

Science Report Highlights

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

- MRI Mishap
- Poison Centers Report 1500% Increase in Overdoses from Diet Drugs
- FDA Warning on *Counterfeit* Ozempic (semaglutide). We think this advise should be followed with any counterfeit drug.
- Software as a Medical Device (using AI)
- Hair Loss
- 7 Factors for Aging Well
- Sustainable Energy Progress Worldwide in 2023
- Unexpected Use for Chicken Feathers

Science Report

Self-Protective Measures

You should get your medical advice from your doctor or pharmacist, not from this Report or the internet, and *do* get vaxxed for Covid, [shingles](#), HPV (girls *and* boys as young as 9), [RSV \(>60\)](#), [RSV \(<8mo\)](#), and the flu per recommendation by FDA and CDC - unless your doctor advises against, based on your personal medical information.

- MRI Mishap with Firearm - read an unfortunate patient's story [here](#). MRI machines generate magnetic fields a thousand times more intense than those at the surface of the sun. You should leave behind all of your piercings, jewelry, coins, phones, crucifixes, Iron Age artifacts, throwing stars, toy cars, lucky horseshoes, magnetic eyelashes, house keys, and, of course, firearms. Also, *do* let your doctor and the MRI techs know if you have any **metallic implants**. A few are approved by the FDA as safe for MRI scans, but many are not. The complete details on any implants, including their MRI status, should be kept in your medical records. [Ron M.]
- Poison Centers Report 1500% Increase in Overdoses from Diet Drugs - Self-dosing overdoses, compounding pharmacy mistakes using inappropriate chemical forms of the active ingredient, counterfeit drugs - [Details](#).
- FDA Warning on Counterfeit Ozempic (semaglutide) - FDA advises wholesalers, retail pharmacies, health care practitioners and patients not to use the *counterfeit* product described in the Agency's notice, [here](#). Adverse events have been reported. FDA: "Patients should only obtain Ozempic with a valid prescription through state-licensed pharmacies and check the product before using for any signs of counterfeiting."
- TGI Friday's Boneless Chicken Bites - [Details](#). The US Department of Agriculture's Food Safety and Inspection Service has [announced](#) the recall of a 26,550 pounds batch of this product by its supplier Simmons Prepared Foods (Van Buren AR) after bits of clear hard plastic were found by consumers. View labels [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 -

- Moderna (Cambridge MA) - The company has [announced](#) encouraging preliminary results from using its melanoma cancer medication mRNA-4157 in combination with Merck's cancer medication Keytruda to produce a personalized cancer vaccine. [Preliminary result](#): reduced risk of recurrence of late stage melanoma by 49%.
- Advanced Renal Cell Carcinoma (RCC) - [FDA](#) has approved belzutifan ([Welireg](#), Merck) for this condition.
- Atrial Fibrillation (Afib) - CDC description and very clear animation [here](#). FDA has [cleared](#) the 'PulseSelect Pulse Field Ablation System' (Medtronic, Minneapolis MN) for cardiac electrophysiological mapping (stimulation and recording), and to treat Afib using electrical pulses to ablate cardiac tissue. CDC projects that 12.1 million people in the US will have the condition in 2030.
- High-Risk Neuroblastoma (HRNB) - FDA has [approved](#) eflornithine (IWILFIN, [US Worldmeds](#), Louisville KY) to reduce the risk of relapse in adult and pediatric patients with HRNB who have demonstrated at least a partial response to prior multiagent, multimodality therapy including anti-GD2 immunotherapy. [Details](#).
- Advanced Endometrial Cancer - When caught early, standard-of-care surgery can be successful for treating endometrial cancer, but the 5-year survival rate for *advanced* endometrial cancer is only 18.4%. Based on encouraging preliminary data, [FDA has now granted Breakthrough Therapy Designation](#) to BioNTech (Mainz Germany) and Duality Biologics (Shanghai China) for their Antibody-Drug Conjugate Candidate BNT323/[DB-1303](#). This designation will accelerate the process of developing actionable data for submission to FDA. BNT323/DB-1303 has shown antitumor activity for certain other types of solid cancerous tumors. Promising.
- Software as a Medical Device - The already FDA cleared NaviCam Small Bowel Capsule Endoscopy System is designed to travel through the digestive tract, taking pictures as it goes to look for suspected bleeding. FDA has now authorized AI-assisted software from [AnX](#) Robotica, ([NaviCam ProScan](#)) to aid in decreasing the time to review and analyze the capsule endoscopy images, and present the reader with any images of bleeding.
- First Non-Prescription Oral Contraceptive - FDA has [approved](#) Opill (norgestrel) for nonprescription use - drug stores, convenience stores, grocery stores, and online. Almost half of the 6.1 million pregnancies in the US each year are unintended. Availability early 2024. Explanation by a Columbia University OB/GYN [here](#).

Other Health Science News -

- A Doctor Explains Why Lead Water Pipes Must be Removed - [here](#). There is [no safe level of lead for children](#).
- Hair Loss - A nutritionist, dietician and trichologist (hair/scalp doc) say there are 7 nutrients that help prevent hair loss, [here](#). Summary: protein, vitamin A, green tea, Iron, vitamin D, probiotics, omega-3 fats.
- LED Light Therapy Face Masks - [are being used](#) with the aim of accelerating production of new collagen and improving blood circulation. Wavelengths of light in the red and near infrared are in use. Little scientific evidence is available.
- 7 Factors for Aging Well - according to geriatricians, [here](#). Summary: 1) learn new things, 2) be honest about needs, 3) have a community, 4) prioritize physical health, 5) do enjoyable things, 6) ask your doctor about deprescribing medications no longer needed, 7) plan ahead (not for end of life, but for the 20 years before).
- Preventable Risk Factors for Parkinson's Disease (PD) - [Details](#). The University of Alabama has published new research pointing to two particular avoidable risk factors: 1) Repeated blows to

the head **in sports like football**, even those that don't cause concussion and seem harmless, **doubled the risk of PD** later in life, 2) Exposure to pesticides, herbicides or military-related chemical exposures. Together, head injury and exposure to environmental toxins may account for nearly **1 in 3 cases of PD in men, and 1 in 4 in women**. [Publication](#).

- [Penicillin/Amoxicillin Allergy??](#) - About 10% of the US patient population reports that they have had an allergic reaction to penicillin, but CDC estimated that [less than 1% actually are allergic](#) - with the result that many patients are denied the benefits of penicillin. **You are *not* allergic to penicillin unless your doctor has specifically tested you for that.** See the result of a study done by Vanderbilt University [here](#).
- [PFAS and Colorectal Cancer \(CRC\)](#) - 80% of CRC cases are said to be related to environmental factors, such as exposure to [PFAS](#). [New research](#) points to PFAS having a role in spreading cancer cells. [Details](#)
- [Male Birth Control Pill](#) - [YourChoice Therapeutics](#) (San Francisco CA) has begun dosing male volunteers in a Phase 1 clinical study in the UK of YCT-529, the company's candidate for the first hormone-free male birth control pill. Preclinical (animal) studies, partly funded by NIH, showed YCT-529 was 99% effective and 100% reversible with no side effects - as effective as, or better than, the female birth control pill or condoms. [Details](#).
- [Birdsong and Mental Health](#) - A recently published [study](#) showed a positive association between seeing birds, listening to their songs, and the mental health and sense of well-being of both healthy people, and those diagnosed with depression. The author suggests that "Visits to habitats with a high degree of birdlife could become part of social prescribing schemes, playing a role in preventing mental health difficulties and complementing more traditional interventions." For those living in the DMV, the new bird house at the National Zoo is now open. [Bernie A.]
- [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 -

- [10 Must-Avoid Foods for Weight Control in 2024](#) - and why, [here](#). Don't even get close to them.
- [16 Healthy-Brain Breakfast Recipes](#) - that take only 3 steps, [here](#).
- [A Banana Before Bed for Sleep](#) - A nutritionist gives the [details](#). Tune-up: choose a slightly green banana, peel and put in the freezer for 15-20 minutes, repeatedly dip the end in a small cup of tart concentrated cherry juice (buy at store from refrigerated case), and eat like a popsicle at least 30 minutes before bedtime. You can also peel, wrap and pre-freeze some slightly green bananas, pull one out at a time to thaw for 10 minutes, then dip and eat as above.
- [8 Low Carb Nutritious Vegetables](#) - and how to eat them, as advised by a registered dietician, [here](#).
- [Best Fruit for Weight Loss](#) - The registered dieticians in [this article](#) recommend pomegranate - the seeds (arils) are best, since more of the nutrients are intact, but the juice is also recommended (buy from cold case at grocery). Benefits: fiber (improves satiety, reduces overeating, improves gut health), low calorie count, antioxidants promote fat loss.
- [Nutritional Benefits of Chia Seeds](#) - [here](#). Summary: Improved heart health and cholesterol, Anti-cancer properties, Anti-inflammatory properties, Antimicrobial properties, Antioxidant properties, Improved intestinal health, Weight loss, Decreased risk of developing diabetes. See the Mayo Clinic's take [here](#). Using them is simple - just sprinkle some into whatever you're cooking, and you're done.

- Beans - are very healthy. See 11 benefits of eating beans [here](#), along with a table giving the nutritional profile of 5 types of beans. Note: black beans have a good texture, and blend well with other foods - cook up dried beans with a low Sodium vegetable, mushroom, or chicken bone broth stock.
- Brussels Sprouts - According to a gastroenterologist, they are the most underrated vegetable (great fiber and antioxidants). [Details](#). Tune-up: raw/shaved into salads, or baked with balsamic vinegar.
- 5 Nutritional Benefits of Pistachio Nuts - [here](#). Summary: [antioxidant](#) rich, [heart](#) healthy, eye health, [weight](#) management, helps [manage blood sugar](#). [Sandy S.]
- Super-Firm Tofu - Soy is excellent for nutrients (low cal, low fat protein), but is quite watery in its usual form. Start with the 'super-firm' version offered in some stores, and use some of the techniques described [here](#) to further dry and firm it for use in salads or stir-fried dishes where firmness is desired.
- Mediterranean Diet Meal Delivery Services - See 8 that are recommended by registered dietitians, [here](#). Tune-up: choose a service that offers transparent nutritional information and a comprehensive contents list, organic choices, low sodium choices. Mediterranean: vegetables, fruits, whole grains, nuts, seeds, beans, fish, legumes, olive oil, herbs, and spices, with limited dairy, eggs, chicken and red wine.
- Which is the healthier Lettuce, Romaine or Iceberg? - Short answer, [Romaine](#). Dark leafy greens like Spinach, Kale, Dandelion Greens, Mustard Greens, Watercress, and Chard are even healthier, but they have a strong flavor and aren't members of the Lettuce family. [Marlene T.]
- Can Eating Grapes Help Control Weight? - A registered dietitian describes the four ways grapes can help you lose weight, [here](#).
- Food that Nutritionists and Dieticians Avoid - and what they would substitute. They name them and say why, [here](#). Summary: processed foods high in sugar and salt (Sodium), sodas, sports drinks, sugary beverages, cured meats, smoked fish, canned soups, frozen TV dinners, limited red meat consumption, chemicals used as additives or preservatives, hot dogs, candy, sweetened breakfast cereals, ice cream.
- 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 -

- Sustainable Energy Progress Worldwide in 2023 - was excellent, despite what the media is saying. More than 440 GW was added, with clean energy often being the least expensive choice, and more is on the way. Grid investment increased, and much more is in the works (slow work). [Details](#).
 - Solar Leads - with China, Europe and the US setting records. China added about 200 GW, Europe 58 GW, and the price of solar panels in Europe was cut in half (record low). More than 60 solar panel manufacturing starts were announced for the US in 2023, thanks in part to state and federal incentives like the US Inflation Reduction Act (IRA).
 - Wind - On a world-wide basis energy for about 80 million homes was added, with China alone adding about 60 GW. Some land based projects have been delayed until 2024-5

for permitting, grid and other issues, but wind power for about 2.3 million homes was added in the US. Two offshore projects began producing power in the US, with more expected next year (some delays there). China, the US and Germany lead on land-based wind, with China, the UK and Germany leading on off-shore wind.

- Batteries - 1 in 5 new cars sold world-wide were EVs (lots of batteries), with more than \$43.3 billion being spent on battery manufacturing and recycling in the US alone (thanks IRA). The US and Europe had 38 gigafactories (big battery factories) in the works, but China still leads with 295 battery factory start-ups!
- To-Do List - battery materials, supply chain issues, grid connect issues, EV charging infrastructure.
- Renewable Power Reaches 55% in Germany - offshore wind 31.1%, solar 12.1%, biomass 8.4%, with 3.4% from hydropower and other renewables - according to the Bundesnetzagentur. Germany has no nuclear plants.
- Fossil Fuel Power Lowest in UK Since 1957 - Fossil fuels 33%, renewables 43%, with the remainder being nuclear power and imported electricity - according to [CarbonBrief](#). [Background](#).
- No Lettuce This Winter For Florida's Mosquito Lagoon Manatees - Based on seagrass monitoring in the lagoon, the Florida Fish and Wildlife Service has [determined](#) that sufficient seagrass has returned to prevent a repeat of last winter's mass manatee starvation event - so no [emergency feeding of 400,000 pounds of lettuce](#) this winter. The seagrass dieoff was caused by excessive fertilizer runoff in the watershed. With no word on correcting this, the permanent recovery of seagrass in the lagoon is doubtful. [John D. and Norma K.]
- Whales and Off-Shore Wind Farms - **No**, there is no credible (peer reviewed publication) information that whale deaths occurring off the US East coast are due to the few wind farms there presently. The US National Oceanic and Atmospheric Administration reported that [40% of recovered whale carcasses had evidence of death from fishing gear or ship strikes](#). See the NOAA numbers for the North Atlantic Right Whale, [here](#).
- The Aral Sea Was Once The World's Fourth Largest Lake - See the before and after 2000-2018 satellite photos [here](#). The Aral Sea lies on the border between Kazakhstan and Uzbekistan. Due to [excessive withdrawal of irrigation water](#), most of the Aral has disappeared, releasing more than 110 million tons of dust and toxics annually from the dry salt flats left behind. When it's all gone ... ?
- Salton Sea Lithium Deposits - A recent Department of Energy [report](#) concludes that there is enough Lithium at this southern California site to create [batteries for 375 million EVs](#), and that it may have the highest concentration of lithium contained in geothermal brines in the world. Several companies are planning extraction plants. Post-extraction water would be reinjected.
- Why is the Quinoa Plant Resistant to Drought and Salt Water? - For decades we thought it was [because of the tiny water balloons](#) that form on them, but a new study has shown that those actually ward off pests and bacteria. So now that we know that's *not* why the quinoa plant is drought resistant, we can go back to figuring out *how* it does that - with the hope that we can transfer that ability to other food plants. A definitive step backward can be a step forward. [Publication](#).
- Self-Healing Concrete Using Bacteria Infused Polymer - [Drexel University engineers](#) have developed a new polymer '[BioFiber](#)' incorporating a bacteria-infused hydrogel (*Lysinibacillus sphaericus* in spore form), all within a damage-responsive 0.5 mm casing. The BioFiber is arranged in layers of grid patterns as concrete is poured. When the concrete cracks and admits water, the bacteria activate and generate calcium carbonate to seal the cracks and extend the

life of the concrete. Lengthening the lifespan of concrete would reduce the generation of greenhouse gasses substantially. Elegant! [JD W.]

- [Unexpected Use for Chicken Feathers](#) - Scientists at ETH Zurich and Nanyang Technological University Singapore have discovered that the [keratin in chicken feathers](#) can be used in the manufacture of the separation membrane in Hydrogen fuel cells, the key component of this important Carbon free energy generator. The new method is three times cheaper than the current method using toxic 'forever' chemicals. A massive amount of unused chicken feathers are currently being burned, or buried in landfills.
- [New Jersey Power Grid Upgrade](#) - The \$935 million 'EnergizeNJ' plan will take 5 years to implement, will benefit 1 million power users in northern and central New Jersey, will replace 650 miles of underground and overhead cables, and will update 18 substations. [Details](#).
- [New Power Line Connects Italian/Austrian Grids](#) - The 220 kV, 17 mile, \$186 million line will allow two-way transfer of power over the [Reschen Pass](#) (crosses the Alps at 4,900 feet). This will double import capacity to 300 MW - hydropower in Austria, wind and photovoltaics in Italy.
- [Greece-Cyprus Subsea Power Line](#) - Cyprus is the only remaining member of the EU with no interconnection to the EU grid, but a [\\$2.1 billion project](#) is now in the works to fix that. Cyprus and Greece have some of the highest potential for renewable energy in the EU for both solar and onshore and offshore wind power generation. By 2030 Greece expects to have 2 GW of offshore wind power.
- [California-Idaho Power Line](#) - This newly approved [285 mile power line](#) will allow CA to export 500 MW of solar power to ID, and [import 1,000 MW of ID wind power into CA](#) (map), strengthening and improving the resiliency of both grids. The Southwest Intertie Project-North project is expected to cost \$1 billion.
- [Largest Clean Energy Project in US History](#) - has closed on financing at \$11 billion, and construction has begun! SunZia *Wind* is a huge 3,500 MW wind farm in the New Mexico counties of Torrance, Lincoln, and San Miguel. SunZia *Transmission* is a 550 mile, 524 kV transmission line connecting SunZia Wind to Arizona and on to energy hungry southern California (power to fill the gap after CA solar sources go dark). Wind turbine company [Vestas](#) (Aarhus Denmark) will supply 242 4.5 MW turbines for SunZia Wind - delivery begins 1Q25, commissioning begins 1H26. Big!!
- [Montana Wind Project - Clearwater Wind Project](#) will generate 775 MW of wind energy from GE wind turbines located in Rosebud, Custer and Garfield Counties, Montana. The first phase at 365 MW is already operational. Montana now has [more wind power generating capacity than from coal](#) for the first time in history. [Louise F.]
- [US Solar Industry](#) - is expected to install [32 GW of solar power in 2023 \(up 52% from 2022\)](#), much of it in utility scale solar farms. The leading US producer of solar panels for utility scale projects is [First Solar](#) (Tempe AZ). The company uses a thin film technology (no Silicone), with a supply chain sourced in the US - and therefore qualified for credits under the federal Inflation Reduction Act.
- [Solar Parking Lot Canopies in New York City - NYC has changed its zoning laws](#) to open up 8,500 acres of parking lots for solar canopies, including battery storage and EV charge stations [planning board [video](#)]. This will greatly streamline the otherwise complex permitting process. Yes indeed!
- [Florida Power and Light 'Ibis' Solar Center](#) - is a new 75 MW solar plant (power for 15,000 homes), and has more than 200,00 solar panels on a 600 acre site in southern Brevard County FL near the city of Palm Bay. The plant is expected to go on line in January. This is the fifth solar facility in Brevard County, each one costing about \$100 million to build. The panels at Ibis track the sun, and can also absorb light from the back side, when light bounces off the ground.

- [Florida's First Floating Solar Farm](#) - is a pilot project installed by Duke Energy on the surface of a cooling pond (former phosphate mining pit) in Polk County FL - Duke Energy [Hines Energy Complex](#) in Bartow, southeast of Lakeland FL. 1 MW, 1,800 bifacial panels, power for 100 homes, constructed and connected in 6 months.
- [Largest Floating Solar Farm In the Southeast US](#) - Duke Energy and the US Army have partnered to install a [floating solar farm on Big Muddy Lake at Camp Mackall, Fort Bragg](#) North Carolina - 1.1 MW, with 2 MW of storage outputting at 2 MW. The Department of Defense accounts for nearly 80% of the federal government's fuel consumption.
- [Floating Off-Shore Solar Farms](#) - Solar Duck (Netherlands) will start construction (Summer of 2024) on a [demonstration project named 'Merganser'](#) in the Dutch 'North Sea Farmers Test Site' off-shore from the Hague. Merganser will have 6 platforms measuring 65 meters in diameter, with a power output of 0.5 MW. [Future projects](#) being planned are: a 5MW project at the Hollandse Kust West VII offshore wind park in the Netherlands (North Sea), Japan's Tokyo Bay, and a project with TNB Renewables in Malaysia.
- [Large Solar Farm in Cornwall \(UK\)](#) - Over objections to the loss of farmland, local authorities narrowly approved a [205 acre solar farm](#) rated to produce enough power for 19,000 homes.
- [New Hampshire Seeks EPA Solar Grant](#) - The NH Department of Energy has requested a \$70million grant under EPA's 'Solar for All' competitive grant program, derived from the 2022 Inflation Reduction Act. The state would use the grant to fund community solar projects, and to increase access to solar for people living in low-income and disadvantaged communities. NH has a small [existing program](#), but has lacked funding. [Details](#).
- [New Modular Nuclear Reactor Design](#) - The 'Hermes' modular reactor design ([Kairos Power](#), Alameda CA) uses a fuel pebble bed design with a molten fluoride salt coolant. This first pilot reactor is expected to achieve a thermal power level of 35 megawatts, and be operational early in 2026. The [NRC](#) recently gave construction approval, and the reactor will be built in Oak Ridge Tennessee. [Ron and Rachel M]
- [A Box of Hot Rocks](#) - is an [efficient way of storing the otherwise transient output of solar/wind farms](#), particularly if the heat can be used directly by an industrial process requiring high heat - avoids conversion inefficiencies/losses, can be modularized to fit the user's needs. See a description of the technology being offered by [Antora Energy](#). (Sunnyvale CA). The company has now received [grants](#) from California and the US Department of Energy to scale up its prototypes for commercial use. Elegant simplicity! Stay tuned.
- [US Treasury Rules for Clean Energy Tax Credits](#) - [Details](#). The rules for claiming clean energy manufacturing tax credits under the Inflation Reduction Act are out for a 60 day comment period before being finalized.
- [Pennsylvania Natural Gas Power Plant Cancelled](#) - The Allegheny Energy Center proposed for [Elizabeth Township](#) PA, and long opposed by [environmental groups](#), has been cancelled. [Details](#). [Phil J.]

Other Science News -

- [Latvian Led Drone Coalition](#) - Latvia will coordinate drone [assistance to Ukraine](#), and Norway has announced that it will be donating NASAMS (National Advanced Surface-to-Air Missile Systems) air defense systems valued at approximately \$30.6 million - prompt deployment for use this Winter is expected.
- [Ukraine's AQ-400 Scythe Drones](#) - Where its at for this design is striking far away, cheaply. The Scythe production goal is constructing 1,000 drones monthly by the end of 2024. Specs: forward and rear wings, launched from its own tricycle gear from short strips or by catapult, wingspan

7.5 feet, takeoff weight 220 pounds, gasoline engine with rear prop, 94 pound payload, 94 mph cruising speed, 6.5 hours endurance, range 456-559 miles, \$15,000-30,000 depending on configuration, **made of plywood**. [Details](#) [video].

- [Ukrainian 'Sea Baby' Drones](#) - otherwise known as Uncrewed Surface Vessels (USV), are now being [armed with rocket launchers](#); they had already been armed with flame throwers. Ukraine says they intend to diversify and coordinate the variously [equipped](#) USVs to perform the function of a warship in dispersed form: attack, defense, anti-aircraft, surveillance, kamikaze, submarine attack/defense, etc. This is a new approach to naval warfare, permitting rapid innovation and flexible deployment at low cost. Potent.
- [Ukraine Shoots Down Three SU-34 Bombers](#) - The \$50 million Russian planes were shot down over the Kherson region of Ukraine, probably by Patriot missiles - reportedly while launching [glide bombs](#). [Photo](#).
- [Blue US Postal Service Mailbox Upgrade](#) - There have been [25,000 thefts from blue boxes](#) in the first half of 2023. 10,000 new high security boxes have already been installed - they look just the same. [Betty M-L.]

[Nice Thing](#) - [skip ad, full screen]

The physical vocabulary of dance - [here](#).