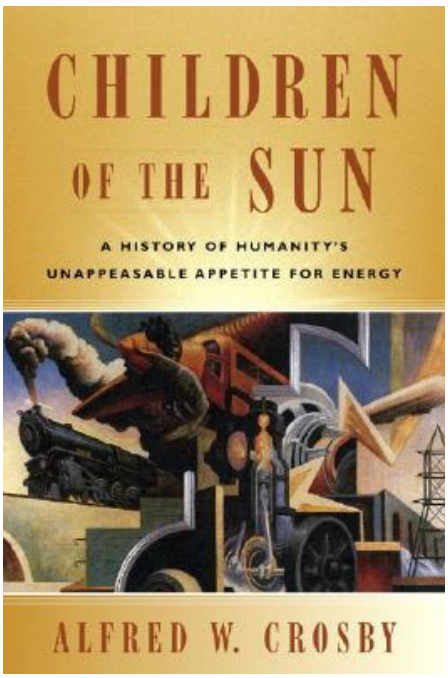

Children of the Sun: A History of Humanity's Unappeasable Appetite for Energy

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Children of the Sun: A History of Humanity's Unappeasable Appetite for Energy Alfred W. Crosby We don't often recognize the humble activity of cooking for the revolutionary cultural adaptation that it is. But when the hearth fires started burning in the Paleolithic, humankind broadened the exploitation of food and initiated an avalanche of change. And we don't often associate cooking with drilling for oil, but both are innovations that allow us to tap the sun energy accumulated in organic matter. Alfred W. Crosby, a founder of the field of global history, reveals how humanity's successes hinge directly on effective uses of sun energy. But dwindling natural resources, global warming, and environmental pollution all testify to the limits of our fossil-fuel civilization. Although we haven't yet adopted a feasible alternative—just look at the embarrassment of "cold fusion" or the 2003 blackout that humbled North America—our ingenuity and adaptability as a species give us hope.

Children of the Sun: A History of Humanity's Unappeasable Appetite for Energy Details

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From Reader Review Children of the Sun: A History of Humanity's Unappeasable Appetite for Energy for online ebook

Gisselle says

a good intro to energy history

María Dabrowski says

Thought-provoking, science-based, thorough. Explains how human's drive for energy has informed how we create societies and motivate our research. Scary, really, but a good read.

Peter says

Good overview of the various sources of energy humans have tapped throughout history. I enjoyed the discussion of our evolutionary history in the first couple chapters as well. The author includes balanced discussion of each source of energy and suggests ways we might better utilize them going forward through the next few decades. The concept of "energy returned on energy invested" demonstrates the diminishing value of fossil fuels as they become more difficult to obtain. Not to mention the constantly increasing pollution that negatively affects all life forms, arguably human life most of all. Looking forward we can make machines more efficient, begin refining oil from tar sands, expand natural gas usage, and safely operate nuclear reactors, but it seems the ultimate solution that will last for centuries is developing fusion. This is a ways off but with added investment and research, it would be marvelous development in our human history. The thought of safe and unlimited power with no emissions has to excite anyone who wants to maintain the lifestyle we have become so accustomed to over the last couple centuries.

Ruth-fiam says

Nice book

Scott says

This book is certainly worth reading. This provides an overview of history from a unique perspective.

Grant says

A brief but thought provoking view of human history seen through the lens of humanity's use of energy.

Crosby identifies the taming of fire, the development of agriculture, and the use of fossil fuels as three "sprints" in the development of our ability to harness the sun's energy for our own purposes.

David Nichols says

This eighth book by innovative historian Alfred Crosby is a qualitative study of human beings' increasing consumption of energy since the Pleistocene. Crosby's unifying theme in this ambitious narrative is indicated by his title: humans' primary source of energy has always been solar power, which supports the food chains upon which we and our domestic animals feed, moves the winds and waters that provide us with some of our electricity, and which, millions of years ago, produced the hydrocarbons that power most of the modern world's vehicles and power plants. Our exploitation of solar power began with advances in food production, namely the domestication of fire for cooking (which increased the digestibility of raw foods) and the development of agriculture. It accelerated when Europeans began using hydrocarbons - “fossilized” solar energy – for motive power, first employing coal to drive steam engines and activate the industrial revolution, then in the late 19th century learning to refine oil and use it to power compact internal combustion engines. The growth in energy output made possible dramatic increases in humans' collective standard of living, but also made human beings dependent on a finite resource: the world can produce ample food and has plenty of coal, but oil supplies are limited and exhaustible. Crosby un-usefully dismisses the notion that we could “cobble together a variety of environmentally friendly sources of energy” (126) to replace coal and oil, arguing this is unrealistically complex and Puritanical, and proposes instead mass conversion to nuclear power. This is a hard sell to make in the aftermath of the 2011 Fukushima disaster, and even before then fission power had two huge problems: waste disposal, and the overwhelming cost of building new reactors. (Crosby closes with a chapter on nuclear fusion, a nice narrative touch given his theme, but a pipe dream at present.) In the end, Crosby is wedded to the idea that a big, worldwide, government-sponsored conversion to nuclear power is the only thing that can provide for our growing energy needs, but in fact the United States' current “all of the above” energy strategy (conservation, solar, wind, biofuels, hydrocarbons) is more compatible with our decentralized modern society, and unlike nuclear power is likelier to stimulate human ingenuity and technological breakthroughs.

Alison Swearingen says

This was a thoroughly engaging take on the history of our dependence on the sun - from hunter/gatherers to nuclear scientists. All the claims were supported wth evidence and the codas following each chapter were thought provoking. More scientific than socially based, but that is more my style and I really enjoyed reading this book and learning more about how our energy sources have changed and will continue to change.

Richard Reese says

All life requires energy to survive, and our primary source of energy is the sun, a fireball of nuclear fusion. On Earth, the plant people absorb this energy and convert it into simple carbohydrates. Humans and other animals extract these nutrients from edible plants, and/or from the flesh of plant eating animals.

Alfred Crosby’s book, *Children of the Sun*, presents a history of how humans access energy. It’s a good companion to his earlier book, Throwing Fire, a history of projectile use, spanning from thrown stones to

nuclear weapons. Both discuss the rapid acceleration of innovation, population, and ecological impacts. This growing instability over the centuries is largely off the radar in our day-to-day lives. Most of our brain cycles are engaged in the here and now, a pushbutton wonderland of nonstop magic.

Crosby reminds readers of the obvious fact that fossil energy is finite, and the large, high quality deposits are approaching their finish lines. We are making little effort to wrap our heads around the notion that our high-impact energy-guzzling lifestyle has an expiration date. Instead, we pretend — with all our might — that the here and now is perfectly "normal," and everything is excellent.

When the spirits of our wild ancestors observe today's "normal" they see a nightmarish insane asylum. Powerful historians like Crosby can vaporize the walls of our madhouse, and allow us to perceive the hundreds of centuries of turbulent cultural evolution that preceded our birth. We can observe the spirit of progress transition from an occasional draft, to a strong wind, and the full-scale hurricane of today.

In the 200,000 years since the first Homo sapiens punched in at the time clock, almost all generations have been wild nomadic hunter-gatherers, living in a manner that was far simpler, and much closer to sustainable. For almost the entire human saga, this slower, gentler mode was the long term "normal." But it wasn't normal.

Some scholars have speculated that if space aliens had visited 100,000 years ago, humans would have appeared to be ordinary animals of no significance. Wrong! We were roasting steaks with domesticated fire, a spooky trick never performed by ordinary animals. Fire was domesticated prior to Homo sapiens, maybe 500,000 years ago, maybe a million, nobody knows.

When our ancestors burned biomass like wood, they were utilizing the solar energy stored by the tree. Fire provided some benefits. It intimidated hungry predators. It enabled our ancestors to survive in regions outside the tropics. It made cooking possible, a huge advance. Cooking partially predigests foods, making it easier for our guts to extract more nutrients from them. It also transforms a number of inedible substances into edible sources of nutrition. Chimps spend six hours a day chewing raw foods. Of course, progress is never free — fire making eventually led to huge unintended consequences, like megafauna extinctions, industrial civilization, the population explosion, and an unstable climate.

It's fun to play "what if…" What if that first fire starter, who learned how to make sparks with friction, had been ripped to shreds by hyenas prior to his or her discovery? Without fire, furless hominids could not have survived in chilly non-tropical regions. The snow monkeys of Japan solved this challenge by evolving heavy winter coats. Would Homo sapiens have ever evolved at all, limited to a raw food diet? Would the Americas and Europe of today still be human-free wildernesses, home to healthy populations of mammoths, bison, and sabertooth cats?

Over time, our ancestors got better at hunting and basic survival. When some groups moved out of the tropics, they encountered conditions for which evolution had not fine-tuned them. They needed tighter shelters, warm clothing, and food storage for the lean seasons. Clever innovations could increase the odds for survival, and the cleverer we got, the better. Over the millennia, our addiction to innovation snowballed. Like an arms race, the groups possessing the most powerful juju were likely to displace or erase the bubbas with inferior juju.

And so, the clever ones spread around the globe. Growing numbers eventually ran out of uninhabited lands to colonize, leading to growing friction. Too much cleverness eventually led to what Ronald Wright called "the perfection of hunting." By killing megafauna a bit faster than they could recover over the centuries, big

game gradually got scarce. Our menu shifted toward small game, and then to aquatic edibles.

The domestication of plants and animals was another Earth-shaking innovation. We could now exploit solar energy more efficiently. More people could live on less land. Never before had we controlled so much energy. Population grew, spurring instability. The enslavement of animals like horses and oxen provided us with pack animals to carry stuff, and traction animals to pull stuff. No longer was the work in human communities performed solely by human muscle power. Enslaved animals could be exploited in many ways.

By A.D. 1000, clever ones had learned how to capture more energy with waterwheels, windmills, and sailing ships, but muscle power was still the primary energy. We were drifting toward the limits of utilizing solar energy via agriculture and burning wood. As forests disappeared, the clever ones began burning coal. Eventually, mineshafts reached the water table, and muscle powered gizmos were unable to remove the water fast enough. So, brilliant lads invented steam engines that could pump water and keep the mines dry.

Until maybe 1700, human society ran primarily on the muscle power of humans and animals. The steam engine, like the domestication of plants, animals, and fire, was a major advance with horrendous unintended consequences. The speed of innovation became a constantly accelerating whirlwind — locomotives, steamships, and multiple-spindle spinning machines. Lighting switched from the flickering hearth fire, to candles, then whale oil lamps, then coal gas, then kerosene, then electric lights.

Steam engines were pushed to the sidelines by internal combustion engines, which were used to power automobiles, tractors, trucks, locomotives, ships, and many other machines. Gasoline couldn't run a sewing machine 100 miles away, but electricity could. We invented generators, installed power grids, built hydroelectric dams, and nuclear power plants. We invented telegraphs, telephones, radio, television. The herd grew explosively from one billion to two, three, four, five, six, seven… Zoom, zoom, zoom…

For a while, the Peak Oil doomsters made us nervous, with their predictions that the production of conventional oil would likely peak around 2005, which it did. But we got distracted by the growing production unconventional oil from oil shale (fracking) and tar sands, and returned to pretending that we have no limits. Let's go shopping!

Thankfully, Crosby provides readers with an embarrassing birds-and-bees talk about EROEI (Energy Returned on Energy Invested). In the 1930s, the EROEI of oil production was 100:1 — it took one unit of energy to extract 100 units from the underground reserves. When he was writing in 2006, it had dropped to 17:1. Today, it's less. Low EROEI means that lots of oil will be left in the ground forever, regardless of how high the price eventually rises. Imagine having a job that paid $100 per day, but the bridge toll to get there was $105.

Crosby offers us no silver bullet solutions. "Winning streaks are rarely permanent." The easiest approach to our challenges is to continue living foolishly and hope for miracles. The smartest response would be sanity — limit population, cut consumption, live lightly, and abandon nuclear and fossil energy. "We have every reason to believe that we are capable of environmental sanity; but first we have to accept that the way we live now is new, abnormal, and unsustainable."

It's a short book, and very easy to read — no charts, graphs, or techno-jargon. Crosby describes the uncomfortable facts of life in a calm and non-hysterical way. I have zero complaints about it. It's an excellent intro to energy. He briefly discusses the limitations of alternative energy sources. The limits are more thoroughly discussed in Renewable Energy Cannot Sustain a Consumer Society. The huge downside of nuclear energy is better addressed in Too Hot to Touch. Other energy-related books include Snake Oil,

Cadillac Desert, The Big Flatline, The End of Growth, Techno-Fix, and Afterburn.

Pontus Wendle Ekholm says

I love books that takes a step back and explains world history with broad strokes, and only dives into the nitty gritty when it's truly necessary, and this book does just that. Changes in energy consumption has resulted in massive changes to our world, both good and bad, and this book goes into some of those changes one might not know. The introduction of the potato in Europe changed things almost as much as gasoline, and this book explains why.

Lauren says

This book is a great overview of multiple aspects of human energy consumption. The science is so accessibly explained that I could recommend this book to someone without a strong background in the natural sciences. The statistics are used to actually contextualize the science and history, rather than "sounding big" to emphasize some point. I learned a lot from this book and recommend it to anyone who wants to understand the effects of technology on energy consumption and human history.

Lori says

If you've never thought about where we get all our energy from this is a good introduction. Unlike most authors, Crosby starts at the beginning (before fire) . Not much new here for me and no great thoughts to nake me think. This would be good starting point for a high scool or college seminar.

D.L. Morrese says

Until recently, all the energy humans ever used was, ultimately, solar. Muscles got their energy from food. The bottom of the food chain rested on plants, which got their energy from the sun. When humans tamed fire, they burned wood...a plant. Peat, coal, natural gas, and oil are also derived from plants. They are forms of stored solar energy compressed and compacted over many millennia. Electricity was, and still is, generated mainly from burning coal, gas, and oil. Hydroelectric plants produce some, but they rely on the planetary water cycle, which is driven by evaporation and precipitation powered by the sun.
This book is a brief account of humanity's still growing quest for usable energy. It offers no real recommendation for where that will be found, other than a cautious nod toward nuclear power and especially the hope of fusion at some point in the future. It does not, however, foresee the delay to the ITER (International Thermonuclear Experimental Reactor) and seems to place more hope on it than perhaps is warranted given the delays, cost increases, and political uncertainty surrounding it. It also doesn't foresee advances in the efficiency of solar voltaic cells or their declining cost, and seems to dismiss their potential too quickly. Although this was published in 2006, it already feels a bit dated. Perhaps this is simply another example of how quickly things change in our age.

Jenny Wehinger says

Another great ELM book! Very interesting.

Riley Haas says

This is a brief but informative and fascinating history of human use of energy. It is so brief that it's hard not to recommend it because my experience with "big history" books of this ilk is that they are normally gigantic, with a forbidding page count that turns most people off. So, because I get into it, I should just say: this is easy to read, it's short and you should read it.

There are essentially two parts to Crosby's summary: the first is the story of human use of energy up until the 20th century; the second is a brief examination of the possibilities for humanity in the 21st century and the future. The former is better and more worth your time than the latter, but I am also not really the person to evaluate the latter.

I have never really thought about how we used energy in the past. In nearly every history book I've ever read prior to this one, energy consumption has either been entirely absent from the discussion or a footnote. But, much like geography and other external factors, energy availability has had more of an influence on human behaviour than most of us imagine and certainly every "great men" history of the world has ever bothered to acknowledge. This history is brief, yes, but it feels pretty thorough. It does make me want to dig deeper into some of these changes, from wood to coal, and other similar leaps. Also, it is yet another reminder that I am extremely happy that I was born in 1981, and not 1481 or even 1881. It is impossible for us living in the developed world in the 21st century to truly understand how little energy humans had access to prior to electrification.

The end of the book deals more with present problems. It isn't necessarily less effective - though I don't know how scientifically rigorous it is - but, because it is no longer history, it is fraught with issues, one of which is that this book is now 13 years old or so, and one has to assume these chapters are scientifically out of date. Moreover, it's really hard to know how complete Crosby's survey of fusion and other potential energy sources truly is. That being said, it's interesting and feels informed. It does leave me wanting a lot more, though.

The main reason to read this book - and you should read it - is the history of our usage of energy, and how that history utterly flips our notions of how human history has been driven, and how unique our current situation currently is in the history of the earth. It's extremely eye-opening but it is so brief that you can get through this is a week or something with no problem. I'm not sure I've read so impactful a book that was so short.

Really worth your time.
