

Hydrogen Today



Show Me the Hydrogen



Inside H2 Today

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At the December AHA meeting, Howard Phillips, described two new processes for generating any amount of hydrogen you want. First method: Almost any form of carbon can be catalyzed to become Catalytic Carbon (CC). Then the CC can be heated with scrap aluminum (powdered or granulated) and water to produce hydrogen. Second Method: Burned paper and aluminum can form carbonized aluminum. The carbonized aluminum becomes Catalyzed Aluminum after being activated by the Phillips Company's patent-pending process. Simply adding the CA to warm water begins the production of hydrogen. In both methods, the reaction works with sea water or dirty water. The byproduct is aluminum hydroxide, a common and useful industrial product. The nonprofit Phillips Company is now licensing the technology. They will be demonstrating 30 gallons per minute production at their plant in Millerton, OK on January 21, 2013. Call 623-594-9195 for information.

<http://www.phillipscompany.4t.com/CA.pdf>
<http://www.phillipscompany.4t.com/REG.pdf>

Catalytic Carbon works with any scrap aluminum you have.
 Available from: <http://www.catalyzedcarbon.com> 480-319-7467

"Quotations"

"Education is the most powerful weapon which you can use to change the world." Nelson Mandela

"Hydrogen -- Star Gas, Everywhere, Yet Unseen. Sunlight is its Child" Haiku by Stephen Wetlesen

'We Deliver Clean Air'

American Hydrogen Association Mission

Hydrogen Today:
Journal of the American
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** SAFETY FIRST **

Develop and prove solar hydrogen technologies that will eliminate economic, environmental and energy hardships caused by burning one million years accumulation of fossil fuels every year *and*

Educate scientists, entrepreneurs and experimenters, parents and educators, CEO's, legislators, utilities, the media and farmers how to use solar hydrogen to create sustainable prosperity without pollution.

Here's the Deal

By Roy McAlister
President of the American Hydrogen Association

CIVILIZATION'S GRAND PURPOSE

Throughout history, civilization has thrived when a purpose was established and faltered in the absence of serving a purpose. But our sense of purpose is now diminished by the distraction of pollution and an emerging awareness that the Industrial Revolution cannot be sustained on fossil fuels. We are trapped by dependency on the tremendous productivity of fossil fuels. Depletion of fossil fuels and pollution of the atmosphere, clean water and the oceans seriously threaten our standard of living. Consider some facts:

- Fossil fuels are only 0.1% efficient. (photosynthesis 0.6%) x (conversion to petroleum 50%) x (conversion to electricity 40%) x (delivery efficiency 85%) = 0.1% Much more efficient existing renewable energy technology can replace burning fossil fuels.
- Present food production requires 10 calories of fossil fuel to produce, package and deliver 1 calorie of food. Six pounds of topsoil are transported into oceans by wind and water erosion for every pound of food grown.

True wealth is measured in matters of well being, the natural environment and the environment we make for ourselves. A worthy Grand Purpose is to devote our depleting fossil economy to evolve the Industrial Revolution into the Renewable Energy Revolution. We can operate our cars trucks and airplanes on hydrogen and clean the air as we travel. Using hydrogen will create a market for hydrogen extracted from sewage, garbage and farm wastes while reducing greenhouse gases.

It is by countless miracles during the billions of years before humans appeared on earth that we have a benevolent environment. We must dedicate ourselves to developing a sustainable relationship with our environment.

The Grand Purpose of civilization is to achieve *sustainable prosperity without pollution*. To safely reach this destiny, we must develop awareness, expectation of satisfaction and dedication to the development of appropriate renewable energy supplies to replace fossil fuels.

Hydrogen on the Internet

FCS (Fuel Cell Ship) Alsterwasser plies Hamburg's waterways.

<http://www.greenoptimistic.com/2012/10/24/fcs-alsterwasser-the-first-ship-powered-by-hydrogen-fuel-cells/>

MQ-8 Hydrogen sensor for Arduino. Available on eBay for \$11.90, shipped directly from China.

http://netdrive.envell.com/pic/ebay/SEN-000003/SEN-000003_Datasheet.pdf

Emefcy fuel cell turns microbes and waste water into electricity.

<http://www.scientificamerican.com/article.cfm?id=microbial-fuel-cell-treats-wastewater-harvests-energy>

Or make your own Mudwatt Microbial Fuel Cell. \$59.95 from Edmund Scientific.

<http://www.scientificsonline.com/mudwatt-kit.html>

The AAA in Arizona is offering roadside electric vehicle recharging.

<http://www.az.aaa.com/news/automotive/aaa-unveils-new-electric-vehicle-offerings>

Hybrid Jaguar XJe gets 112 MPG.

<http://theenergycollective.com/namarchetti/141361/staggering-112-mpg-jaguar-if-it-s-hybrid-yes>

Open Source 100 MPG car plans and parts available online. This needs to run on hydrogen.

<http://main.wikispeed.softlaunch.352media.com/>



The "HyAlpha" 396cc hydrogen-powered rickshaw in India does run on hydrogen, 80km/kg.

<http://www.thehindubusinessline.com/companies/article2787739.ece>

Toyota fuel cell buses will provide electricity in disaster areas.

<http://www.fuelcelltoday.com/news-events/news-archive/2012/august/toyota%E2%80%99s-power-supply-system-allows-fuel-cell-buses-to-be-used-for-disaster-management>

Editorial

I have informally volunteered and donated most of my life, following the example of my father. But when I was elected to the AHA Board, it was a whole new world of nonprofit governance, fundraising, bookkeeping, SOX, Robert's Rules and IRS rules. Fortunately, it was easy to find help, starting with the public library. Every week there are webinars on using Facebook, making videos or how to pump up the Board. Local nonprofit associations offer workshops in grant writing and event organizing. Arizona State University has a weekly nonprofit newsletter besides degrees in nonprofit management. Techsoup offers nonprofit corporations discounted donated software, for example Microsoft Office Pro Plus for \$35.

There are some friends who can't comprehend what motivates someone to work for free. Well, it makes you feel wonderful. Does your paid job do that?

Hydrogen Events

The Phoenix American Hydrogen Association now meets the second Thursday of every month from 6 to 8pm at Denny's restaurant, 650 N. Scottsdale Rd. in Tempe, AZ (SW Scottsdale Rd/202, one mile north of ASU light rail station). Call 480-964-0458 or 480-229-0828 for details.

The Silicon Valley AHA chapter meets every third Saturday at the Peninsula Conservation Center, 3921 East Bayshore Road, Palo Alto, CA from 10am to noon. Meetings are now online. Contact Pres. John Gotthold at 408-245-6065 or jgotthold@comcast.net He'll need your email to send you the link before the meetings. Their website is www.ahasvc.org

(Zing) Hydrogen and Fuel Cells Conference 2013, 12-15 July 2013, Napa Valley, CA (\$1300) Five themes- Hydrogen Production, Hydrogen Storage, Fuel Cell R&D, Hydrogen Applications and Hydrogen Safety. <http://www.zingconferences.com/index.cfm?page=conference&intConferenceID=109>

Get your passport for:

9th International Hydrogen & Fuel Cell Expo, 27 Feb.-1 Mar., Tokyo, Japan (¥5000) Full range of seminars and 150 exhibitors. <http://www.fcexpo.jp/en/Home>

Hydrogen + Fuel Cells 2013, 16-19 June, 2013, Vancouver, Canada (\$1025, \$375 for students) Theme is "Power, Transportation & Energy Storage." <http://www.hfc2013.com>

5th International Conference on Hydrogen Safety (ICHHS 2013) 9-11 September 2013, Brussels, Belgium. With the coming of fuel cell cars, hydrogen is moving out of labs and factories into the hands of the public. Users will need to be educated on hydrogen safety. Some of the themes are hydrogen infrastructure, codes, accidents review, safe storage, risk management and fuel cell safety. <http://www.ichs2013.com>

5th World Hydrogen Technologies Conference, 25-28 September, 2013, Shanghai, China (\$600) Theme is "Hydrogen Cooling the Earth." <http://www.whct2013.com>

Books & Publications

Hydrogen Safety, Rigas & Amyotto, 2012
CRC Press, \$132, 274 pages.

Hydrogen has some unique properties that make it both fascinating and dangerous to the uninformed. Hydrogen is tasteless, invisible and odorless. The odorants added to propane and natural gas will contaminate the catalysts in hydrogen fuel cells. Injuries and damage may come from flames, cryogenic burns, explosive blasts, asphyxiation and embrittlement. The charts and case studies show the age-old problem of complacency. Besides hydrogen properties, the book thoroughly covers storage, vehicular use, safety management, areas needing further research and codes of practice. Hopefully you'll never need to know that 482.6 kPa of overpressure is immediately fatal. For all that the book covers, it's only a beginning, but it's an excellent beginning. No book can replace experience. The price may be enough to severely injure your pocket book, but compare it to the cost of a fire or explosion.

Lives Per Gallon: The True Cost of Our Oil Addiction, Terry Tamminen, 2006
Island Press, \$23.52, 262 pages.

Recently I rented a cargo truck and the attendant told me it got 13 miles per gallon. Maybe I should have asked him how many lives per gallon it got. As a former government regulator, the author likes his numbers, but the numbers aren't boring. These numbers hurt.

- Children living within ¼ mile of a freeway have an 89% higher risk of developing asthma than children living a mile away.
- Diesel exhaust causes 100,000 cases of cancer in the U.S. each year.
- The food plants we eat absorb 225 varieties of toxic substances from burning petroleum.
- California offshore oil drilling rigs have had 123 major blowouts since 1960, one as large as three million gallons.
- One drop of oil can be tasted in 14 gallons of water
- A Shell refinery in Norco, Louisiana accidentally released 1,316,556 pounds of toxic air pollutants. They were fined \$15,000.
- Only 5% of automobile fuel actually moves the passengers.
- For every \$1 corporations invest in campaign contributions, they get a return of \$1000.
- Burning gasoline in the U.S. produces 1.1 billion metric tons of CO₂ per year.

He explains how the oil and auto industries lied and lobbied to protect their own short-term and short-sighted ends. He wrote two scenarios for the year 2025. In the first, there is civil unrest and war. Fuel-less vehicles litter the streets as gasoline prices double every 24 months. Social Security is bankrupt. In the second, Americans are driving US-made hydrogen vehicles. China and India skip the gasoline stage and go directly to hydrogen and biofuel transportation. Oil tankers now carry water and nobody cares that they still leak. Tamminen asks where we would be if the \$100 billion spent on the Iraq war had been spent instead on an alternative energy industry and infrastructure.

He has some answers for energy independence. He gives two pages of easy ways to cut your gasoline consumption by 20%. He devotes twenty pages to the pros and cons of hydrogen.

So how many lives per gallon? Tamminen doesn't say. It's something you can think about the next time you fill up.

Screw Business as Usual, Richard Branson, 2011
Penguin, \$26.95, 372 pages

This probably isn't what you'd expect from one of the world's most successful and flashiest businessman. It's a book about partnering with the poor, listening to them and creating jobs. He sees problems as business opportunities. The poorest may only earn \$2 or \$3 dollars a day, but that's a multi-billion dollar market. Everybody wants to better themselves and their families. Selling a \$300 sewing machine in Africa provides employment for six women. The book is full of stories about how businesses are doing well by doing good. Interspersed are his own stories about how he evolved from a dyslexic student into a philanthropist. His role has been to create teams of thinkers, doers, celebrities, billionaires and world leaders like Nelson Mandela and Jimmy Carter who collaborate on real solutions for drug abuse, AIDS, malaria, TB, preventable blindness and homelessness. Within days, Branson was getting 747 relief flights with donated medical supplies and volunteer doctors into Haiti and Japan. If he keeps it up, he'll have every human being on earth working together. Do good, make money and have fun.

Smelling Land: The Hydrogen Defense Against Climate Catastrophe, David Sanborne Scott, 2007
Canadian Hydrogen Association, \$28.95, 485 pages.

The good news is, we're never going to run out of fossil fuels. The bad news is environmental catastrophes will kill everybody long before we burn that final barrel of petroleum. The title comes from the legend of a cabin boy who had the audacity to warn a British admiral he could smell land through the fog – just before the fleet ran aground on the Scilly Islands in 1707 with a loss of 2000 lives. Scott's book is loosely connected chapters on various energy themes. Instead of a detailed history, he picks examples of how we moved from the horse age to the steam age to the petroleum and electricity age and how we can transition into the hydrogen age. This is not supposed to be a complete plan. You'll find yourself delighted over and over with new ways of looking at energy.

Cooking with the Sun: How to Build and Use Solar Cookers, Dan & Beth Halacy, 1992
Morning Sun Press, \$22, 114 pages.

This classic has plans for a parabolic cooker and a box oven for those with basic carpentry skills. They explain how to use them and give some recipes to get you started. Solar cookers perform best from about 10 am to 4 pm. The fuel is free.

Tales from the Sustainable Underground: A Wild Journey with People Who Care More About the Planet than the Law, Stephen Hren, 2011
New Society Publishers, \$17.95, 189 pages

In spite of the title, you won't find many latter-day Thoreau's or patriotic guerilla heroes standing up for principles. There are people in Detroit squatting in abandoned buildings and growing food in vacant lots. They care more about surviving than the law. Some artists express themselves by building houses and couldn't care less about codes. I'm sure there are times when it's more pragmatic to operate in the grey instead of getting the law changed, like when you sell a gallon of biodiesel without the required and very expensive meter. But do you want to run a business uninsured, unable to advertise and under constant stress of being found out? Do you want to be forced to take down your unpermitted photovoltaic system?

One scofflaw who lied to a building inspector was given three choices – evacuate RIGHT NOW, do \$200,000 worth of repairs or pay \$35,000 *a day* in fines. Is there a point to subsisting on roadkill and dumpster fare when cities like Mesa lease acreage to community gardens for \$1 a year? Hren ungraciously has some unflattering opinions about the people he's interviewed. His own forays into the underground include a yurt that collapsed in a blizzard and a marijuana garden that the sheriff harvested. The bottom line is, does what you're doing bother the neighbors?

Oxygen Hacker's Companion, Vance Harlow, 2009
Airspeed Press, 156 pages.

The Oxygen Hacker's Companion is written for divers, pilots and emergency people, but there is a tremendous amount of information for anyone handling compressed gas. He covers compressed gas physics, cylinder regulations, filters, purging, cylinder inspection & care and valve, hose & fittings hardware. He shows how to build a simple % of oxygen meter from an automotive O2 sensor and a digital voltmeter.

Harlow mentions some of the hassles of dealing with gas suppliers. Some will refuse to fill a tank that is not theirs to try and force you to buy one of theirs. I've been accused of being a thief when I tried to fill a tank that had been donated to the AHA. The worst hassle was two diving friends who drowned when compressor oil coated their lungs. We never found out where they filled their tanks.

Most of us producing hydrogen by electrolysis just vent the oxygen to atmosphere. Instead of wasting all that electricity, we should find a use for the O2, such as oxy-hydrogen welding.

Hilda Hydro: An Alternative Fuel Adventure, Ann Hoffmann, 2007
Wild Horses Publishing, \$6.95, 194 pages, ISBN 978-0-615-16298-0

This parable is about two young sisters who decided to drive a souped-up hydrogen fueled Ranchero from Phoenix to a family reunion in upstate New York. Through their many adventures we learn about renewable energy and that teenage ladies can accomplish whatever they set their minds to. After you read it, give it to a teen or donate it to your library. Available from the AHA. See the last newsletter page.

Thanks

Kathy- \$3000 donation.

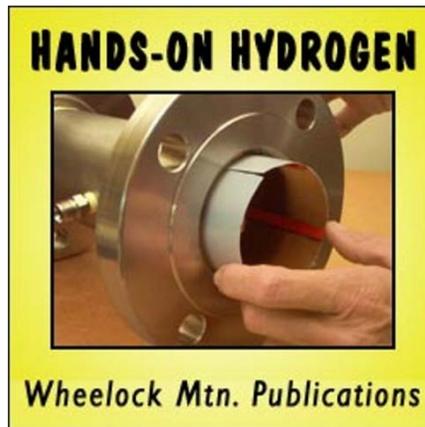
Byron- Website archives.

Russ- Website coding.

Steve W- Permission to use poetry.

Steve B- Wikispeed link.

Howard- Catalytic Carbon presentation at December meeting.



Ebooks for Do-It-Yourself Experimenters

By Phillip Hurley

- Build Your Own Fuel Cells....\$14.95
- Build A Solar Hydrogen Fuel Cell System....\$16.95
- Practical Hydrogen Systems: An Experimenter's Guide....\$16.95
- Build Your Own Solar Panel....\$12.95
- Solar II....\$12.95
- Solar Hydrogen Chronicles....\$12.95
- Solar Supercapacitor Applications....\$16.95
- The Battery Builder's Guide....\$16.95

<http://www.goodideacreative.com/wheelockmtn.html>

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1,3,5-trimethylbenzene
1,3-butadiene
1 butene
2,2,4-trimethylpentane
2-methyl-1-butene
2-methyl-2-butene
4-methyl-2-pentene
acetaldehyde
acetone
acetylene
acrolein
aldehyde
benzene
benzo(a)pyrene
carbon dioxide
carbon monoxide
cymene
ethane
ethyl benzene
formaldehyde
formic acid
hydrogen
hydrogen sulfide
isobutene
isobutylene
isopentane
isoprene
methacrolein
methane
NOx
particulates
propadiene
propane
propionaldehyde
propyne
pyrene
tert-butyl-alcohol
tert-butylformate
tolulene
water
xylene

THE HYDROGEN CENTURY

Imagine a world where the poisonous black ooze of oil
no longer fouls the seas, the feathers of birds,
the lakes, the streams and the waters,
gasoline fumes no longer choke the air
as the cacophony of clanking engines no longer deafens the ears,
the black soot of dinosaur age coal
no longer darkens the skies for thousands of miles
and the invisible death of global warming
from fossil fuels
no longer ravages the earth
from the magnificent glaciers of both poles
to the unspeakably bright artistic colors of tropical coral reefs.

Imagine a world where the clean primeval substance
that makes up the substance of most of the whole visible universe
is quietly, peacefully
generated by the gentle sun,
the undulating waves
and the symphonic winds
to power any imaginable level of human civilization,
sustainably,
in a just global economy for all,
without ugly, noxious pollutants,
respecting our planet
and all living things
while protecting them.

This bold vision begins
when we
simply
give it a name
to fire our
consciousness
and that is why we call
the entire
twenty-first century

The Hydrogen Century.

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Mr. Wetlesen writes custom poetry for special events. Contact him at 408-252-8655 or

SCWetlesen@aol.com

AHA Membership Form

Name _____

Address _____

City _____ State ____ Zip _____ Country _____

Telephone _____ email _____

- Regular Membership- \$39.00/year (New members receive a free copy of Roy McAlister's "Solar Hydrogen Civilization").
- Student & Senior (60 and over) Membership- \$25.00/year
- Sustaining Membership- \$100.00/year (autographed book and H2 bookmark)
- Life Membership- \$1000
- Corporation/Institutional Membership- \$1000/year
- "Solar Hydrogen Civilization" book only - \$24.95 postpaid.
- Email *Hydrogen Today* only
- Send AHA New Chapter Packet
- "Hilda Hydro - Girls Go Green" - \$6.95 postpaid

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Or email payment to: americanhydrogenassociation@gmail.com through www.PayPal.com

Join the AHA and use our services to learn how every community can achieve sustainable
Prosperity Without Pollution.

AHA publishes *Hydrogen Today* to help educate the public about new developments in renewable energy and the science and people behind them. Join us in making a better world. You can help too by writing for *Hydrogen Today*. Tell others about your grassroots alternative energy projects, either scientific or social. Review a book, product, service or event. A picture is still worth a thousand words. The range should be approximately 300-1000 words. Send to the above address or to the *Hydrogen Today* editor at bikesintl@netzero.com.