

Betsy says HI!!!!

Announcements

The next LABQUEST meeting will be this Wednesday, July 10 at 12:30 in the GSA trailer.

Science Report Highlights

Betsy and Dan thought all the items in following science report from Charles were interesting but most liked the following:

- Energy Drinks Damage Tooth Enamel
- FDA Approved New Treatment for Alzheimer's Disease (AD)
- Oral Covid-19 Vaccine *Pill* Under Development
- FDA Outlaws BVO in Foods
- Linkage Between Gut Inflammation and Alzheimer's Disease
- Brain Clears Metabolic Waste When Cued by Slow Electrical Waves During Deep Sleep
- **US Treasury Department and IRS Final Rule on Wages for Clean Energy Projects**
- Shopping Centers Near Transit Stations Boosts Both

Science Report

Self-Protective Measures -

You should get your medical advice from official sources, your doctor, or your pharmacist ... not from this Report or the internet. Per recommendations by FDA and CDC, everyone should maintain current vaccinations for the three respiratory viruses: Covid, flu and RSV (for RSV, adults [over 60](#) and children [younger than 8 months](#)) - unless your doctor advises against it based on your medical record. Adults over 50 should have had the [Shingrix vaccine for shingles](#) (two doses 2 to 6 months apart, good indefinitely).

- [Energy Drinks Damage Tooth Enamel](#) - because the combination of sugar and acid erodes the surface The erosion is magnified if drinking is stretched out in time - rather than quick, followed by a rinse. [Publication](#). Energy drinks are also unhealthy for other reasons. [Julian G.]
- [CDC Advice on Fungal Diseases](#) - See the different types of fungi, and the diseases associated with them, [here](#). Note the increased risk of fungal infections during hospital stays, and in long term care facilities, due to the presence of those with weakened immune systems.
- [CDC Report on Fourth Human Case of Bird Flu Related to Dairy Cattle](#) - [here](#).
- [NIH BMI Calculator](#) - Use the [NIH](#) National Heart, Lung and Blood Institute [calculator](#) to find your Body Mass Index (BMI). Above 25 - overweight. Above 30, check with your doctor, consider better nutrition, and exercise.

Vaccine and Therapeutic News -

- [FDA Approved New Treatment for Alzheimer's Disease \(AD\)](#) - FDA has approved [Eli Lilly's](#) monoclonal antibody treatment [Kisunla](#) (donanemab-azbt) for the treatment of early stage AD. The treatment achieved a [modest decrease in the rate of cognitive decline](#), by 35% over 18

months, but is *not* a cure. The cause of AD is not yet known, but this treatment achieves its limited result by progressively reducing the concentration of amyloid plaque in the brain, as measured by a succession of 5 positron emission tomography (PET) scans. Note the potentially serious side effects. [Details](#).

- [Oral Covid-19 Vaccine Pill Under Development](#) - The present *injectable* mRNA Covid vaccines are very delicate. They must be transported and stored at ultra-cold temperatures. An oral pill would ease transport, storage, and administration of the vaccine, and reduce costs. The US Biomedical Advanced Research and Development Authority (BARDA) in the US Department of Health and Human Services has awarded up to \$453 million in funding to [Vaxart](#) (South San Francisco CA) for conducting a [Phase 2b human study comparing the company's pill form of the vaccine to one of the mRNA vaccines](#). Enrollment startup in Summer, 2024. [Steve H.]
- [Bird Flu Vaccine](#) - The US Biomedical Advanced Research and Development Authority ([BARDA](#)) in DHHS has awarded [Moderna a \\$176 million contract](#) to develop a bird flu vaccine. Bird flu is now said to be widespread among dairy cattle, and has infected a number of dairy workers. Human to human transmission has not yet been reported, but the situation is concerning. Wise move by BARDA. [Moderna](#) (Cambridge MA) [Steve H.]
- [Hepatitis C Test at Point of Care With Real Time Results](#) - [FDA](#) has cleared [Cepheid](#) (Sunnyvale CA) to market the 'Xpert HCV test and GeneXpert Xpress System', enabling a test-and-treat approach that is expected to result in the treatment of many more patients. Between 2.4 and 4 million people in the US are estimated to be infected with Hepatitis C, many being unaware of it. If left untreated Hepatitis C can lead to liver cancer and liver failure - 12,000 deaths in 2022.
- [Chronic Inflammatory Demyelinating Polyneuropathy \(CIDP\)](#) - FDA has [approved](#) Vyvgart Hytrulo ([efgartigimod alfa and hyaluronidase](#)) for the treatment of CIDP - previously approved for generalized myasthenia gravis. CIDP is a rare inflammatory, peripheral nerve disorder resulting in progressive weakening of the arms and legs, numbness and tingling, impaired balance, and difficulty walking. [Peter and Elsa P.]

Other Health Science News -

- [FDA Outlaws BVO in Foods](#) - **Final Rule revoking authorization for the use of brominated vegetable oil (BVO) in foods**, [here](#). This has already been done in both the UK and the EU. See the Agency's consumer announcement, [here](#). History and [details](#). BVO is most commonly used as a stabilizer (avoids separation) in fruit flavored, carbonated drinks and sports drinks, especially citrus. See a product list to avoid [here](#). **Throw out now** anything in your cupboard or fridge that lists [BVO on the contents label](#). FDA has *much* more work to do on additives, particularly red dye #3, propylparaben, and potassium bromate (all already banned in CA).
- [Can Bacteriophages Be Used Against Antibiotic Resistant Bacterial Infections](#) - See a description of the possibilities and procedural barriers [here](#). [Steve H.]
- [Linkage Between Gut Inflammation and Alzheimer's Disease](#) - Read a lay description of new findings [here](#).
- [Brain Clears Metabolic Waste When Cued by Slow Electrical Waves During Deep Sleep](#) - The brain makes a lot of waste, including amyloid, that must be cleared to avoid cognitive decline, dementia, and diseases such as Alzheimer's. A series of new studies (mouse studies) shows, for the first time, how this previously mysterious process is accomplished - proven by curing mice of cognitive decline using 40 Hz bursts of sound and light to stimulate the brain's neurons to generate the electrical waves (gamma

waves) that start the clearing process. **Human trials ASAP!** Clear lay description [here](#). Publication [here](#).

- [Eli Lilly Is Using AI to Investigate Treatments for Drug Resistant Diseases - Details](#). [Steve H.]
- [10 Ways to Stretch Your Lower Back](#) - see a physical therapist's [advice](#) on stretches you can do at home to prevent or relieve lower back discomfort for extended sitting. Sharp pains should be referred to your doctor. Doing stretches in a sauna could make them more effective.
- [Are Your Stools Healthy?](#) - Check the Bristol Stool Chart [here](#). Ideally you should be a Type 3 or 4. This simple check, that you can routinely do yourself in a few seconds, may help catch a problem early, and could provide important information for your doctor. [Details](#).

Practical Nutrition -

- [6 Natural Foods to Reduce Systemic Inflammation and Oxidative Stress](#) - See why that's important, and achievable with natural foods, from registered dieticians, [here](#). Summary: salmon and sardines, green tea, berries, whole grains, tumeric, extra virgin olive oil. [Peter and Elsa P.]
- [Eating Oatmeal Daily is a Good Thing](#) - See why, [here](#).
- [Which Oats Are Best: Steel cut, Rolled, or Instant](#). Sorry oats chauvinists, from a nutritional science point of view it doesn't matter, *if it's all just oats* (read the contents label) - [details](#) and recipes. *You* choose the additives, but no butter or sugar, and minimal *reduced Sodium* iodized salt. If cooking oats in a vegetable or chicken stock, rather than water, the stock may have all the additives you need, and more. Eat oats! [Peter and Elsa P.]
- [Foods to Increase Your Good Cholesterol \(HDL\)](#) - Seven foods that registered dieticians recommend for this, and that will [help reduce systemic inflammation](#). Summary: 1) olive oil, 2) salmon, 3) beans and legumes, 4) avocado, 5) whole grains, 6) nuts and seeds, 7) berries. Drugs/supplements not needed. [Peter and Elsa P.]
- [Best Canned Foods for Controlling High Blood Pressure](#) - as recommended by registered dieticians, [here](#). Tune-up: choose low Sodium versions, pour off some of the packing fluid from canned beans to reduce salt, try the Hey-Day Canning line.
- [Are Potatoes Nutritious?](#) - Yes, [potatoes are very nutritious](#), being rich in vitamin C, potassium, and fiber. They're also surprisingly high in protein. But .. you're eating them wrong. [Most of the nutrition is in the skin](#), so ... **Don't Peel Potatoes**. Just wash them gently with a fiber (not metal) scrubber. Also no butter, sour cream, excessive salt (use low Sodium salt), bacon or other *loadings*, because of the added saturated fat. If you must fry, the oils to use are avocado oil (500°F smoke temperature) or peanut oil (450°F). Read the contents on the label of frozen potatoes - many ways to go wrong there. There's nothing wrong with frozen potatoes, but companies use the opportunity to put in all kinds of additives that turn a good thing into a bad thing. Contents.
- [Misleading Words For Sugar](#) - High-fructose corn syrup, sucrose, barley malt, dextrose, maltose and rice syrup are all [forms of sugar](#). Certain blood alcohols sometimes used as sweeteners, such as Erythritol and Xylitol, are made by the body and occur naturally in certain foods - but in very small amounts. They have recently been [linked to heart disease and stroke by Cleveland Clinic researchers](#), and should be avoided.
- [Is Your Favorite Food Ultra-Processed?](#) - and if so, what's a good substitute. View the Northeastern University [TrueFood Dashboard](#).

- Most Nutritious Vegetables and Fruits Rank-Ordered by CDC - See the list [here](#). Chinese cabbage = bok choy.

Environmental Science News -

- US Treasury Department and IRS Final Rule on Wages for Clean Energy Projects - Tax credits provided for under the US 2022 Inflation Reduction Act "... can receive a [fivefold increase for clean energy tax credits](#) for deployment of wind, solar, nuclear, hydrogen, and other clean energy technologies ...", provided that wages and apprenticeship programs for a project meet the guidelines of the [final rule](#).
- Disaster-Proof Florida Homes - in Cortez Florida south of Tampa. They've already survived two major hurricanes with minimal damage, and are built to be net-zero (no electric bills, producing their own power in a microgrid). The Hunters Point houses are LEED-certified, three stories, with garage spaces on the ground floor in case of storm surge. [Details](#). [Gerry C.]
- Hurricane Proof [Accordion Shaped](#) 69 MW Solar Array - is being installed in Jobos, a hurricane prone part of western Puerto Rico by the Australian company '5B'. 100 MW of energy storage, 1,392 panels, withstand wind speeds up to 166 mph, installation late 2024. [Specs](#).
- Large Solar Farm Goes Live in East Tennessee - The 2.8 MW White Pine Solar Farm in White Pine Tennessee has begun operations - in cooperation with the Tennessee Valley Authority's Dispersed Power Program and Morristown Utility Systems. [Jefferson County and Hamblen County schools will receive benefits](#). See also the solar farms being sponsored by Vanderbilt University near Brownsville TN, 60 miles East of Memphis. [Mack W.]
- Homeowner Mutiny in Florida - Redington Shores in Pinellas County FL sits on a thin barrier island that forms the west side of Tampa Bay. There's not much left of their protective beach, and they've called on the US Army Corps of Engineers to do a [sand replenishment](#) - \$41 million. The Corps is willing, but won't act until [public access easements from the homeowners](#) are in place. But ... about half the homeowners have refused to sign. So ... stalemate, with NOAA predicting what may be an historic hurricane season. One big wave ...
- Objections to Coal Dust in Curtis Bay, South Baltimore MD - The Curtis Bay community is asking Maryland regulators to clamp down on coal dust contamination arising from the [CSX coal export loading docks](#) there. Activity at the two coal terminals has reached an all-time peak. [Dave P.]
- High Speed Trains Go to Vegas - The current [Brightline high speed train in Florida](#) runs between Miami and Orlando [Brightline West](#) [see video] has just begun construction on a \$12 billion, 186 mph, 218 mile route between Los Angeles and Las Vegas - mostly in the median of Interstate 15.
- Shopping Centers Near Transit Stations Boosts Both - [MCB Realty's](#) newly acquired [Takoma Park Shopping Center](#) is near the future [Long Branch Station of Maryland's Purple Line](#) light rail system. Smart to think ahead to the opening of the new station - expected Spring 2027, at which time thousands of new customers will suddenly be within *walking distance* of the shopping center. See map of Purple Line stations [here](#). Win win!
- Baltimore's New East-West Red Line Will be [Light Rail](#) - rather than rapid buses. Congratulations to Maryland [Gov. Wes Moore](#) for finding a way forward when others had given up. Updated news [here](#). [Map](#) [Dave P.]
- Sweden's 'Enride' Partners With UAE on Autonomous Trucks - The company will establish a shipping [network across the UAE](#) based on its autonomous electric truck fleet. Details on this and other Einride projects [here](#).

- New Lucid Motors Car Shows World's Highest Energy EV Efficiency Rating - The newly certified [efficiency](#) rating of [5 miles per kWh](#) is easily the best in the world, translating to increased range and decreased charging cost for the recently released rear wheel drive version of the 'Lucid Air Pure'. The [company](#) [Newark CA] credits its vertically integrated manufacturing, and produces its own motors, inverters, and battery packs.
- Small Hydrogen Powered VTOL Aircraft - Serius Aviation is planning two small business aircraft, 3 passengers and 5 passengers: zero emissions, quiet (60 dBA), hybrid hydrogen/electric propulsion, range 1,150 miles, speed 323 mph, max altitude 30,000 feet. [Photos](#) and details.
- Producing Green Hydrogen More Efficiently - The standard method is electrolysis - power intensive and uses up electrode material that must be replaced. Researchers at RMIT University in Melbourne Australia have devised a [method that achieves a 27% improvement in efficiency](#) using extreme high frequency ultrasound (10MHz) to create the required dissociative reaction at neutral pH ranges so as to avoid corrosion at the electrodes that can result in contamination. The method also avoids the use of expensive electrode materials such as Platinum and Iridium. The university is now looking for partners to scale up the process. Stay tuned. [Publication](#).
- Progress on Investigating Geothermal Energy - The Utah Frontier Observatory for Research in Geothermal Energy ([Utah FORGE](#)) [videos] is located in an underground field laboratory in Beaver County Utah, is funded by the US Department of Energy, and is the largest geothermal energy experiment in the US. In April their [fracking efforts struck a gusher](#) (of recirculating hot water turned into energy bearing steam). This is proof of principle that *24/7 energy is available* in many parts of the US. The next stage is development of a demonstration project at scale.
- Neighborhood Scale Geothermal Energy Sharing Project in Framingham MA - good explanatory video, [here](#). More detail [here](#). [Rob R.]
- Silicon Solar Manufacturing and Dual-use Photovoltaics Incubator - is the US Department of Energy, Solar Energy Technologies Office, name given to its \$27 million grants program to boost development of next-gen solar technologies and manufacturing. A competition was held in 2023, and [10 grants have now been awarded](#). See the full list [here](#), including a further 8 projects to boost thin film solar technology. Total grants: \$77 million.
- Huge Grid-Connected Storage Battery To Be Added to Large UK Offshore Wind Farm - The Danish renewable energy company Ørsted will [add a 300 MW Tesla battery](#) to stabilize grid power from the UK's 2.9 GW [Hornsea 3 \[map\]](#) Offshore Wind Farm (power for 3.3 million homes by 2027) ... in Swardston, near Norwich in East Anglia. The battery system has a capacity of 600 MWh, equivalent to the daily energy use of 80,000 homes, and is expected to be operational by the end of 2026. Hornsea 1 at 1.2 GW, and Hornsea 2 at 1.3 GW, are already on line.
- TDK Achieves 100x Previous Energy Density in New Solid State Battery - Apple supplier TDK, using lithium alloy anodes with an oxide-based solid electrolyte, has achieved an energy density of 1,000 Whr/L, 100 times their best previous density. When applied to low power devices such as iPods, smart watches or hearing aids, [safety will be improved and recharge time reduced](#). Next, manufacturability at scale - no exotic materials used. See what this kind of energy density could do for EV range, [here](#).
- Turning Graveyards Into Solar Farms - in Valencia Spain. The city plans to install a total of [6,658 solar panels over its cemeteries](#), with the capacity to produce 440,000 kW of electrical power annually. More than 440 tons of CO2 will be avoided annually, no new land is required, and 25% of the generated power will be allocated to 1,000 vulnerable households. All public spaces and buildings will be converted to LED lighting. A win! [Hugo]
- Which Countries Produced the Most Solar Power in 2023? - See a chart [here](#). China and then the US.

- [5 New and Better Battery Technologies](#) - video [here](#). Get a battery education.

Other Science News -

- [\\$250 Million Addition to Apple Hub in Singapore](#) - Construction will begin this year on additions designed to meet the LEED Gold environmental building standard, and use 100% sustainable energy - 800 solar panels are already mounted on existing buildings. Apple also plans to increase operations in Vietnam, Indonesia and India on a similar, environmentally sensitive basis.
- [New Micro-Capacitor Technology Allows Energy Storage Directly on Microchips](#) - Researchers at Lawrence Berkeley National Laboratory and University of California Berkeley have achieved [very high energy densities in micro capacitors](#) using thin films of hafnium oxide and zirconium oxide. The [new tech](#) may be useful for low power consumption microelectronics because the short distances of on-chip construction avoid energy losses.
- [AI-Assisted Soldier's Gun That Never Misses Against Drones?](#) - or anything else. [ZeroMark](#). Ready or not, [here](#). More [details](#).
- [Latvia Sends 30-40 Cars to Ukraine Each Weekend](#) - that have been [confiscated from Latvian drunk drivers](#). The Ukrainians customize them, and use them to support the war effort. Shades of Mad Max.
- [F-16s To Operate in Ukraine This Summer](#) - The first F-16s from the Netherlands are expected to [arrive in Ukraine this Summer](#), along with the first trained pilots, and the first trained technicians to maintain them.
- [Airbus is Proposing a Stealthy Loyal Wingman Drone](#) - to the German Air Force. Very cool look, [here](#). No specs yet, but it has a supersonic look to it.
- [Samples From the Far Side of the Moon](#) - The Moon is gravitationally tide-locked to the Earth, such that the same side of the Moon always faces the Earth (Near Side). For the first time in human history, samples of the Far Side have been returned to Earth ... by China's Chang'e-6 robotic spacecraft. See a photo of the return capsule at its Inner Mongolia landing site, a video, and details [here](#). China is now planning a *crewed* flight to the Moon, and [deep space probes](#) to Mars and Jupiter. Luck to them. Humanity is on its way out there!

Nice Thing - [full screen]

West Side Story - Broadway musical with music by Leonard Bernstein and lyrics by Stephen Sondheim - 1957 - based on Shakespeare's Romeo and Juliet, transposed to 1950s New York City.

- [The Balcony Scene](#) - in concert at the BBC Proms in 2012 at the [Royal Albert Hall](#) in London - [here](#).