



The Wizard and the Prophet: Two Remarkable Scientists and Their Dueling Visions to Shape Tomorrow's World

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From the best-selling, award-winning author of *1491* and *1493*--an incisive portrait of the two little-known twentieth-century scientists, Norman Borlaug and William Vogt, whose diametrically opposed views shaped our ideas about the environment, laying the groundwork for how people in the twenty-first century will choose to live in tomorrow's world.

In forty years, Earth's population will reach ten billion. Can our world support that? What kind of world will it be? Those answering these questions generally fall into two deeply divided groups--Wizards and Prophets, as Charles Mann calls them in this balanced, authoritative, nonpolemical new book. The Prophets, he explains, follow William Vogt, a founding environmentalist who believed that in using more than our planet has to give, our prosperity will lead us to ruin. *Cut back!* was his mantra. *Otherwise everyone will lose!* The Wizards are the heirs of Norman Borlaug, whose research, in effect, wrangled the world in service to our species to produce modern high-yield crops that then saved millions from starvation. *Innovate!* was Borlaug's cry. *Only in that way can everyone win!* Mann delves into these diverging viewpoints to assess the four great challenges humanity faces--food, water, energy, climate change--grounding each in historical context and weighing the options for the future. With our civilization on the line, the author's insightful analysis is an essential addition to the urgent conversation about how our children will fare on an increasingly crowded Earth.

The Wizard and the Prophet: Two Remarkable Scientists and Their Dueling Visions to Shape Tomorrow's World Details

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From Reader Review The Wizard and the Prophet: Two Remarkable Scientists and Their Dueling Visions to Shape Tomorrow's World for online ebook

Philipp says

[Borlaug] asked me if I had ever been to a place where most of the people weren't getting enough to eat. "Not just poor, but actually hungry all the time," he said. I told him that I hadn't been to such a place. "That's the point," he said. "When I was getting started, you couldn't avoid them."

This is Dr. Norman Borlaug, next to Prof. William Erskine (who himself works in an office in my building here in Perth, we co-supervise one PhD student, he's a wonderfully kind man)

(Source for the photo, alternatively, Willie's wall, where it hangs in a frame).

Norman Borlaug worked relentlessly to start the green revolution, for which he won a Nobel Prize in 2005. Norman Borlaug is my idol, and one of my main motivating factors in working in this field.

This is William Vogt:

Sadly I don't have a personally relevant photo there.

Vogt was one of the original thinkers behind the environmental movement, at one point the director of Planned Parenthood, a strong proponent for population control.

This book is, for the first few chapters, a biography of both men. They lived at the same time, looked at the same problems, even met once, but came to different conclusions on how to help people.

Mann takes the lives of both as exemplars for two ways to view the world: Borlaug stands for 'wizards', who believe that for any problem there is a technical solution (notable books are Darwinian Agriculture: How Understanding Evolution Can Improve Agriculture and most silver- and golden-era science-fiction).

Vogt stands for 'prophets', who believe that such technical solutions are ultimately hubris, humanity should go back and live in harmony with nature, work on a small scale, and scale back industry (some notable books in that corner which I all detested: The One-Straw Revolution, Ishmael: An Adventure of the Mind and Spirit - you can see I'm biased to which world-view I come from).

After the biographies come four chapters which look at problems mankind currently faces, climate change, loss of drinkable water, air pollution, food, and the solutions both 'sides' have for each problem. Here Mann

loses me a bit, since he shows these two worldviews as completely opposed - the wizards want to build big desalination plants, the prophets want to get people to stop wasting water and get water-saving plants. I live in Perth which has huge problems with water, yet people have green European-style lawns which do nothing but waste water in a very dry area. I want the best of the wizard and prophet world: I'd love there to be more desalination plants, I'd love for people to abandon green lawns, why can't I have both?

What impresses me is that Mann manages to show the upsides of both sides, where they go well, where they go wrong, it's easy to fall into one side.

What's impressed me the most is that Mann looks at both men's lives, and finds flaws in both ways to view the world. Both (according to Mann) missed the social view, ignored the social scientists' view points. Both usually ignored the structure of power - Vogt, as a representative of the rich West, was often criticised for trying to tell poor people in developing countries to stop developing. If you're poor and have no support from the state, how else are you supposed to have a stable family but by having lots of kids? Borlaug on the other hand would often ignore or not see the political side of his work, and would get frustrated by people pushing back (corruption, fear of change, greed, and especially power imbalances to which Borlaug was often blind). That is to me, the main takeaway of this book - you cannot ignore the social side of your inventions, you cannot ignore the *system* within which your work happens. Progress doesn't magically happen by technology alone.

Nancy Mills says

This is a must-read, in my opinion, for anyone interested in environmental issues, the future of mankind and our effect on the planet. It's an admirably balanced account of two schools of thought, represented by two amazing men who are little known but left huge legacies to our future: Norman Borlaug and William Vogt, the Wizard and the Prophet, respectively.

Vogt introduced the view to a wide audience that our resources are limited, and that the exponential population growth brought about via the Industrial Age will sooner or later strain the Earth's finite resources beyond its capacity. An important pioneer of the environmental movement, he advocated a lighter footprint, limited population (an issue that coincidentally becomes more easily addressed with the advent of birth control; Margaret Sanger and the birth of Planned Parenthood is mentioned in the book), and respect for the natural world.

Borlaug devoted his life to developing more strains of wheat to feed the growing population. During his life, he worked in almost impossible conditions in Mexico and India to deal with a pressing and immediate problem of feeding the hungry.

You can probably see where this is going ... Big Ag vs small farmers; industrial strength fertilizers, etc. etc. While solving the starvation problem in India (not made easy by the post-colonial governments who were keen to industrialize and not particularly welcoming of interference by westerners) it inadvertently put the bulk of the resources into the hands of a few wealthy interests and left the peasant classes with little. To a lesser extent (because we are a richer country and the former farmers can go get other jobs) we can see this has happened here in the US also. We may gripe about Monsanto and its patent seeds and use of Roundup and other toxic chemicals, but at least we are not starving (in fact, we have so much food at least a third of it winds up wasted ... not in the book, just sayin.)

The book has a VERY balanced account of the climate change issue. It's explanation of the effects of carbon dioxide (scientific, not political) are the best I've seen readable and very understandable for the non-scientist, if you are willing to peruse the many pages he devotes to some chemistry lessons. In my opinion, if you are going to debate the issue of atmospheric warming, you MUST know this stuff. Again, although he

analyzed the politics involved in the issue, the author is amazingly unbiased.

Atila Iamarino says

Uma obra fantástica e recomendadíssima em tempos recentes. Charles Mann escreveu livros que gostei muito (1491 e 1493). E neste livro compara duas formas de encarar o mundo e o futuro da humanidade: os profetas, que falam que recursos são finitos e a humanidade precisa parar o quanto antes com o abuso (como Jared Diamond); e os magos, que falam que a tecnologia é a solução de tudo, incluindo os problemas mais recentes (como Matt Ridley).

Ele reconta o surgimento recente dos dois tipos de mentalidade. Com o início do ambientalismo e a noção da agressão que fazemos ao ambiente pré Primavera Silenciosa ao ambientalismo atual. E com o início da revolução verde e a criação da agricultura moderna. Achei o livro muito equilibrado, mostrando a diferença e a influência que cada abordagem teve na humanidade e o papel que podem ter no futuro.

Recomendo demais para quem quer entender de super-população ao aquecimento global, de crises energéticas à transgênicos. Tranquilamente entre os livros mais importantes que li.

David says

Charles Mann has written some wonderful books. I read two of them, 1491: New Revelations of the Americas Before Columbus and 1493: Uncovering the New World Columbus Created, and they are both excellent. And, this book follows in the same vein; while it is about a completely different subject (the twentieth century rise of environmentalism), it is equal in quality to his previous books.

Humans grab between 25% and 40% of the entire world's output of land plants and animals. All other species rise and eventually die out. Are humans special? Is there any evidence that humans might be a magical exception? This is a major theme of the book; are humans headed for extinction, or can some strategy save our species?

This is the story of two opposite visions of how to set right the problems of our environment. The stories are told of two scientists who were early advocates of these two opposing visions. William Vogt held the view that our problems are due to overuse of our environment. Our populations are too big, our land is over-used for farming and left poor in nutrients, and our water supplies are over-used. We pollute the environment, causing all sorts of problems like climate change, and depletion of our natural resources. Vogt's answer was to cut back on consumerism, over-farming, and over-population.

Norman Borlaug saw the same problems, but offered a different solution; technology and human invention can overcome these problems. People need to work smarter, not grow less food for fewer people. It could be said that Borlaug was personally responsible for saving millions of people from starvation.

Vogt was an amateur bird-watcher. In 1933 he observed an over-abundance of black ducks at Jones Beach. The reason was the suburbanization of Long Island, which displaced the ducks. Later, Vogt was hired by a Peruvian guano company to discover why cormorants were decreasing in numbers in the islands off Peru. After Pearl Harbor, Vogt was hired by the U.S. State Department to travel through South America, to report

on the level of support for Germany and Japan. In 1943 he headed the Conservation Section of the Pan American Union. He visited cities in all of the countries in North, Central, and South America. Outside the cities, he discovered environmental nightmares. He found that over-consumption was stripping nature bare. Vogt wrote, "Unless humankind controlled its appetites for procreation and consumption, there can be no peace."

In the early 20th century, ecological issues were seen as a right-wing conspiracy. It was seen as an outcome of a belief in racial superiority. Vogt and others transformed conservation into a liberal cause. He wrote the book *Road to Survival*, which was a big success. The book stated that the problem is an inter-connected world-wide issue, not something merely local or national. The book became a blueprint for today's environmental movement. It helped inspire the writing of the books *Silent Spring* by Rachel Carson and *The Population Bomb* by Paul Erlich.

The Rockefeller Foundation sent Norman Borlaug to Mexico in 1944 to breed disease-resistant wheat in the central highlands. He encountered destitute farmers who had been mistreated by authorities, and kept in the stone ages by superstitions planted by those in power. Here, Borlaug acquired a sense of mission. While Vogt saw the carrying capacity of the land as the central issue, Borlaug saw farmers as being central. To Borlaug, the problem was not the land, but the lack of tools and knowledge.

Borlaug labored for years and years, cross breeding varieties of wheat using an unorthodox method known as shuttle breeding across different climates. His thought was that he did not want to breed a variety of wheat that could be grown in just a single Mexican climate; he wanted a variety that could be grown everywhere in the country. He made many attempts to develop wheat that could resist many types of rust, produce good grain with good milling quality. By 1962 Borlaug had bred an all-purpose wheat that could be grown anywhere in Mexico. It was short, fecund, disease-resistant, and grown in rich or poor soil. The only requirement was that it needed to be watered well and fertilized. His wheat tripled the per-acre yield in Mexico, and then in India and Pakistan. He was awarded the Nobel Peace Prize in 1970.

The book goes on to describe the history of the movement for organic farming, the development of better rice, activism against genetic engineering, enormous water projects in Israel, the problem of carbon dioxide's role in the progression of climate change, pollution due to burning coal, and the green revolution. It is a remarkable book in terms of its depth, and comprehensive history of all of these different aspects of environmentalism, conservation, and the future needs for water, food, and energy. Charles Mann captures the controversies between prophets--who demand reduction in the use of resources--and wizards, who rely on technology to increase the supply of these resources. I recommend this book to everyone who is interested in these issues, and how we came to this point in history.

Peter Tillman says

A pretty good, if overlong, book about technical progress (Wizards) vs. environmental activism (Prophets). More or less. Mann does a good job of remaining even-handed in this long-running debate, which became prominent (in the US) with John Muir vs. Gifford Pinchot in the early 20th century. Mann picked William Vogt as his Prophet poster-boy. I'd never heard of Vogt, an ornithologist who studied the guano islands off Peru in the 1940s, and went on to activism. And I had trouble remembering who were the Wizards. Or Prophets.

I knew a fair bit about Norman Borlaug, the book's Wizard, who won a Nobel Peace Prize as the father of the

Green Revolution. But I didn't know the details of his career, and just how hard it was breeding a dwarf, high-yielding wheat variety that could resist wheat rust, an ubiquitous and destructive fungal disease. Without any formal training in plant breeding, which was just as well, since he was trying unorthodox methods. He got lucky, and the Mexicans (and then the world) got wheat that yielded twice or three times the best previous yields. See first comment for more details of the development and acceptance of the "miracle wheat."

The new wheat varieties finally enabled India (and other countries) to feed themselves. Which was the point of the exercise, as they sure couldn't before. It's a bit hard to imagine that Prophets would criticize this achievement, but some do. There's an evil chain of thought, from Malthus to eugenics to Nazis, that said, let those foreigners die, they breed like rabbits anyway. As Winston Churchill quipped, declining to send food aid to Bengal in 1942. 3,000,000 Bengalis, British subjects all, starved to death.

Mann had a hard time making some of the doom 'n' gloom Prophets' ideas seem reasonable. Not that a lot of them aren't, but it's hard to take people like Jeremy Rifkin or Paul Erlich seriously. Or paving the world's deserts (or Germany!) with solar farms.

The middle part of the book is the weakest, and I skimmed a lot of familiar material on energy use, population growth, and global warming. Mann is careless at time with cites and facts: he repeatedly gives an estimate of a global population of around 10 billion by 2050, but never cites a source. In a brief fact check, there is a range of UN estimates from 8 to 10 billion by 2050 (or, less likely, higher), And the global population may start to decrease about then. Prosperous people have fewer kids.
<https://en.wikipedia.org/wiki/Project...> More on projected population growth at second comment.

His summary of climate-change skepticism (in an appendix) is fair minded. In my opinion, as a geologist who's looked into the topic in some depth, the climate is warming, but pretty slowly, and this is unlikely to cause major problems. I could be wrong.

And there's a sweet, optimistic coda, à la "The Better Angels of our Nature", that says, maybe humans can somehow pull this off, give everybody a decent life without totally trashing our planet. I certainly hope so, and, though we may disagree on the details, I expect you do, too.

Koen Kop says

A must-read for anyone who cares about this planet and the pursuit of happiness of all its inhabitants. Best book I've read in ages.

Dave says

I really didn't think I'd ever waste my time reading another new book by Charles Mann. After he came out with his article claiming that fossil fuel supplies are infinite, I lost all respect for him. I had actually liked 1491 and 1493, finding some ideas to be a bit questionable but for the most part being pretty good books. At first I couldn't even believe that the article could have been written by the same guy who wrote those. Looking around for more solid evidence of his insanity, I found an interview on youtube with him and John Tierney that was just shockingly irresponsible. I mean, it's one thing to say that peak oil "doomers" are

putting too much faith in the economy crashing on its own before making the planet uninhabitable (an opinion I actually agree with) but to use high oil estimates as justification for infinite growth is completely nuts! Not only do these guys mock anyone who thinks we should conserve resources, Mann also blatantly misrepresents Jared Diamond's ideas. This made me really question his sincerity. He just comes across as a con artist trying to eliminate competition from his niche. Since that interview I have actually seen a video of him and Diamond talking together pretty cordially though. Maybe the things he said that originally irritated me were just honest mistakes but I do find that kind of hard to believe.

I only heard about this book because people were passing around Mann's newest Atlantic article about the challenges of feeding a world with 10 billion people. Sustainable agriculture is a subject I've been interested in for a while. I've also been interested in the debate between anti-tech groups and pro-tech groups about which path really is best for people and the planet, having even written my own book on the subject (it was never actually published so technically it's just a "blog" but it was written to be read like a book. If anyone's interested they can read that here for free <http://aproposalforprimitivism.blogspot...>). Since it focuses on some of my favorite subjects, this book was kind of hard for me to resist. I figured that even if I disagreed with his ideas I should at least see what he's saying since so many people follow his work.

Even before getting to the book, his Atlantic article had some really bad mistakes. Most annoying to me, since I've spent so much time researching the ideas myself, was a line about chestnuts producing more calories per acre than wheat. I have absolutely no idea where he came up with that. It's pretty common for people to calculate the yield from nut trees in fresh weight and the calories per pound in dry weight (this actually threw off some of my own estimates in the first draft of my work before I realized the mistake) but even using those numbers, the highest reasonable estimate for chestnut yield per acre is 6,000 pounds per year (this is about 6 times higher than the number that should be used for calories per acre calculations by the way). When you multiply that by the calories per pound, that's still less than the average wheat yield, and wheat isn't even the highest yielding of annuals anyway. The only explanation I can think of is that he took the number of trees initially planted per acre and multiplied that by the average yield of a full grown tree instead of using the number of full grown trees that can fit in an acre, which can be less than 10% of the number of trees initially planted. I am an advocate for perennializing farmland so it's not the glorification of tree crops over annuals that annoys me, it's the impression this leaves people with about how many people can be fed with sustainable agriculture and how that shapes peoples' opinions on economic growth. This particular mistake isn't found in the book but I think it says a lot about the credibility of Mann's research.

Getting into the actual book, there are a lot of dumbed down, overly simplified arguments and misrepresentations of different groups of people. It didn't piss me off as much as I'd expected though. He does a pretty good job of hiding his own opinions, presenting most ideas as the opinions of others, which helps him come across as a little less biased towards infinite growth and techno-utopianism. Make no mistake though, he does have his own opinions and is trying to leave readers with a certain impression. I'm extremely skeptical of the claim that he's undecided or still trying to figure out which side he's on. Early on he says that he used to lean more towards the "Vogtian" side but came to sympathize more with "Borlaugians" as he realized oil wasn't running out and pesticides weren't leading to epidemics of cancer (his words, not mine). The choice to focus on Vogt and Borlaug as the progenitors of two opposing views of thought is itself pretty strange. It feels more like a pointless gimmick to me, basically just some new way of presenting ideas that most of his readers already know anyway, like climate science, the evidence for evolution, how photosynthesis works and the history of Darwinism. He spends way too much time explaining these things in my opinion. Almost every topic of discussion just turns into an excuse to write a short biography on some scientist. I thought the point of the book was supposed to be comparing high tech visions of the future with lower tech alternatives, not rehashing what thousands of other environmental books have already said.

It seems like a bit of a stretch to say that most people can trace their opinions back to one of these two schools of thought. I really don't think these particular scientists influenced us as much as he claims. His terms "Vogtian" and "Borlaugian", or prophet and wizard, don't even cover the full spectrum between simplicity advocates and techno-utopians. And this isn't just because there are more complex mixtures of opinions on growth/degrowth, centralization/decentralization, global/local, unified/diverse, and large-scale/small-scale than just small-scale low-tech advocates that want degrowth and large-scale high-tech advocates who want infinite growth (compare anarcho-primitivists who want a world of a few million hunter gatherers to simple living advocates who think we could feed over 10 billion with low-consumption localized lifestyles and permaculture to conservative libertarians who are against the science of evolution and global warming but still want to use science to colonize outer space to the zeitgeist movement that wants a techno-utopian world government for the sake of protecting nature to singularitarians who want maximum technological progress so we can escape the limits of nature, etc.). The two main options presented in here are actually both pretty pro-tech and pro-complex global industrial civilization, probably being best summarized by their views on how solar panels should be arranged rather than their views on whether or not solar panels should be part of the solution at all. Vogtians want solar panels on their houses and Borlaugians want huge centralized solar power plants. That doesn't exactly cover everyone. Similarly, the main argument shouldn't be about which view will best provide for 10 billion affluent humans but whether or not we should even try to create a world of 10 billion humans with American middle-class lifestyles. This question isn't totally left out, to be fair, but he doesn't spend anywhere near as much time on simpler alternatives. Being someone of the opinion that high-tech lifestyles will never be truly sustainable, I was pretty disappointed by that.

He's also way too kind to those who question whether or not it's our responsibility to make any sacrifices for the sake of future generations. Many fears of energy shortages and climate disasters have proven to be exaggerated, right? So why should rich people risk losing any of their privileges (what a horrible atrocity that would be!) if we aren't 100% sure that the sacrifices will lead to a better future? I have absolutely no respect for this shit at all. When else are such arguments ever acceptable? It's like robbing someone and saying "so what? Maybe you'll meet the love of your life while standing in line at the local soup kitchen, someone you'd have never met if you were still financially stable. Your life may be better because I robbed you." Or how about "yeah, I murdered your 12 year old son but for all we know he could have grown up to be the next Hitler. If you can't prove otherwise then I shouldn't be punished." It's especially irritating coming from someone who loves to use statistics about the greater good to justify things, like how a smaller percentage of people are dying violently these days than at any other time in history and that most of us are living longer lives, etc. Most of his other arguments are about playing the odds, at least the way he sees them, but with this it's about letting people take huge risks to the wellbeing of the majority if there's even just a slim chance of them not leading to disaster. If he was following the same logic with this subject, that people have to play the odds for the sake of the greater good, shouldn't he be as skeptical about the promises that technology will fix everything as he is of the claims that technology is leading us to disaster? Techno-optimists have been claiming for centuries that we're headed for a world of leisure, one without war, starvation, disease, crime, depression, obligatory labor or anything else bad, all because technology will fix everything. Have those predictions been more accurate than the pessimistic ones warning us of potential ecocide? Every technological advancement has just led to new problems and most serious environmental studies keep finding that things are falling apart even faster than predicted. But because the most extreme predictions about a coming ice age or sudden economic collapse have been debunked you don't take any warnings seriously? It's crazy! We're not talking about a slight problem that has a slight chance of occurring if we don't all voluntarily suffer horribly for the sake of the future. We're talking about a very likely possibility of making the only habitable planet we know of totally uninhabitable unless we make ourselves a little less comfortable for a little while. In a lot of cases, people will likely end up finding that these "sacrifices" actually improve their lives. Humans aren't exactly designed to stare at computer screens all day. I know that

there are more obstacles to changing our lifestyles than just getting people comfortable with the idea. Even those who want to change already feel like they're trapped in the status quo. To keep going along with this though should feel unbearable for anyone who sees where it's headed. Even the damage that's already being done to nature and to less fortunate humans should be considered unacceptable to anyone with a conscience.

Reading his work, you have to wonder sometimes if Mann really cares about the environment at all. It almost seems like he's just trying to attract environmentally-minded people to read his books so he can trick them into joining the techno-optimist side. At times I wondered if that might be backwards though. He does mention some good solutions like agroforestry and indigenous land management techniques after all. Could he be trying to get techno-optimists to accept some of the ideas of the simple living crowd instead? It's really hard to tell. More likely he's just trying to double the size of his audience so he can sell more books. In my opinion, this guy's good ideas aren't enough to make up for the bad ones. I definitely don't recommend supporting him. If for some reason you do want to read his work then you should probably just borrow the book from the library or something rather than buy it.

Leo says

3/5: Great review of two mainstream, competing environmental resource management theories, those involved in the culmination of these two theories, and a brief history of their interaction with our environment.

Hadrian says

Dual biography which compares and contrasts two main currents of thought in the environmentalist movement.

"The Wizard" is the Iowan scientist Norman Borlaug, who believed that scientific advancement would solve problems of food scarcity. He is best remembered as a champion of the "Green Revolution", which led to increasing crop yields in South Asia and other parts of the developing world. "The Prophet" is the ornithologist William Vogt, who first studied the question of guano production in South America, and concluded that human population growth would lead to the exhaustion of natural resources. In his 1948 book, "The Road to Survival", he warned against the dangers of overpopulation and overconsumption, and warned of the worst case scenarios of Malthusian food shortages and resource shortfalls.

After two brief and admiring biographies, Mann moves to how these two separate perspectives would approach major environmental issues - this is in four chapters named after the Greek classical elements. Earth's population would probably reach 10 billion by 2050, and they would all need food and water. Electrification and fuel use are a major point of contention - Prophets would say we need to reduce use, Wizards would find more efficient means of production. Both would agree on the basic facts of human-caused climate change, the difference is in what to do about it.

Mann has written an accessible and insightful book. What impressed me even more than his subject matter is his even-handed treatment of two groups of loggerheads. He even includes two appendices full of scientific papers and books for supporting arguments.

Mark says

Superb history of the modern environmental controversy from the standpoint of progenitors. William Vogt and Norman Borlaug, ideological enemies, between them set the ground rules for today's animosity between two worldviews that, for all intents and purposes, should be working together. Unfortunately, personality and sense of mission can form deep barriers to reason and Mann gives us a historical biography of where and how this divide emerged---between Wizards, those who believe in scientific and technological solutions to make the world provide more for a growing population, and Prophets, those who see catastrophe just ahead and believe the only solutions are in cutting back, doing less, leaving Nature alone. There are fundamental incompatibilities between these views, but there also seem to be more than ample grounds for fruitful cooperation.

Mann is an excellent journalist, a terrific writer, and has produced a work steeped in human sensibility with no absence of technical understanding. He lays out the problems with care and reveals history that has been too long hidden beneath the myths of recent hype. Highly recommended.

Stephanie Moran says

Food for thought book. Well researched and referenced. Enjoyable but intense read.

Charles Mann claims this is about two remarkable scientists, William Vogt and Norman Borlaug, but I would claim that his book revolves around three remarkable scientists, the third being Lynn Margulis. Mann uses Margulis's biological rules and explains Vogt and Borlaug's work and perceptions against them.

Mann starts the book by give us biographies on both men and touching on their early and most important works. Basically, Vogt is more of naturalist and Borlaug gets the ball rolling on modern agriculture (it's implied he starts the GMO wave, but from what is described he created hybrids - by hand) He then breaks their theories down into the four elements: Earth, Water, Fire, and Air. He thoroughly explains the position of things from both points of view. He then finishes up the book with recapping on the later years of both men. The book finishes with two appendixes – on why to believe that climate change is happening and the GMOs are safe for consumption (to me the GMO issue isn't so much that they are safe for consumption but the environmental, moral, and financial impacts – Mann doesn't really touch on these).

There were some shortcomings to the book that prevented me from giving this a five star rating. This is because Mann conveniently left out some discussion points on topics – perhaps because they were too dicey? Also, he doesn't always analyze what he is presenting - leaving this up to the reader.

After reading about the two men, I discovered I am a pretty much a Vogtian with a splash of Borlaugian.

Ryan B says

How will humanity chose to address the future ecological problems it will face? Weaving together

biography, philosophy, and science, the author presents an unbiased perspective on the two possible paths we can take to meet the challenges of supporting 10 billion people by 2050.

Here are some interesting points I took away from the book.

1. Human beings are subject to the same ecological and biological constraints as all species. For example, the principle of the sigmoid growth curve states that any population growing exponentially (including humans) starts off slowly, goes through a rapid growth phase, and then levels off as it approaches the “carrying capacity.”

The carrying capacity is determined by food availability, competing species, and environmental hazards. As Thomas Malthus first formally identified, population growth tends to outstrip food supply and the destiny of most species is ultimately extinction.

This raises some interesting questions for humans, such as what our own carrying capacity might be (the human population is expected to reach 10 billion by 2050). Clearly, there are limits, even if we’re not sure what those might be.

2. Once you understand the concept of carrying capacity, it becomes clear that there are two ways of addressing the problem. One is to limit population growth or resource utilization. The second is to increase the availability of resources, for example by using science to increase crop yield.

If you believe the answer is in cutting back and conservation, you’re following the legacy of William Vogt and the Prophets. If you believe prosperity, affluence, and science is the answer, you’re following the legacy of Norman Borlaug and the Wizards.

3. There are no simple answers. While science and technology can increase food production and energy capacity, there are costs. Humans are driving and have driven several species to extinction, are artificially warming the planet, acidifying the oceans, damaging the ozone, and altering entire ecosystems.

Likewise, while conservation and environmental protection programs are valuable, in themselves they don’t produce enough food or energy to support the growing population. Without economic growth, innovation suffers and cannot solve ecological problems as they arise. It also seems contrary to human nature to want less rather than more.

These are difficult problems, and I appreciate that the author, having researched the material for years, didn’t pretend he had all the answers. That makes this book a great lesson in humility and journalistic integrity in addition to a brilliant and detailed examination of the issues.

Dave says

For me, Charles Mann has another home run with 'The Wizard and the Profit', 5+ stars! Mann is also the author of (among other books) '1491' and '1493', extraordinary nonfiction/history works. He is on my short list of very fine historians/nonfiction authors.

In this book, Mann tells the story of the lives and works of two largely forgotten but extremely influential mid-twentieth century scientists. In 1948, William Vogt (the 'Phophet') wrote 'Road to Survival'. A hugely

influential book, it foresaw the planet's and man's doom if we continued to populate (over-populate) the earth and ravage its resources unchecked. He espoused among other things population control and severe conservation. Norman Borlaug (the 'Wizard') won the Nobel Peace Prize in 1970 as the father of the "Green Revolution". Borlaug saw hunger and he tried to overcome it through plant breeding and science. Essentially, the two men perceived the same problem (the land's human carrying capacity was being exceeded) and attempted to solve it in opposite directions.

Charles Mann uses the story of these two passionate, brilliant, and hard-working men to address our dilemma as a species and inhabitants of earth. We will approach 10 billion strong in this century. Are we headed for catastrophe or are we capable of solving approaching major problems (hunger, climate change, resource depletion, etc.)? This is a wonderfully written, even-handed, thoughtful, calm examination of our most important questions.

Highly recommended!

Charles says

This book addresses what is, as far as the material comforts of the modern age, the central question of our time—can mankind have it all? The author, Charles Mann, does not answer that question, though I think his answer would be, if forced, “probably yes.” What Mann offers, rather than canned answers, is a refreshingly and relentlessly non-ideological work, comparing two philosophies of human development, embodied in the lives of two men of the twentieth century. The first, Norman Borlaug, engineered the saving of hundreds of millions of lives and won a Nobel Prize. The second, William Vogt, prophesied a global doom whose arrival date has been continuously postponed for fifty years, and then shot himself, whereupon he was forgotten until this book.

Mann carefully profiles each man in detail. He characterizes Vogt's school of crying out the gospel of limitations as Prophet, and Borlaug's call for pushing past natural boundaries through hard work and ingenuity as Wizard, clever enough names for clear enough positions. Vogt, born in 1902 and died in 1968, was an abrasive man who found it difficult to keep jobs or friends, whose abiding passion was amateur ornithology, but who rose to prominence on the basis of a wildly successful 1948 book, "Road to Survival" (a copy of which I bought in preparation for this review). Borlaug, born in 1914 and died in 2009, was an agronomist with a smoother touch and much less interest in a public role. He wrote no books, but he bred plants, specifically new versions of wheat that multiplied the global harvest, essentially eliminating famine (because of Borlaug, all modern famines are purely the creation of political malefactors, most notably the Ethiopian famines of the 1980s). The Green Revolution that has fed the world for the past fifty years was inaugurated and, in many ways, led by Borlaug.

Vogt receives the first focus of the book. Mann expertly describes his life (Mann writes excellently; this book is long, but it reads like a short book), including his formative experience, being hired by the Peruvian government to analyze the ecology of the guano islands that provided natural fertilizer to much of the world, before the Haber-Bosch process made artificial nitrogen fertilizer economically feasible. The guano, of course, was provided by birds, which had boom-and-bust population cycles, based on their food supply. Vogt's conclusion, after extensive study, was that any interference by humans with the natural cycle was ruinous; in the short term, production might be increased, but eventually natural limits of one sort or another would be reached, leading to total and permanent collapse—thus, the Peruvians should not interfere with the natural cycle of intermittent partial collapse.

Shortly afterward, a new publisher offered to publish a book by him (how and why this came about is not

made clear), which was wildly successful. *Road to Survival*'s basic claim was that, like the guano birds, only worse because of his abilities to manipulate nature, man was exceeding, or was going to exceed, the "carrying capacity" of Earth, which would lead to his destruction and that of the ecology of the Earth as a whole. Vogt's book was glowingly reviewed (other than by the Left, which condemned it as a distraction—prior to mid-century, proto-environmentalism was a cause mostly of rich cranks, and the Left was still focused on labor), sold 800,000 copies through the Book-of-the-Month Club alone, was translated into numerous languages, and used for decades as a college textbook. And it had a massive impact on the thought of others—for example, both Rachel Carson ("Silent Spring") and Paul Ehrlich ("The Population Bomb") explicitly cited Vogt's book as the inspiration for theirs. Whatever the flaws of his book, Vogt was undoubtedly the father of modern environmentalism (which Mann insightfully calls "the twentieth century's only successful, long-lasting ideology"). Vogt developed its patterns of thought, its focuses, and its obsessions. He exemplified static analysis of the globe—there is only so much to go around, and in such a zero-sum game, if we do not cut back our usage of finite resources, the inevitable result will be collapse, no different than fruit flies in a test tube given a limited supply of food.

That said, "Road to Survival" is also a book that has been proven totally wrong in every regard (just like "The Population Bomb," and, mostly, "Silent Spring"). Reading it now is painful because Vogt was so, so wrong. (It's also painful because of its simpering Introduction by Bernard Baruch, a man who, like a bad penny, keeps turning up, usually in the darker corners of history, making them darker.) Sure, as I discuss below, maybe in the long run Vogt will be right in part. But "long run" arguments are inherently weak—it's the same as arguing that Communism has never really been tried, so we should try again, just as soon as we finish bulldozing the bodies from the last attempt into a trench. More likely Communism is just wrong. And aside from the crashing inaccuracy of its predictions, Vogt's book is equally painful for its shrill, hectoring tone and for its earnest demands for handing over global power to a new class of technocrats who will solve the problem—a million little Vogts, using their immense new power only for good, of course, we are assured. In 1948, perhaps, such ideas could be excused, but now, we know how they always end. We can see that Vogt was an ideologue from whose pages a voice can be heard, as Whittaker Chambers said of Rand's "Atlas Shrugged," "To a gas chamber—go!"

Leaving aside the fascism of his approach, if there was a core principle of Vogt's, it was that, in his words, "mankind is a part of the earth's biological system and is not a form of genii that can successfully provide substitutes for the processes of nature." Along these lines, Mann profiles at some length, and keeps returning to, his own friend, the late Lynn Margulis, a well-known biologist, whose interpretation of evolution "is that *Homo sapiens* is just one creature among many . . . a briefly successful species," which will pass from the scene like all others. But this is a very narrow vision, because humans are the only creatures with intelligence and the ability to think about the future. We may, in fact, pass from the scene, but if we do, it will be in a manner different in its essence from that of other past species, to which humans are only comparable on the most simplistic level. You'd think the Prophets like Vogt would agree with this—after all, they claim that man has unique abilities to exceed the earth's carrying capacity, unlike animals like the guano birds, who stay within their limits due to natural processes they cannot change. Why the converse, that man also has unique abilities to avoid these limits, by either self-discipline or technology, does not follow to these people is unclear. Maybe it is because they are ideologically unable to regard humans as anything but animals.

Borlaug, on the other hand, was the father of modern techno-optimism, sometimes called "cornucopianism"—most visible in the Green Revolution he fathered and led, but more than that, a belief that with human ingenuity and intelligence, through hard work and technology what we may have in many areas is not static. But it is up to us to ensure that there is enough for all. Born of Norwegian stock in far rural Iowa, he saw extreme hardship in the Depression, including fights over food, which affected him deeply. He wanted to be a forester, but was unable to, so he became an agronomist. He took a job funded by the

Rockefeller Foundation, working in the desperately poor central Mexican lowlands to develop wheat that was resistant to stem rust, one of the most problematic North American wheat diseases.

The wheat he had to work with wasn't what we think of when we think of wheat—not only was it extremely prone to diseases, rust among them, it was inherently low-yielding, and also prone to other problems, such as “lodging” (where weak stems bent under ripening grain—wheat then was “the height of a tall man,” and much of the plant's energy went to the stalk). Moreover, each locality had to plant a different wheat. All these problems had existed for millennia. Like Vogt, Borlaug's reaction on seeing the poverty and lassitude of the local farmers was “We've got to do something.” But that “something” wasn't to tell the farmers to suck it up and have fewer children. Instead, Borlaug hand planted hundreds of thousands of different wheat plants, every single plant hand-pollinated, with the cross painstakingly recorded. He did this in both his original Mexican location and in others, against the wishes of his superiors, with whom he was often on contentious terms. Bulling his way forward and often pulling a plow by harnessing himself, he spent years trying to find plants that not only resisted rust, but had other desirable characteristics. And he got lucky (though as they say, luck is where preparation meets opportunity), finally finding and propagating a handful of ideal varieties that could be successfully planted not just everywhere in Mexico, but all around the world—whereupon he evangelized successfully for their acceptance in places like Pakistan and Uganda. It is on his work that modern agriculture, which has fed the world as it has grown, is based.

So far, the distinction between Wizard and Prophet is clear. But, if you think a little, there are really two threads among Prophets. One is the warning that we will run out if we overuse resources, and so we must find the best way to maximize utility to benefit humans. This is the minority view, and shades into Wizardry, in that maximizing utility implies openness to new solutions, rather than just management of what exists now. The other Prophet view, by far the majority, and Vogt's view, is that we are damaging our world, and that damaging is bad in and of itself, totally aside from its impact on utility. The goal is to satisfy the supposed claims of Gaia, not to help humans. These are really separate philosophies, ones that Mann does not adequately distinguish. The former is a practical claim; the latter, a moral claim.

What follows is that most Prophets are fundamentally anti-human; and essentially all Wizards are profoundly pro-human. Soon enough an objective observer realizes that most Prophets' goal isn't achieving a balance between humanity and nature, it's eliminating humanity itself, which they wish would just go away (other than themselves, their friends, and favored groups), so that the abstraction of “Earth” can flourish in its own way. Thus, to nobody's surprise, or at least not to mine, Vogt quickly turned from espousing limitations to advocating extermination. His second act was to become a shill for Margaret Sanger's infamous racist and eugenicist organization, Planned Parenthood. As Mann says, Vogt changed from being an environmental advocate who thought population control would benefit the environment, to a population control advocate to whom the environment was secondary. “The means had become the end.” (In fact, the title for Vogt's “New York Times” obituary was “William Vogt, Former Director of Planned Parenthood, Is Dead,” giving primacy of place to that part of his life, not his environmentalism.) He wrote, in 1960, an even shriller book, *People! Challenge to Survival* (which I also bought), an unhinged rant demanding ultra-aggressive global population suppression, where the “People” of the title are the causes of the challenge, and it is not clear whose survival is at stake, but probably not people's. This is the sort of evil tripe common among Prophets to this day, which they reveal in their less-guarded moments. About a decade ago, there was a vogue of such wishful death-focused thinking in the popular media, led by the book *The World Without Us*, which described in loving detail what would happen if all the humans just conveniently disappeared. It was actually quite interesting, and followed by various related TV specials and similar media events, but the reader and viewer was quite aware that this was, for many environmentalists, aspiration, not explanation.

On the more practical level of policy, we live in a time when Wizards and Prophets are roughly evenly

matched in mindshare of the public, but the Wizards are firmly in control of actual policy, certainly of agricultural policy. It is hard for us to remember that not so long ago, Prophets were the only game in town. All right-thinking people of 1970, in a way that we cannot comprehend today, wholly bought into “The Limits of Growth,” in the Club of Rome’s infamous phrase, and as Mann notes, for much of his life Borlaug was the target of coordinated vicious abuse by the powerful and famous. But the failure of their prophecies gradually led to the loss of part of Prophets’ policy power, even if they are still given platforms by various outlets. It is not coincidental that Prophet hysteria reached its peak just at the time that the movement for legalized abortion also reached its peak. The public frenzy over supposedly direly needed “limits” to humanity dictated much of the thinking of the Supreme Court in the high water mark of the pro-abortion movement, the handing down of *Roe v. Wade*. In fact, recently Ruth Bader Ginsburg (who was not part of the Court in 1973) noted with approval that *Roe v. Wade* invented a constitutional right to abortion out of whole cloth in part because of “concern about population growth and particularly growth in populations that we don’t want to have too many of.” The age of Prophets may have crested, but we’re still left picking up the pieces, and many of their acolytes still occupy positions of power, still hewing to that old time religion of doom and hatred of humanity.

In any case, Mann does not make any of these distinctions, but after discussing Vogt and Borlaug, he turns to offering a further lengthy (and fascinating) history revolving around their ideas, focusing in turn on four different areas where Wizards and Prophets have contended over the past seventy years: food, water, energy, and climate change. Here Mann fills in many large and small details relevant to both Vogt’s and Borlaug’s lives, such as the invention and rise of artificial fertilizers, the early twentieth-century organic movement, the science of soil and humus, and the process of photosynthesis and its susceptibility to engineering. The latter involves today the C4 Rice Project, a massive ongoing attempt to “change the biophysical structure of the rice plant, making it a much more efficient user of energy from the sun,” funded by the Gates Foundation with any positive results to be given away free. On water, Mann focuses on the difference between Wizard projects to desalinate and move massive quantities of water, and Prophet projects to reduce the need for water. (It is sometimes easy to see a little bit too much of James C. Scott’s “high modernism” in Wizard projects, as Scott narrates in *Seeing Like A State*, but not all grand projects suffer from the defects Scott identifies in his examples of deficient grand plans. It is all in making sure the premises are based in reality and that the execution stays cognizant of human nature.) On energy, Mann notes that predictions of imminent “peak oil” have been urgently made for, and have been decisively falsified for, more than a century. He criticizes these predictions not only for being wrong, but for being the driver of many bad policies, from our own desperate focus on controlling flow from the Middle East to endless wars in Africa.

The premise, or thought experiment, or waking dream, that drives Mann’s book is the idea that by 2050, there will be 10 billion people on earth, all reaching toward affluence. For current purposes, we can accept that, but really, there is much to suggest the dream is mere fantasy. Affluence is not something that automatically arises; it is driven by culture, by age demographics, and by many other factors. There is no reason to believe that the entire world will develop to “Western affluence,” with consequent further stretching of resource needs, and much reason to believe it will not, whatever people lacking that affluence may want. Furthermore, those societies that have created and still drive that affluence are dying due to failure to reproduce, and most other global societies are following closely in their insane footsteps. That will not only prevent ever becoming affluent, but put even more of a damper on development and progress, which is driven almost exclusively by the young. China will be old before it becomes rich, and its problems are only the most prominent example of the catastrophic damage caused by the population control programs pushed by people like Vogt and his long-time ally, the odious Julian Huxley, though none of their advocates have ever apologized, since the Left never does.

But let’s assume that Mann is correct—we will soon enough have 10 billion people, and they will all have a

much higher standard of living than the current global mean. The truth is that, so far, the Wizards have always been right that the future can be managed, and the Prophets always totally wrong. The Prophets preach on, though, for a variety of reasons, ranging from financial gain to the pleasure of power over others to the search for personal transcendence. Still, as has been said, all apocalypses are falsified, except the last. So the Prophets may yet be proved right, if not on resource availability (Mann quotes an expert who says, for example, the best answer to “when will we run out of oil” is “never”), but on some of the consequences of our actions, specifically with respect to global warming. This is the final topic Mann discusses at length, handling it expertly in order to make sure a discussion can be had that does not drive away either the skeptics or the alarmists. In essence, he asks skeptics to assume, for the purposes of discussion, that anthropogenic global warming exists and is a problem, and he later offers an Appendix outlining evidence for that position.

However, even if that is true, it does not mean that the Prophets are right in their solutions to climate change—after all, the position of a Prophet consists not only in prediction of the future, but in the embedded assumption that nothing can be done other than restrict human activity. A Wizard can, and often does, agree with the specific prophecy, and with its likely accuracy if nothing is done—but his solution is different (and that is why the pro-human Prophets usually shade into Wizardry). That is the real difference between Wizards and Prophets. And it is the real difference here as well—many Wizards think that global warming has a technological fix, just like every other problem mankind has faced. This may be false optimism—under certain scenarios, global warming could result in extreme consequences that cannot be countered (although that is always a possibility, elevated to a near certainty, in Prophet scenarios, isn’t it?). But coordinated political action is in practice impossible. If anthropogenic warming is real and a real problem, its solution is therefore likely to be a Wizard solution, not a Prophet solution.

[Review continues as first comment.]

Kyle Muntz says

A really nice look at issues of the environment and sustainability, very well written and weirdly evocative in its organization: the dueling ideology of “wizards and prophets” in their struggle to manipulate the elements of “earth, water, fire and air”. On the other hand, despite its successes, I can't help but be a little disappointed, as this is the only book by Mann that hasn't drastically inverted the way I understand something. The issues are more familiar here, though he finds very interesting points to explore and I definitely still learned things. There's also, by the end of the book, a disconnect between the biography and the science, which made me less eager to finish reading about Vogt and Borlaug when the issues had already been covered. Mann is definitely one of my favorite nonfiction writers, though I'd suggest starting with his first two books for something more surprising. In some ways, the looks at certain related subjects in 1493 were actually more insightful than the ones he gave here, even as this book sort of rounds out some underlying concerns in that book and explores them much more fully. Importantly (and uniquely, considering the subject matter), Mann avoids taking a position on most of the important issues, which I really appreciate and is part of what distinguishes him as a writer.
