

## Betsy says HI!!!!

### Announcements:

- **The next LABQUEST meeting will be this Wednesday, June 12 at 12:30 in the trailer. May meeting has been cancelled.**

### Science Report Highlights

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

- Vitamin B12 Deficiency Can Mimic Symptoms of Dementia
- MIND Diet May Slow Aging and Reduce Dementia Risk
- Sleep, and Health Outcomes
- Choosing the Healthiest Peanut Butter
- DOI Final Rule To Reduce Waste of Natural Gas
- Largest Foreign Direct Investment in a New Project in American History – chip production
- Blended Wing Passenger Aircraft (highlighted at the LABQUEST meeting)

### 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).

- [Drug Resistant Gonorrhea Increases in China](#) - [Details](#). Whereas there are still few cases in the US, the CDC has said "Little now stands between us and untreatable gonorrhea." [Publication](#).
- [Vitamin B12 Deficiency Can Mimic Symptoms of Dementia](#) - The body doesn't make Vitamin B12, so it must be taken in as a natural part of food, or by vitamin supplement. Foods like meat, dairy, and eggs provide B12, so vegans, or those switching to a mostly Mediterranean diet approach, should give this special attention. Also, **some older adults don't take up Vitamin B12 efficiently**, and may need supplements - with a doctor's advice.
- [MIND Diet May Slow Aging and Reduce Dementia Risk](#) - according to a [study](#) done by the Columbia University School of Public Health - [details](#). MIND: Mediterranean-Dash Intervention for Neurodegenerative Delay - [foods](#).
- [Counterfeit Botox](#) - CDC is [reporting](#) that 19 people in 9 states have experienced harmful reactions after receiving counterfeit botulinum toxin injections (botox).
- [CDC Tips on Reducing Stress](#) - and why that's important, [here](#). Not complicated.
- [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 -

- MRI Prostate Cancer Scans in the UK - The standard procedure is two scans, followed by a third scan using an injected Gadolinium contrast agent. A currently running Phase 1 study being done by the University College of London reached the [preliminary conclusion](#) that dropping the third scan would have no impact on diagnostic accuracy, 29% either way. This would cut the [cost of the series in half](#) - if the first two scans were of high quality - and would reduce the time to diagnosis substantially.

#### Other Health Science News -

- Arsenic in Private Well Water - About 2 million people in the US use private well water contaminated with naturally occurring arsenic, according to the Environmental Protection Agency - studies have shown an association between arsenic exposure and: cardiovascular disease, diabetes, kidney disease, impaired lung function, and various cancers. Effective filters for arsenic are available, and in a [recent study](#) done by the Johns Hopkins School of Public Health, volunteers showed a reduction in urinary arsenic of 47% when filters were used. Summary: those using water from private wells should have the water tested for the full spectrum of possible toxic materials, including naturally occurring ones like Arsenic. Before you can fix it, you must first know there's something that needs to be fixed. [Publication](#).
- Why Some Get Lyme Disease (LD) and Others Don't - Two genes are known to predispose for a higher risk of LD. [Researchers have now discovered a third gene](#) that makes a type of protein found in skin and sweat - It predisposes to LD in its variant form, but can actually prevent the growth of LD-causing bacteria in its standard form. About 60% of the US population has the standard form, and are [protected from LD to some extent by their sweat!](#) Panels of genetic scans for predisposition to various diseases will increasingly be a part of wellness medicine. This newly discovered gene would make a useful addition, and could also lead to more effective prevention/treatment. LD is spread primarily by black legged ticks. [Eileen J.]
- Lone Star Ticks - were once centered in the Southeast and parts of the midwest, but are spreading and are now being reported in New Jersey, Delaware, New York and Connecticut. Details on which diseases they carry [here](#). Lone star ticks are much more aggressive than black legged ticks.
- Human Milk and Gut Microbiome Repair - details [here](#). Researchers are currently focused on complex sugars called human milk oligosaccharides (HMOs), the third most abundant component of human milk - not found in cow's milk or infant formula. The hope is that their benefit in supporting the infant microbiome could be useful for adults as well, for conditions as divergent as asthma, diabetes and allergies. [Prolacta Bioscience](#) (Duarte CA) is currently conducting a Phase 2 human trial testing the safety and effectiveness of HMOs, in combination with the bacterium *B. infantis*, for adult patients with blood cancers who are undergoing stem cell transplantation. Success could provide a much more targeted therapy than fecal implants, with fewer side-effects and risks. [Background](#). Stay tuned.
- At What Age Does Empathy First Emerge - A study done by psychologists at [Ludwig Maximilian University](#) (München Germany) concluded that children first begin to experience empathy at about 18 months - an important developmental step that begins with recognizing themselves in the mirror. Summary: [empathy, and methods of coping with the feelings that go with it, are socially acquired](#). Caregivers are key. [Hugo D.L.H.G.]
- Sleep, and Health Outcomes - Unusually short or long sleeping patterns have long been assumed to lead to negative health outcomes. A recent [study](#) led by Oxford University indicates that having a *regular* sleep pattern may be more important - 20%-48% lower risk of all-cause mortality, 16%-39% lower risk of cancer mortality, 22%-57% lower risk of cardio-metabolic mortality. [Publication](#). [Podcast](#).

- [Progress on Orally Administered Weight Reduction and Type 2 Diabetes Treatment](#) - Eli Lilli (Indianapolis IN) has [announced](#) encouraging preliminary results for its treatment candidate [orforglipron](#) for both indications - significant weight reductions, waist size reductions, BMI reductions ... and reductions in A1C for diabetes. Phase 3 clinical trials for both indications are proceeding. Stay tuned. [Publication](#).
- [Can Viagra Reduce the Risk of Alzheimer's Disease \(AD\)?](#) - Researchers at the University of London, working with the very large database of patient information from the UK National Health Service, and adding their own lab-based work, have recently [published](#) a study suggesting an [18% reduced risk](#). The active component of Viagra is *sildenafil*, one of a class of phosphodiesterase type 5 inhibitors. More work is indicated along these lines. This is not a cure for AD.
- [Traumatic Brain Injury \(TBI\)](#) - CDC advice on the symptoms, causes, and ways to avoid TBI - especially for those over 75, and young athletes engaged in contact sports. [Here](#).
- [Kidney Injury and Gut Barrier Dysfunction from Polystyrene Microplastics](#) - See [details](#). Summary: Induces chronic kidney disease, has a direct impact on renal cells, impairs the function of the gut barrier.
- [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 -

- [Tips to Lose Belly Fat](#) - [Details](#). These 18 suggestions are very well laid out to be understandable/practical, and have been medically reviewed. Don't neglect point #5 on stress, or point #14 on fruit juice - whole fruit is best.
- [Are Chia Seeds Healthy?](#) - Yes! See the details from a dietician's [here](#). Summary: Amazing amount of fiber, good omega-3 fatty acids (anti-inflammatory/antioxidant), raises HDL and lowers LDL cholesterol, lowers blood pressure, good minerals and vitamins. Be on the look-out for allergies. Small amounts are powerful.
- [Choosing the Healthiest Peanut Butter](#) - See a registered dietician's advice [here](#). Peanuts are generally healthy, and have protein which helps to make you feel full - and so not inclined to overeat - but most major brands put in so many unhealthy additives that the result *isn't* healthy. Summary: Go for a short list of contents ... peanuts and just a little salt/Sodium. Avoid added sugar, preservatives, most oils, and unpronounceable chemicals. Nutritionally, it doesn't matter if it's creamy or crunchy, so choose to suit your taste.
- [Foods to Avoid For Those With Inflammatory Arthritis](#) - and some to seek out, as recommended by a registered dietician, [here](#).
- [Misleading Words For Sugar](#) - High-fructose corn syrup, sucrose, barley malt, dextrose, maltose and rice syrup are all [forms of sugar](#).
- [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 Department of Energy \(DOE\) Final Rule for Increasing Light Bulb Energy Efficiency](#) - As of July 2028 the mandated efficiency will rise from 45 lumens/Watt to 120 lumens/Watt. Bulbs already

purchased or produced will not be affected. DOE had previously implemented minimum lightbulb efficiency standards which set levels that cannot be met by energy-inefficient *incandescent* bulbs. The newly finalized, higher efficiency level can be met by a broad variety of widely available LED bulbs, but not by *compact fluorescent* bulbs (CFLs). [Consumer costs and Carbon emissions will be substantially reduced.](#) Thanks DOE Secretary Granholm.

- [US Department of the Interior \(DOI\) Final Rule on Increasing Prices for Oil/Gas Leases](#) - DOI's Bureau of Land Management (BLM) has revised the [fiscal terms](#) of the onshore federal oil and gas leasing program for federal lands - not done comprehensively since 1988. Examples: minimum lease bond from \$10,000 to \$150,000, minimum royalty rate from 12.5% to 16.67%, minimum bid from \$2/acre to \$10/acre. Thanks Secretary Haaland.
- [DOI Final Rule on Reducing Prices for Renewable Energy Leases](#) - Acreage BLM rents and capacity fees for wind, solar and geothermal projects on public lands are [reduced by up to 80%](#). Additional [background](#).
- [DOI Final Rule To Reduce Waste of Natural Gas](#) - from venting, flaring, and leaks during oil and gas production activities on federal lands. The [new rule](#), the first update in 40 years, is expected to generate \$50 million in additional royalties annually, and conserve billions of cubic feet of natural gas.
- [Drinking Water Extracted from Desert Air](#) - Engineers at the UAE's Khalifa University are preparing a patent application for their [invention](#). There are several other groups working on the issue independently. Go!
- [Kitty Hawk Wind Farm](#) - See a map, and the status of this 3.5 GW wind farm 36 miles offshore from Virginia Beach VA, [here](#) - power for 1 million homes, Carbon equivalent to taking 500,000 cars off the road.
- [Enhanced Geothermal Systems \(EGS\)](#) - [access naturally very hot rock strata two miles or more down](#), strata that are found *everywhere* at that depth, not just in the vicinity of hot springs. The drilling technology already exists, with a few modifications to the fracking methodology (fewer chemical additives, no hydrocarbons released). The US Department of Energy (DOE) has already invested more than \$200 million in an experimental site in Utah, and is also allowing companies to convert permits for oil or gas exploration into geothermal licenses, reducing paperwork and delays. Thank you DOE Secretary Granholm.
- [Enhanced Geothermal Energy in Bavaria](#) - [Favor Technologies](#) (Calgary, Alberta Canada) is making [progress \[video\]](#) on construction of its [new geothermal plant](#) in Geretsried, Southern Germany - 23,000 feet deep, closed loop water. European governments have invested \$100 million in the plant. 25% of Europeans live in areas with geothermal potential - baseload power for when the sun doesn't shine, and the wind doesn't blow.
- [Very Large California Grid-Connected Battery Project](#) - The 680 MW, \$1 billion [Nova Power Bank](#) in Menifee CA near Los Angeles will be able to power 680,000 homes for 4 hours ... back-up for the state's renewable power.
- [Nuclear Renewal in Canada](#) - The Canadian government has approved a \$1.5 billion [refurbishment of the 1971 Pickering Nuclear Power Generating Station near Toronto Canada](#), due for completion in mid-2030 for an additional lifetime of 30 years - 2 GW, power for 2 million homes.
- [Permanent Storage Site For Spent Nuclear Fuel in Finland](#) - Read a description of the 1,480 foot deep site [here](#).
- [Hydrogen Powered Train Sets Distance Record](#) - by going 1,742 miles over 46 hours (continuous) on a test loop at the US Department of Transportation's Federal Railway Administration's [Transportation Technology Center](#) in Pueblo Colorado. The [Swiss](#) company

Stadler's H2 train set, built for service in San Bernardino CA, consists of two electrically powered end cars with a power unit in the middle with fuel cells and hydrogen tanks. The fuel cells are fed hydrogen to generate electrical power to charge the battery, which also *recovers* energy from regenerative braking - seating for [108 passengers plus standing room, operates at speeds up to 79 mph](#). The train will run on the Arrow line, a 9-mile route connecting San Bernardino and Redlands, California. [Phil J]

- [Morocco Already Has the World's Largest Concentrated \(Tower\) Solar Power Plant](#) - the [Ouarzazate Solar Power Station](#) - 1,740 acres, 580 MW, power for 500,00 homes. Now they will also build the first phase of a high capacity plant for producing green Hydrogen. [Details](#).
- [Large Solar+Storage Project in Utah](#) - The [Green River Energy Center](#) in Emery County UT now has a \$1 billion financing commitment, and [rPlus Energies](#) (Salt Lake UT) expects to [begin construction 2H24](#) - 400 MW of solar power generation, plus an increase to 1,600 MWh of battery storage! Emery County had been relying on coal mines and coal fired power plants that are now closing. Win! Win!
- [Microwave Electromagnetic Radiation Converts Industrial Waste to Useful Materials](#) - Engineers from the [University of West Virginia](#) have received a [\\$3 million grant from the US Department of Energy](#) to further their development of a microwave reactor to convert industrial waste to ethylene and ammonia at a much lower cost (85% less) than alternatives in terms of energy, and with less carbon production. Win win win! Good luck.
- [Tesla Aiming for Lower Costs With Manufacturing Changes](#) - by moving from the traditional production line to what the company is calling the '[unboxed](#)' approach. The company says it may be possible to cut production costs by as much as half. Details were scanty We'll see.

#### Other Science News -

- [Largest Foreign Direct Investment in a New Project in American History](#) - according to [Secretary of Commerce Gina Raimondo](#). Taiwan Semiconductor (TSMC) will invest \$65 billion in its third leading edge (**2 nanometer** detail) chip factory in Phoenix AZ - on line in 2028. The Department of Commerce is adding a [\\$6.6 billion grant funded by the 2022 US CHIPS and Science Act](#). This factory will produce TSMC's most advanced chips. 70% of TSMC customers are US companies that may also benefit from the tax credit advantages of the 2022 US Inflation Reduction Act by using domestically sourced components.
- [Robotic Toilet Cleaner](#) - See a [video](#) of [Somatic's](#) (NYC NY) robot doing its chores autonomously. [wait out ad, turn on sound, full screen]
- [Blended Wing Passenger Aircraft](#) - In March [JetZero](#) (Long Beach CA - video) announced that the [FAA has issued an airworthiness certificate](#) for the company's 1:8 scale blended wing-body demonstrator plane, and test flights are expected to start soon. Among the design goals is a 20-40% reduction in fuel-burn and emissions, and the use of sustainable aviation fuel (SAF) - eventually Hydrogen fuel. The traditional 'tube and wing' shape shifts to a design blending the body and the wing together, such that the entire aircraft contributes to lift, minimizes drag, weighs less and generates less noise. The US [Air Force is supporting the project](#) for military applications. Sustainability starts with efficiency. Details and renderings [here](#). **It's also beautiful.**
- [Next-Gen Lunar Rover](#) - See ([concept](#)) one of NASA's ideas for the rovers to be used at the moon base.
- [Europa Clipper](#) - NASA will be on the way to [Europa](#) late this year, if all goes well, to arrive in 2030. One of the top goals is to look for biological traces of life. Also see an excellent video of uses for the new moon rover.

- Robots Fighting Robots in Eastern Ukraine - not a new concept, but the latest wrinkle is the small, uncrewed ground vehicle (UGV) that can be used for a [variety](#) of purposes. [Details](#).
- Stranded Fishermen Use Low Tech Signal for Rescue - There they were, no working radio, on a tiny uninhabited atoll (Pikelot Island) in the middle of the Pacific Ocean. They cleverly (or desperately) used the available materials (palm fronds) to stake out the word 'HELP' on the beach. Then a US Navy P-8 Poseidon surveillance jet (out of Okinawa Japan, very *high* tech) flew over .. 'received' the low tech signal ... interpreted it correctly .. dropped survival packs ... and called the cavalry - well done Navy! A day later a Coast Guard HC-130 flying out of Hawaii dropped survival packs and a radio so the fishermen could request a rescue (rules are rules) - well done Coast Guard! The USCG Cutter Oliver Henry promptly arrived on the scene to rescue the fishermen and their out-of-commission 20 foot skiff - well done again to the Coast Guard. But ... special kudos must go to the far sighted Coast Guard HR department. A member of the rescue landing party was a native Micronesian, spoke the fishermen's language, and was related to them all (third and fourth cousins)! Photos and details, [here](#). [Mike C., Peter P.]

Nice Thing - [skip ads, full screen]

Moonlight on the Beach -

- Moonlight Sonata (Third Movement) - Beethoven - marked *presto agitato*, both passionate and precise, as performed by Peter Buka, [here](#).
- Moonlight Sonata (Third Movement) - performed by Valentina Lisitsa, [here](#).
- Moonlight Sonata (Third Movement) - with the score, and informal commentary by the pianist, [here](#).