donate so we can fight for evidence-based thinking, even if you don't agree with all of our results. That is the beauty of being part of the pro-science community.

You make all of it possible, and it is why we are happy to fight for you. }



Turning up the Heat on the Noble Lie

Dr. John Dunn, M.D., J.D.

{ The EPA insists that poor air quality in America is a terrible killer and must be regulated regardless of the economic burden imposed. But with no evidence to justify such a claim, this is nothing more than a Noble Lie.

Steve Milloy, a biostatistician and lawyer, conducted a study to examine if small particulate matter in air pollution was linked to acute deaths. Using publicly available death certificates, he found no such correlation. Furthermore, using hospital discharge data, he found no link between ozone levels and asthma attacks in the Sacramento area.

In March 2017, James Enstrom published a paper that reanalyzed the data from the American Cancer Society's Cancer Prevention Study (CPS II), which examined PM2.5 levels and their impact on all-cause mortality.

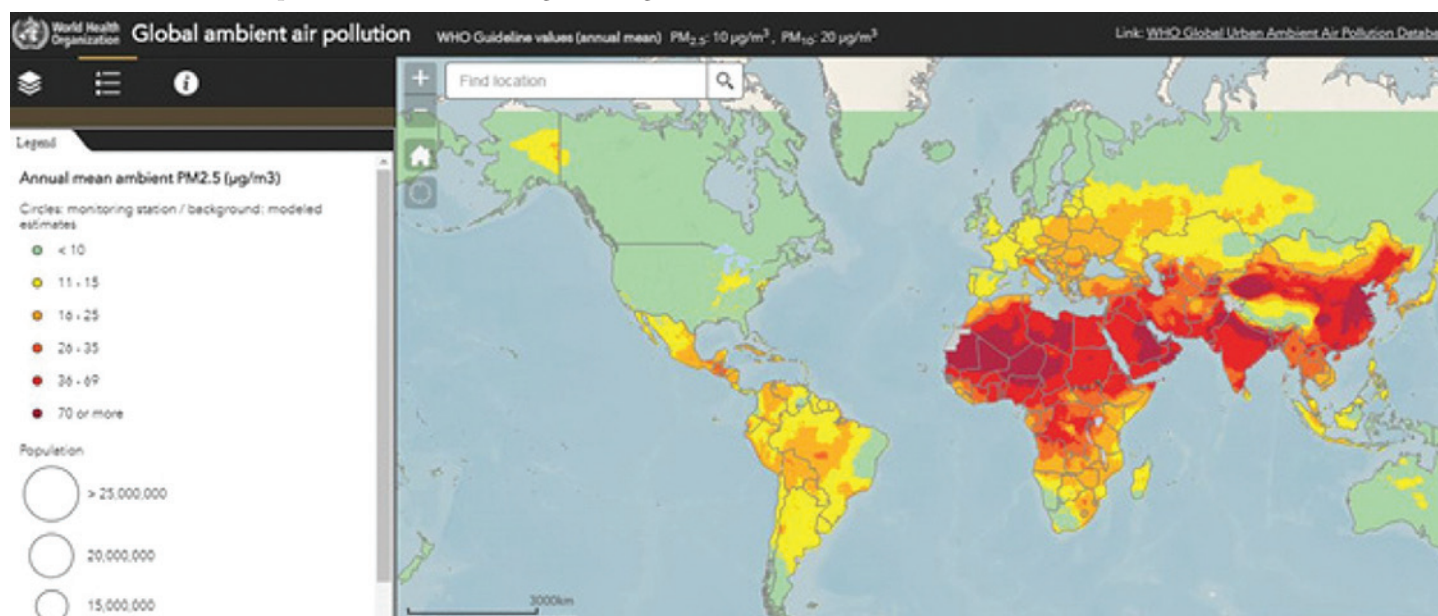
This large nationwide cohort has played a major role in the EPA's justification that fine particulate matter kills thousands of Americans. However, Enstrom's reanalysis showed the positive relationship between PM2.5 and total mortality was based on inferior data. When better data was used, the relationship vanished.

Most recently, in August 2017, Stan Young conducted a study that examined 13 years' worth of data from the most populous air basins in California to determine mortality from small particle and ozone air pollution. Once again, there was no link between mortality and small particle or ozone pollution.

Perhaps the most damning evidence against a link between PM2.5 and deaths is the behavior of the EPA itself. If the EPA really believes that fine particulate matter is killing people, then why did it sponsor research in 2011 that exposed humans of all ages to

health problems in the U.S and it is not considered a risk factor like for cardiovascular disease like smoking, excessive alcohol, poor diet, lack of exercise, high cholesterol, high blood pressure, genetics, etc. are. On the CDC's page for heart disease, air pollution is not listed as a risk factor. The EPA does not have access to data CDC lacks.

All of this goes to show that the EPA and its army of fanatic environmental activists have manufactured a Noble Lie: That Americans are dying from air pollution and something (that is, burdensome, anti-business regulations) must be implemented. To reach this conclusion, the EPA ignored negative evidence and advanced small associations that did not stand up to further scrutiny. In reality, the U.S. has some of the cleanest air in the world. Just check the maps published by the World Health Organization, such as this one.



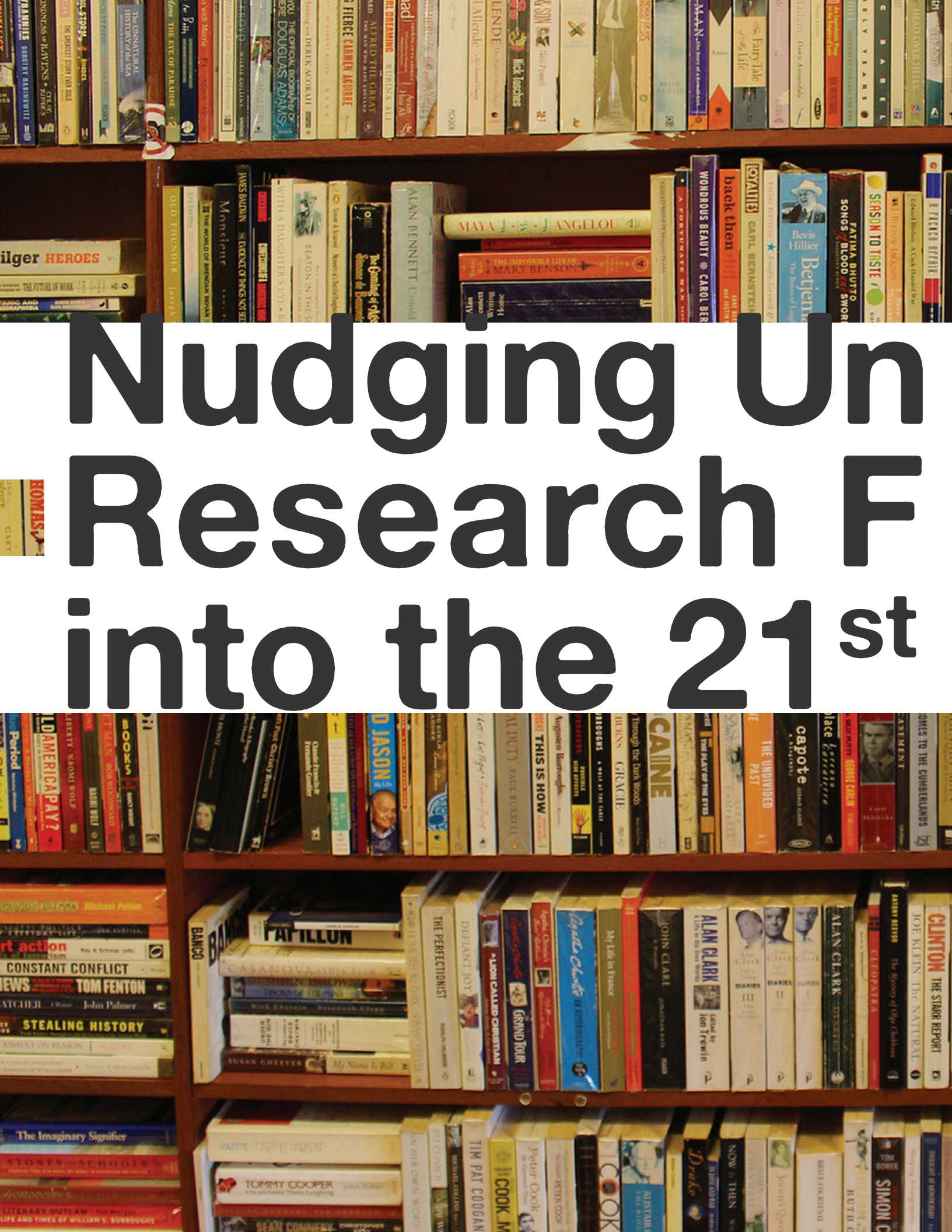
air pollution in order to determine its effects on the body? Was the EPA really okay with hastening people's deaths? If the EPA truly believed its own propaganda, then it was knowingly subjecting people to toxins that would shorten their lives. Logically, Milloy filed a lawsuit to stop these unethical and illegal human experiments, but the suit was dismissed due to lack of standing.

If you visit the website for the Centers for Disease Control and Prevention, PM2.5 is not listed among

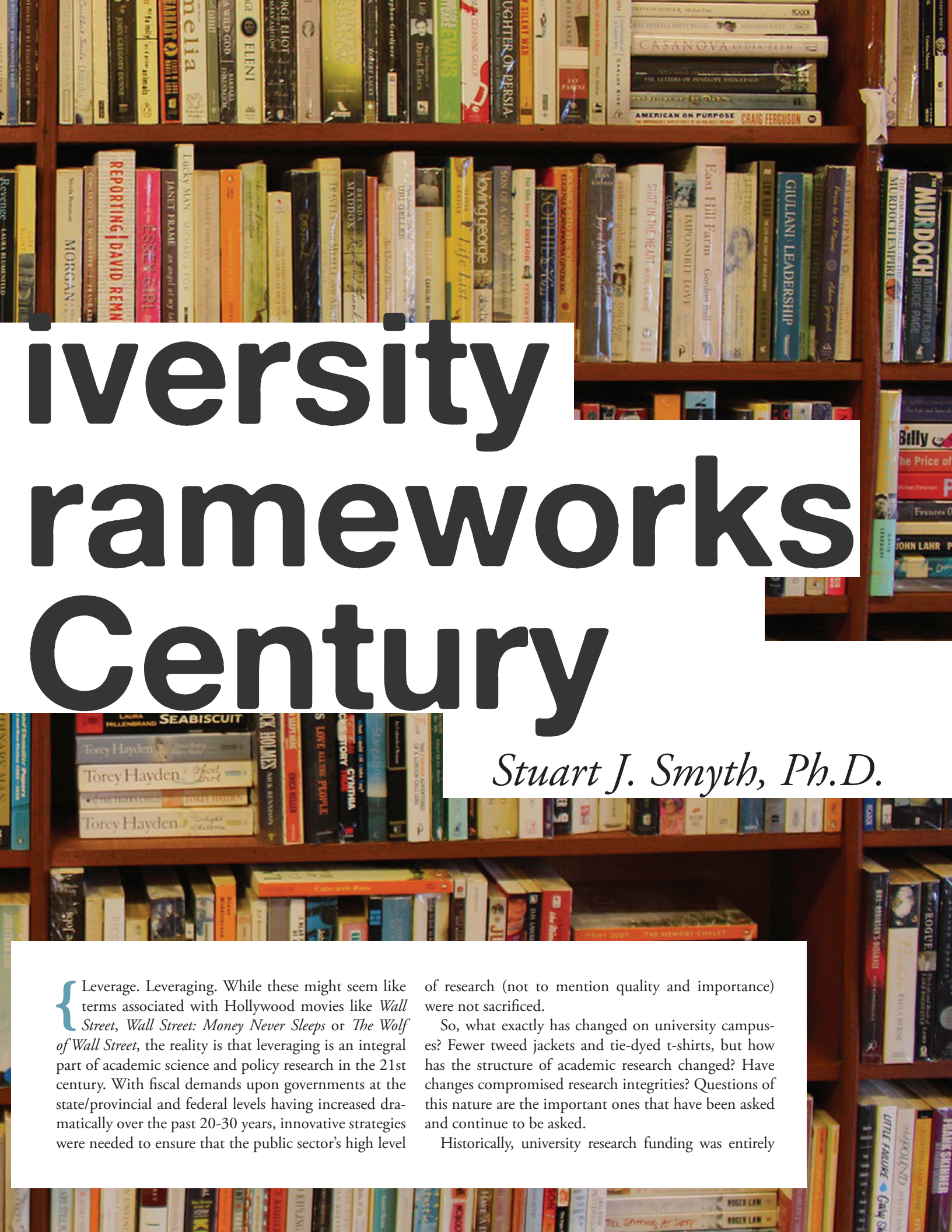
Chinese people have greater longevity than Americans. If we were using EPA's junk science methodology, we could argue that poor air quality helps people live longer.

This will not be the end of the hysteria over air quality -- since a fanatic true-believer army is already assembled -- but it may be the beginning of an effort to stop junk epidemiology from justifying dubious policies built on a foundation of Noble Lies. }

John Dale Dunn, M.D., J.D., is in Civilian Faculty Emergency Medicine at Carl R Darnall Army Medical Center, Fort Hood, Texas



Nudging Un Research F into the 21st



iversity Frameworks Century

Stuart J. Smyth, Ph.D.

{ Leverage. Leveraging. While these might seem like terms associated with Hollywood movies like *Wall Street*, *Wall Street: Money Never Sleeps* or *The Wolf of Wall Street*, the reality is that leveraging is an integral part of academic science and policy research in the 21st century. With fiscal demands upon governments at the state/provincial and federal levels having increased dramatically over the past 20-30 years, innovative strategies were needed to ensure that the public sector's high level

of research (not to mention quality and importance) were not sacrificed.

So, what exactly has changed on university campuses? Fewer tweed jackets and tie-dyed t-shirts, but how has the structure of academic research changed? Have changes compromised research integrities? Questions of this nature are the important ones that have been asked and continue to be asked.

Historically, university research funding was entirely

undertaken by government, government agencies or government funded, arms-length granting councils. This approach worked well when most scientists had small research laboratories with a few graduate and post-doctoral students contributing to specific research projects. One of the predominant reasons for this structure to change was driven by information and technology communication (ITC) advancements. Where previously, leading academic scientists would compete against each other through a grant process, the ability to use computers allowed leading academics to partner on a grant proposal, increasing the scope and scale of the proposed research.

While some grant proposals had previously required private sector contributions, either cash or in-kind, around the turn of the millennium, this changed dramatically. At this time, research proposal calls from granting agencies required increased levels of matching industry funding, ranging from 25% to 60%

Very quickly, the size of a large research grant proposal went from six figures to eight. Thirty years ago, a grant of \$200,000 or \$300,000 was a significant grant that would allow a research laboratory to be adequately funded for several years. Fifteen years later, this amount of money would be enough to fund three months of research as grant requests grew to be in excess of \$10,000,000. Today, grants reaching into the \$20, \$30 and even \$40 million dollar range, over five to seven

years, are increasingly common. The change in the dynamics of research grant proposals has been substantially impacted by ITC innovations as the ability to form a research network of leading academics at various universities is now the norm. The ability to connect academics, scientists and laboratories via ITC advancements has resulted in a research environment where several of the leading researchers within a particular discipline now collaborate in developing research proposals and conducting the research.

A parallel driver to this redesign of funding research frameworks has been driven by the granting agencies themselves. As governments grappled with the rapidly increasing fiscal demands of baby boomer populations approaching retirement age, greater investment increases into health and public services were required. Some politicians viewed research funding as an evident source from which to reallocate funds. As granting councils faced increased competition for federal fiscal resources, it was realized that to be able to continue funding the existing levels of research, let alone the ability to increase research funding opportunities, innovative strategies would be required.

While some grant proposals had previously required private sector contributions, either cash or in-kind, around the turn of the millennium, this changed dramatically. At this time, research proposal calls from granting agencies required increased levels of matching industry funding, ranging from 25% to 60%. Leveraging federal research contributions allowed granting agencies to effectively double the amount of research that could be funded through any call for research proposals.

The effect of this has been to push academic research further downstream in terms of commercial potential. While there are still funds available to academics to

engage in research impartial to private funding, known as 'bluesky' research, funding for these initiatives has decreased. Partnering with the private sector has changed the design of research proposals to be more specifically focused on private industry problems and research designed to overcome or reduce these problems. To a large extent this is a natural evolution of the impact that the ITC revolution has had on academic research. The ability of academics and industry to collaborate to respond to real world problems is evident for example in research such as the rapid responses to disease outbreaks like Zika.

The issue of research integrity is an important one and universities have taken numerous steps to ensure that academic freedom is the top priority for any public-private research partnership. When a successful grant is awarded with matching private sector funding contributions, complex and detailed contracts are prepared and signed by all organizations that are a partner to the grant. These legal agreements include details on how intellectual property will be shared or protected, how materials can be transferred between laboratories and how fiscal contributions will be made to the specific university. These contracts ensure that private sector firms do not have the ability to change or influence research results that may not be to their liking or interests. Predominantly, these are agreements between institutions. As a nature, academics never directly receive matching industry contributions directly into their research programs, the contributions are made to the university and the funds are allocated to a specific grant that is then monitored and reported on by the specific university's financial reporting department. These reports are provided on an annual or semi-annual basis to the granting agency.

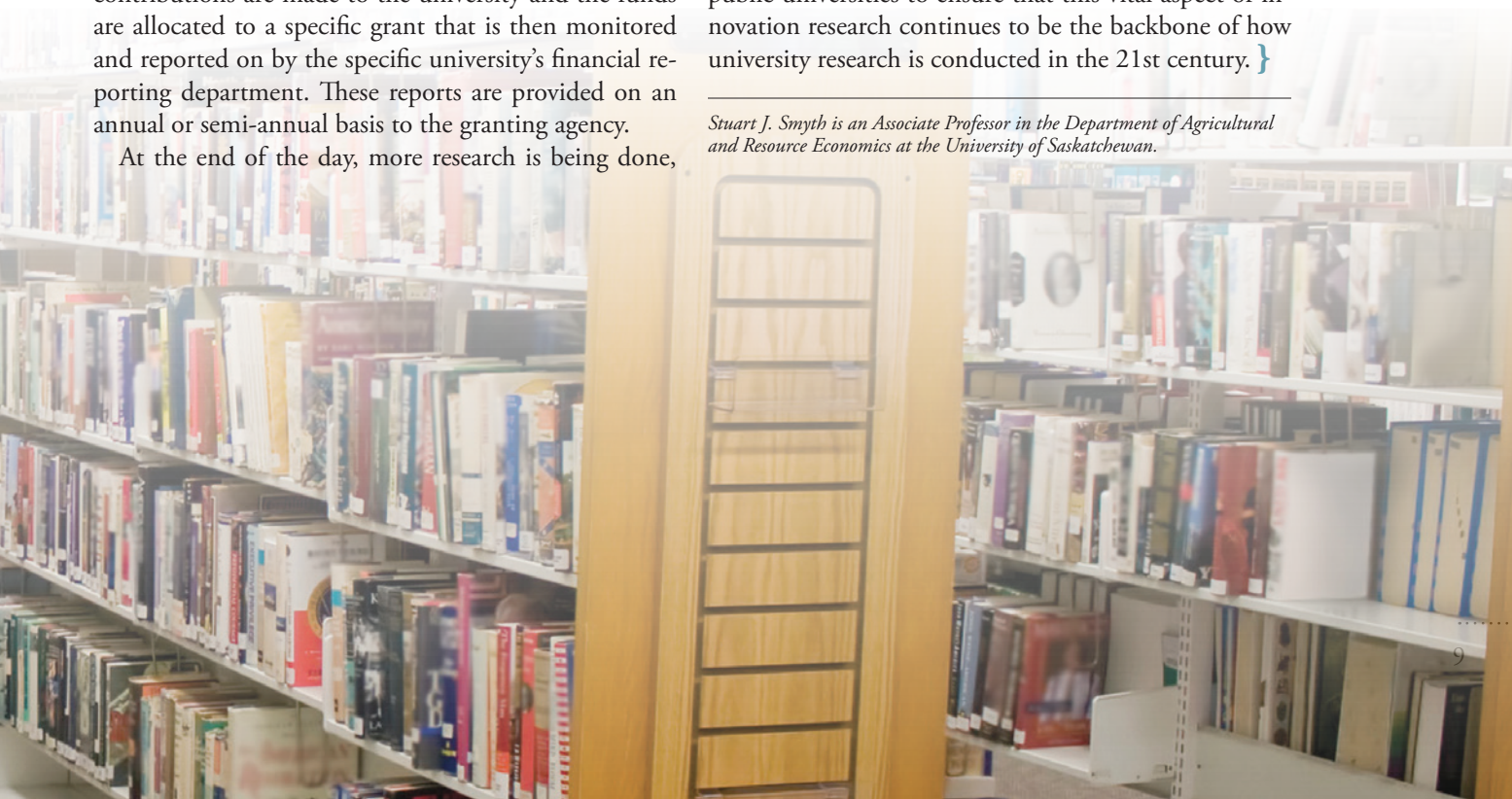
At the end of the day, more research is being done,

by more leading researchers, in more universities than was possible under the previous framework. The benefits of this are new products, technologies and drugs for society. Frequently the research leads to the establishment of new companies, creating new employment opportunities. High quality research attracts high quality scientists, resulting in improved student learning opportunities.

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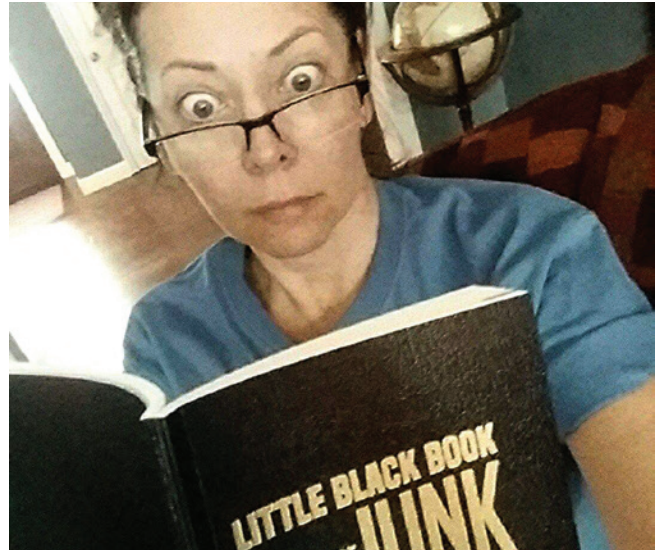
Protocols have been implemented to ensure that academic research freedoms are an integral part of this interactive research partnership. Innovations within both ITC and granting agencies have provided substantial social benefits from the increased level of research being conducted at campus' across the nation. While society reaps the vast majority of the benefits of the research results, benefits must exist for the private firms and the public universities to ensure that this vital aspect of innovation research continues to be the backbone of how university research is conducted in the 21st century. }

Stuart J. Smyth is an Associate Professor in the Department of Agricultural and Resource Economics at the University of Saskatchewan.





The Council staff stuffing books into envelopes for donors. You know who doesn't stuff their own envelopes? Environmental groups who claim the science community is all secretly a conservative political conspiracy.



Dr. Cami Ryan reading our Little Black Book of Junk Science. It's that good, folks.



Hank Campbell, Ed Calabrese, Professor of Environmental Health Sciences, University of Massachusetts, and Terence Kealey, Visiting Senior Fellow, Center for the Study of Science, Cato Institute.



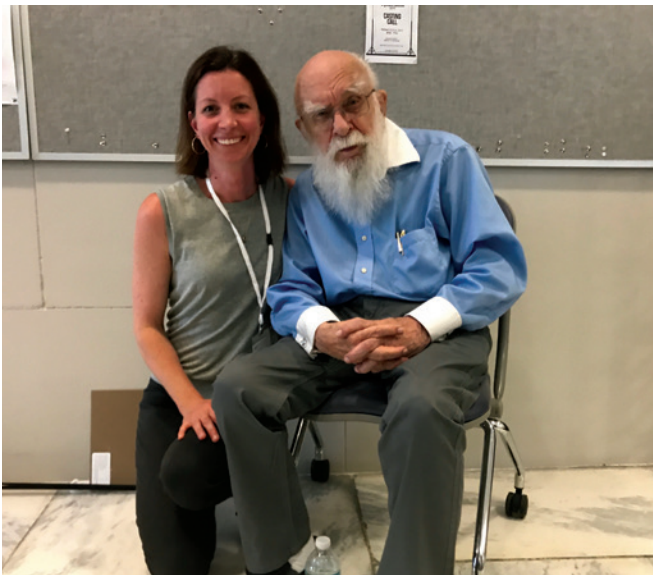
Hank Campbell, Dr. Sally Satel.



Dr. Jamie Wells, judge at the Miss America's Outstanding Teen Competition, with winner Jessica Baeder of Alabama.



Dr. Julianna LeMieux preparing to enter the offices of the Congressional Committee on Science, Space, and Technology.



Dr. LeMieux with the Amazing James Randi, who famously exposed charlatans like Uri Geller and was a staple on the Johnny Carson show.



Our panel on exposing junk science with Dr. Angela Logomasini, Senior Fellow at Competitive Enterprise Institute, Dr. Alan Moghissi, charter member of EPA, Professor Nina Federoff, Professor Emeritus at Penn State University and former member of the Presidential National Science Board, Dr. Alex Berezow, Senior Fellow at the Council, and Council President Hank Campbell.

Slower Yields and Other Benefits of Organic Agriculture

Ralph C. Martin, Ph.D., P.Ag.

{ A review paper recently found that organic crop yields are 19-25% lower than conventional systems.

However, in a recent visit to the University of Guelph, Carlo Leifert of Newcastle University noted that organic wheat yields at their Nafferton Farm were beyond the conventional wheat yields of the 1980s. He suggests that while organic yields may be lower at any given date, they also keep rising. If more science was applied to organic agriculture, scientists and farmers could develop specific varieties and methods to enhance organic yields, as well as attendant ecological benefits.

The cost of agricultural intensification over the last 40 years has been a 5 to 7 fold increase in nitrogen, phosphorus and potassium use. The gain has been a 2 fold increase in global food production. How will energy shortages, declining supplies of mined phosphorus and too much moisture or too little moisture, at the wrong time, affect crop yields?

Could organic food be a version of Aesop's fable, in which the hare bounds ahead of the tortoise and then takes a snooze because he is so far ahead, allowing the

persevering tortoise to win the race?

• The cost of agricultural intensification over the last 40 years has been a 5 to 7 fold increase in nitrogen, phosphorus and potassium use. The gain has been a 2 fold increase in global food production. How will energy shortages, declining supplies of mined phosphorus and too much moisture or too little moisture, at the wrong time, affect crop yields?

The benefits of organic agriculture (in our version of Aesop, the yield tortoise) as cited in the first paper and elsewhere, are not yield but that organism abundance is higher (an indicator of greater biodiversity), soil organic carbon is higher (an indicator of soil health), water holding capacity and water infiltration rates are higher (beneficial in times of excess rainfall as well as deficient rainfall), soil erosion is lower, energy use is lower (due to the non-use of nitrogen fertilizer which requires high energy inputs when manufactured), limited phosphorus from mines is lower, some find pesticide residues in food are lower and, some claim, antioxidant levels in food are higher.

Yields are how we feed people for low cost but when farmers talk turkey with bankers, it is all about profit. At Washington State University, a 2015 paper showed that profits are 22 to 35% higher on organic farms. That means even with lower yields, premiums of 5 to 7% were sufficient to match profits on non-organic farms.

Organic organizations choose to forgo the use of syn-



thetic fertilizers and pesticides and genetically modified organisms (GMOs), and thus accept slower yield gains, because of the precautionary principle. The International Federation of Organic Agriculture Movements in the principle of care, states that “organic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.” America no longer has a food sufficiency problem but worldwide organic agriculture is not yet viable. To feed 9 billion people, no science body claims the organic process can do it. China, which only recently had enough wealth that people could afford to eat meat, has already said they will cut the 63 kilograms of meat per person they consume by 50%.

The Western world has plenty of food but food aid doesn't get to the 20 million people at risk of famine in Somalia, Yemen, northeast Nigeria and South Sudan. If food were more of a commodity, warlords would not

steal it. Improving low-input food production in those countries, where inputs are already limited, may be effective long term strategies.

Today it is estimated that Canadians waste 40% of food along the entire value chain. Let us suppose that agriculture had evolved differently and that we produced organic food with yields about 25% lower than they are today. Let's also imagine wasted food was reduced to 15%. In a society of only 15% wasted food, we would not aspire to produce 25% more food so that we could waste 40%.

Conventional yields have been higher than organic yields for decades and the hare-tortoise race outcome seems inevitable. However, we still don't know. To paraphrase the late Stuart McLean of CBC radio, “in the organic sector, we may not be fast, but we're slow.” }

Prof. Ralph C. Martin is in the Department of Plant Agriculture at the University of Guelph.

SUSTAINABILITY THREATENS PUBLIC HEALTH IN THE DEVELOPING WORLD

Mikko Paunio MD, MHS



{ Current conservation policies often clash with public health initiatives in the developing world but they get little attention. There are real harms in advocating water and energy conservation over people.

We take sanitary practices for granted in wealthier countries but hygienic practices require water in quantity and uninterrupted power to supply that water and related sewage systems. Those really help countries that need it most yet those are two things that environmental groups and governments in Europe and North America often oppose. Reports from the World Health Organization and the World Bank have found that lack of water and energy affects 800 million people around the globe. Decentralized heating and cooking in homes in the urban areas of the developing world account for most ambient air pollution and perhaps 80-90 % of the WHO estimate of up to 6.5 million annual deaths linked to such air pollution.

Instead of addressing those issues in the most practical way possible, the US in 2013 declined multilateral (World Bank) aid to build centralized power plants in the poorest countries – because to be affordable they had to use coal. Instead, the US government sided with WHO and Dr. Margaret Chan and insisted on climate change mitigation for poor countries while giving China unlimited emissions until 2030.

Where did we go wrong? When guiding the "Our Common Future" report, Director General of the World Health Organization Dr. Gro Harlem Brundtland chose to deny crucial infrastructural urban development, such as the provision of fresh water supplies and the installation of sewerage systems, unless it could be done "sustainably". But the countries that need such infrastructure are often unable to raise capital on their own and need

multilateral assistance from rich countries. By mandating they could only have loans if they agreed to build things that would be too expensive, we doomed those countries to failure.

What has been little discussed is how those initiatives made western governments feel good while dooming developing nations. It has long been known that infectious diseases acquired before the age of one permanently affect the nutritional status of an infant, especially when the infections are frequent or virulent. Just over a decade ago, WHO and the World Bank attributed 50 percent of consequences of undernutrition to unhealthy environments. These are all easily solved – unless sustainability policies triumph over food and sanitation.

Direct human household consumption of water is only 11 percent of all total global consumption of water: this is small especially when compared to water consumption by the agricultural sector but the weight of evidence shows it is vitally important. Yet it is being left behind.

It wasn't always this way. The WHO and its predecessors once emphasized the provision of fresh water and sewerage infrastructure in urban areas. These measures contributed greatly to the public health miracle that was mainly experienced by OECD-countries. Moreover, that agenda enabled the liberal per capita use of tap water by households, communities, hospitals and industries for a variety of hygiene purposes. Today, the current sustainable development agenda is dominated by conservation policies that pay little attention to the health protection needs of the poor. }

Mikko Paunio MD, MHS, is Senior Environment Specialist in the World Bank and adjunct professor in general epidemiology at University of Helsinki.



How Rachel Gave Birth to

{ Over fifty-four years since it was first published, Rachel Carson's *Silent Spring* remains a divisive book. The exposé led to the birth of the modern environmental movement and the banning of DDT for agricultural purposes. Fans hail Carson as an empowering whistleblower. Critics brand her as an anti-science ideologue.

The truth is somewhere in between. DDT, the mosquito-repelling pesticide prominently criticized in the book, was not nearly as dangerous to human health as it was made out to be (in real-world doses, it's quite

of malaria, especially in the developing world, saving an untold number of lives. At the same time, the wanton spraying of the pesticide, especially for agricultural use, was prompting insect resistance, precisely as Carson claimed.

○ Carson never actually advocated a ban on DDT, but that was the ultimate effect of *Silent Spring*. When she sadly died of cancer just a couple years after the book was published, readers distressed by the book's disturbing rhetoric clamored for action. In 1972, the newly formed Environmental Protection Agency banned the pesticide for agricultural uses. As a result, countries across the world followed suit, many of them banning DDT outright. Malaria rates, which had been increasingly under control, skyrocketed in countries like India, Sri Lanka, and South Africa. Pampered Americans could live without DDT, but poor people could not.

Netting everything out, Rachel Carson's *Silent Spring* accomplished a few noble aims, chief among them, spurring a resurgence in caring for our environment. But as a work of science, it mostly failed.

"It was short on data and long on anecdotes," pediatrician and science advocate Paul Offit summed up in his recently-released book, *Pandora's Lab*.

Offit went on to describe what may be *Silent Spring's* most damaging legacy.

"Unfortunately, Carson... gave birth to the notion of zero tolerance – the assumption that any substance

Carson never actually advocated a ban on DDT, but that was the ultimate effect of *Silent Spring*. When she sadly died of cancer just a couple years after the book was published, readers distressed by the book's disturbing rhetoric clamored for action. In 1972, the newly formed Environmental Protection Agency banned the pesticide for agricultural uses

safe), but it was adversely affecting many species of raptors, including bald eagles. In the 1950s, DDT spraying programs prevented hundreds of millions of cases

Carson Chemophobia

Ross Pomeroy



found harmful at any concentration or dosage should be banned absolutely."

Carson's vibrant and forceful writing made it all too clear to readers that the pristine "natural" world was full of insidious, invisible, chemical dangers. This nascent fear would eventually evolve into chemophobia, the irrational aversion to chemicals, that runs rampant today. It is no coincidence that chemophobia's modern front person, Vani Hari, the "Food Babe," has been compared to Rachel Carson.

Fifty years after *Silent Spring* was first published, Rob Dunn, an evolutionary biologist and writer at North Carolina State University, hailed the book as a "beacon of reason." In actuality, it stands as a gleaming example of alarmism, empowering those who misrepresent science to support their activist causes. Across four chapters, Carson used anecdotes and high-dose animal studies to argue that pesticides cause cancer, birth defects, liver disease, and a host of other illnesses. Sound familiar? The anti-vaccine and anti-GMO groups of today employ tactics straight out of the *Silent Spring* playbook.

In the end, what Carl Sagan did for skepticism and science-based inquiry, Rachel Carson did for alarmism and anecdote-based activism. }

Ross Pomeroy is Editor of Real Clear Science.

Why I Hate Labels

Maria Trainer, Ph.D.

{ During a panel discussion I was once asked, if I could change one thing about agriculture in Canada what would it be? My answer, I would remove labels. I would get rid of the arbitrary distinction that separates “organic” from “conventional” so we can instead focus on the bottom line: sustainability.

Because ultimately that’s why I do what I do. I’ve been an environmentalist for as long as I can remember. From saving the ozone layer to protecting the rainforests, I’ve been passionate about reducing our carbon footprint and protecting the environment since I was a small child. Which is, in part, how I ended up as a geneticist.

I could write a whole book on why I am excited about the role genetics can play in saving the environment. And it’s part of why I really hate labels. Let’s look at what could go on an organic label, for example. According to the USDA, “Organic is a labeling term for food or other agricultural products that have been produced using cultural, biological, and mechanical practices that support the cycling of on-farm resources, promote ecological balance, and conserve biodiversity in accordance with the USDA organic regulations.”

Promote ecological balance and conserve biodiversity? Where do I sign?! The problem comes at the end of that sentence; “in accordance with USDA organic regulations”.

USDA organic regulations go on to describe organic standards plus the List of Allowed and Prohibited Substances – they are mostly natural, but with dozens of exemptions for synthetic versions. It explicitly excludes the use of so-called “genetically modified organisms”. For a scientist, that is a big issue. The List is entirely founded on a logical fallacy (Appeal to Nature); exempts synthetic stuff they really like even if it’s not organic; creates a false dichotomy that leaves people with the misperception that there are only two choices; and ignores a full spectrum of choices that lie between two apparent extremes (organic versus conventional).

We scientists are trying to promote ecological balance and conserve biodiversity while feeding a growing pop-

with drought-tolerant cultivars of staple crops; and reduce post-harvest waste through non-browning apples and longer-lasting lettuce. I could go on but I think you get the picture...

Modern breeding methods reduce our reliance on inputs like water, fertilizers, and pesticides, and help us feed more people from our existing agricultural lands. As such, they promote ecological balance and help conserve biodiversity and should be absolutely consistent with the principles of organic production. We need all the tools in the toolbox; it seems nonsensical to throw certain tools out of the window because they don’t fit a set of criteria solely developed to describe a labelling standard about a process.

Technology and progress are why Canada’s agricultural soils are now a net sink for carbon and why our biodiversity index has shown steady and consistent improvements since being implemented in 1981. These improvements



ulation projected to reach 9.7 billion people by 2050. The planet isn’t getting any bigger and most of the land that’s suitable for farming is already being farmed, so we can make poor quality land better by optimizing plants for those climates, and continue to get more yield out of our existing agricultural land using fewer inputs.

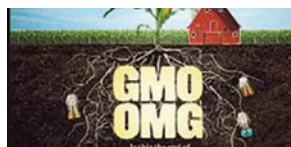
New plant breeding methods can help us meet this challenge. They allow us to develop crops that can deliver essential nutrients to chronically malnourished populations, with applications like Golden Rice or biofortified sweet potatoes; address plant diseases that threaten food security in the developing world such as wilt-resistant bananas and virus-resistant cassava; improve resilience

are the direct result of innovation in agriculture and should be embraced by all farmers. Yet the organic label prohibits their adoption. It makes no sense.

We need to all be pulling in the same direction to maximize yield while minimizing environmental impact. Labels create a false dichotomy that leaves the public thinking that they have to pick between two opposing philosophies. It’s a lose-lose situation, and the biggest loser will be the environment that we are leaving for future generations. So let’s do away with the labels and focus on finding the best tools for the job. }

Maria Trainer, Ph.D., is Managing Director, Science and Regulatory Affairs at CropLife Canada.

Since Netflix declined to carry the pro-science "Food Evolution" documentary, we took a look at what "science" they did carry. Here is what we found:



GMO OMG - "Basically a 90 minute home video of Jeremy Seifert on a road trip where he takes every opportunity to make GMOs scary to his (admittedly adorable) kids. I have cute kids too, I can do without being emotionally manipulated by watching his play in a field of GMO corn bizarrely wearing haz-mat suits." - *Dr. Julianna LeMieux*

Fat, Sick & Nearly Dead - "Joe Cross' documentary should be titled "Factless, Slick, and Clearly Misled." I can get better health science from an episode of "Real Housewives of New Jersey." He weighed 320 pounds at age 40 so it's good he turned over a new (lettuce) leaf but the night before he started his "cleanse," he consumed 10 beers, two bottles of wine, a half a bottle of vodka, and "enough Chinese food for half of China" while smoking two packs of cigarettes. Stopping that had a lot more to do with his current health than what he calls "loving your plants." I bet Sissy Flicker knows better too." - *Dr. Josh Bloom*

Sustainable - "The film offers the usual buzz about 'natural, local farming' beating the odds against Big Ag... farmer Marty meets Chef, Chef buys local produce, and everyone feels good about serving natural ingredients... but no one really answers the question, How is Marty going to feed billions around the world?" - *Ana Dolaskie*

Wheat - "Your basic compilation of any and all possible lies, half-truths and myths about how wheat must be the source of all human ills. All you really need to know to understand the fringe nature of this film is that Nobel Laureate Dr. Norm Borlaug, the father of the Green Revolution and the man who prevented more starvation than any other person in history, is dismissed as "working for the corn and wheat board" — whatever that is. The folks who made this movie had too much leisure time and they abused it. Then they abused my time when I watched it." - *Dr. Ruth Kava*

Cowspiracy - "90 minutes about a young man's quest to uncover what scientists, environmentalists and the government don't want you to know - that animal agriculture has a carbon footprint. You know you're on the fringe when even Greenpeace refuses to meet with you. In attempting to create more vegans he steps in a big cow flop - a smart person has to instead conclude that GMOs are the only way to go. Anything else is non-sustainable." - *Dr. Lila Abassi*

Food Matters - "This has to be the worst documentary I've ever seen. It starts with a conspiracy theory -- that doctors don't understand nutrition and only want to cure people with pills -- and goes downhill from there. They claim that the "sickness industry" (medical doctors, conventional farmers, and agricultural companies) makes money by keeping people sick. Heart disease and cancer? Your food is poisoning you. If Fox Mulder made a movie about food, this would be it. You can learn more about actual food and nutrition science by watching Gordon Ramsay shout the F word at his cooks on television." - *Dr. Alex Berezhov*

Forks over Knives - "The plot is simple, plants are more natural and healthy than animals, shot in a style reminiscent of a mid-century documentary, a simpler time with simpler science - you know, when the preparation for a nuclear war was to get under your desk. My favorite factoid was that the Japanese diet of rice and fish reduces prostate cancer. They left out that the same diet resulted in a much higher incidence of stomach cancer, which is far more deadly. Because it invokes the nostalgic feel of 1950s documentaries, it might be interesting for a film enthusiast, but it's useless for those searching for unbiased health and nutrition information." - *Dr. Chuck Dinerstein*



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