

Science Report Highlights

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

- Macular Degeneration
- Health Role of Vitamin D
- Solar *on* Houses of Worship/other non-profits –direct pay from IRS
- Microplastics in Protein Food Sources
- Small, Bladeless, Quiet Wind Turbines
- Japanese Moon Lander SLIM
- Odysseus Has Launched Successfully – scheduled to touch down on the Moon

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).

- [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 -

- [First Medication for Severe Frostbite](#) - FDA has [approved](#) Aurlumyn (iloprost), manufactured by [Eicos Sciences \(Chevy Chase Maryland\)](#), subsidiary of CiVi Biopharma in California) for the treatment of severe [frostbite](#). It was highly effective in preventing the need for amputation, a first. [Background](#).
- [RSV](#) - CDC advice on recognizing the symptoms of RSV, [here](#). Prevention by vaccination is best.
- [AI Diagnosis of Fatty Liver Disease \(FLD\)](#) - FDA has cleared 'HealthFLD', an artificial intelligence (AI) software package providing automated qualitative *and* quantitative analysis of liver attenuation based on *routine* contrast and non-contrast chest and abdomen CT scans. About [24% of US adults are living with FLD](#), a metabolic spectrum disease linked to obesity, cardiovascular disease and type 2 diabetes - many undiagnosed because of the required costly/invasive liver biopsy. This invention presents the opportunity for more routine screening. Manufactured by Nanox AI Ltd, subsidiary of Nano-X Imaging (Petach Tikva, Israel). [Publication](#). Two other *previously* FDA cleared AI software packages from Nanox AI: [HealthCCSng](#) - detects coronary artery calcium, a risk for coronary artery disease; [HealthOST](#) - assesses vertebral compression fractures and bone mineral density for evaluation and assessment of musculoskeletal disease of the spine (such as osteoporosis).

Other Health Science News -

- Macular Degeneration - Causes a loss of central vision, can be of the more common dry form or the more serious wet form, has life-style and dietary causes, and is increasingly common with age. Routine eye exams can catch the issue before irreversible damage is done. [Details](#). Nutrition should include: antioxidant rich fruits and vegetables, Omega-3 rich fish and walnuts.
- Heart Disease - is the [leading cause of death](#) in the US. [Avoiding these 3 foods](#) reduces your risk. Summary: bacon, white bread, french fries.
- Drug Spacecraft Will Land in Utah - on the US Air Force Utah Test and Training Range. The drug manufacturing start-up [Varda](#) Space Industries (El Segundo CA) has manufactured several pounds of a drug under zero gravity conditions, and will recover it for evaluation when its W-1 mission returns. Photo/details [here](#).
- 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 -

- Are Macadamia Nuts Healthy? - Short answer, yes in moderation. See the nutritional details [here](#). See a more general article about the nutritional and health benefits of several kinds of nuts, [here](#). Good antioxidants.
- Is Passion Fruit Healthy? - A registered dietician says yes, explains why, lists the health benefits, and gives a nutritional run-down, [here](#).
- Is Butternut Squash Healthy? - A registered dietician lays out the nutritional analysis, and explains the health benefits, [here](#).
- 10 Benefits of Tart Cherry Juice - are described by a registered dietician, [here](#). Use the concentrated form found in the refrigerated case at the grocery. It is rich in antioxidants, is a tasty topping for fresh fruit and orange sections (makes the nutritious orange peel more edible), and may help you sleep.
- 9 Best Berries for Health - as recommended by a registered dietician, [here](#). [Antioxidants](#), [fiber](#), anthocyanins, [folate](#), polyphenols, [zeaxanthin](#), several essential minerals and Vitamins A/C/K. Note: frozen berries are even more nutritious than fresh because freezing breaks open the cell walls in the skin of the berry (most nutritious part), and makes their nutrients more accessible to your gut microbiome. *Wild* frozen blueberries are the most nutritious. Cooking reduces nutritional value, especially antioxidants.
- Purple Vs. Golden Raisins - [Both are nutritious](#), having fiber and antioxidants, and both are high in sugar (moderation please). Purple raisins are sun-dried, and more caramelized. When looking for golden raisins, sometimes also called Sultanas, look for the term 'natural', meaning not treated with preservative sulfites. When using Sultanas for baking, soak them for 30 minutes to plump them.
- 8 Anti-Inflammatory/Antioxidant Staples - that a registered dietician recommends keeping on hand for routine use, and why, here. Summary: extra virgin olive oil, tumeric, canned tuna, kidney beans, almonds/walnuts, canned tomatoes, garlic, green tea.
- Health Role of Vitamin D - It is an important antioxidant, and helps maintain the body's anti-inflammatory balance. [Details](#). Note: above the latitude of Charlotte NC there isn't enough UV-B in sunlight in the Winter for the body to make its own Vitamin D, so food/supplements must provide it.
- 15 Best Fruits and Vegetables for Weight Loss - [here](#). Yes, blueberries head the list. Tune-ups: a good bit of the nutrient value of fruits and vegetables is in the skin or rind. Scrub, but don't

peel, potatoes and summer squash like zucchini and yellow squash. Scrub and eat (chew thoroughly, maybe top with tart cherry concentrate) at least part of the rind of citrus fruits like oranges (especially blood oranges and Cara Cars navel oranges), and lemons (especially Myers lemons). Frozen berries/fruit is as nutritious as fresh. When eating spinach, use baby spinach for raw applications and mature spinach for cooking. For squash ([Figure 1 in this study](#)), note the difference for weight loss between 1) [Summer Squash](#) - straight neck squash (yellow) and zucchini - nutritious *and* good for weight loss, 2) [Winter Squash](#) - acorn/butternut/spaghetti squash - also nutritious, but *not* as good for weight loss.

- [Worst Food for Visceral Fat](#) - is cheese, unfortunately. [Most of the calories in cheese come from its fat](#), not from its protein - but if you must have your fix of cheese occasionally, choose low fat or nonfat versions of cheese like mozzarella or ricotta or [Jarlsberg Lite](#). Low fat cottage cheese is also good, and high in protein. For flavor, maybe a bit of grated parmesan sprinkled on top of something hot to melt it. Moderation.
- [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 -

- [GSA and DoD Propose to Buy More Carbon-Free Energy](#) - The General Services Agency (GSA) and the Department of Defense (DoD) are [proposing to buy](#) an additional 2.7 million MWh of [carbon free electricity](#) annually to power their facilities in the 13 mid-Western and mid-Atlantic states comprising the PMJ electrical grid ([map](#), includes the DMV) - the purchases to take place this Spring and Summer. That's enough energy to power 250,000 homes. This is progress on complying with a 2021 Presidential Executive Order for federal agencies to be carbon free by 2030. GSA already has agreements to move from 38% to 47%. Well done GSA!
- [EPA and DOE Grants for Methane Leak Abatement](#) - from the oil and natural gas sectors will be funded from the 2022 Inflation Reduction Act. See a description of the three areas the grants will be focused on, [here](#).
- [Beavers Again in the Cairngorms](#) - For the first time in 400 years there will now be [beavers in the Cairngorms](#) National Park in Scotland, due to a program to reintroduce them in what was a part of their traditional range. The upper River Spey in the Cairngorms represents the fifth catchment in Scotland to which beavers have either been reintroduced or allowed to stay. The others are: Tayside, on the Forth, in Knapdale and Loch Lomond.
- [Great Horned Owl Rescued](#) - [here](#).
- [Black Labs Rescued](#) - Two black labrador retrievers were trapped together in an icy pond in Ft. Wayne Indiana. See their story, and their rescue, [here](#). [Karen and Mack W.]
- [Solar on US Public Lands](#) - The US Bureau of Land Management plans to entertain proposals for solar energy production within [22 million acres of public land](#) (larger than Scotland) in 11 western US states, favoring those areas near electrical transmission lines - only 700,000 acres are needed to meet 2035 US clean energy goals. See examples of the dual role solar can play, both in producing clean power, and in restoring habitat for plants, pollinating insects and small animals, [here](#).
- [Solar on Nevada Nuclear Security Site \(NNSS\)](#) - In 2023 the Department of Energy's National Nuclear Security Agency (DOE NNSA) issued a Request for Information ([RFI](#)) to solicit interest in

the commercial development of solar farms on a contiguous 2,000 acre portion of the NNSS in Nye County Nevada. Nuclear [bomb tests](#) were conducted at the NNSS from the 1950s to the 1990s. By the January 12, 2024 RFI deadline there were 6 responses. DOE will next get to the Request for Qualifications (RFI) stage, to decide which of the 6 are suitable - and then ... eventually ... on to the Request for Proposal stage (RFP). "The mills of the gods grind slowly, but exceeding fine" - Sextus Empiricus, *circa* 300 CE.

- [Solar on Houses of Worship](#) - The US 2022 Inflation Reduction Act (IRA) includes a [tax credit](#) feature, also called [direct pay](#), that **benefits tax exempt religious and governmental institutions** installing solar power panels - covers solar, wind, storage, community solar, EV charging infrastructure, etc. Up to [30% of the initial investment can be recovered in a direct payment](#). Be thankful.
- [Geothermal Energy Policy in the EU](#) - On 1/18/2024, by a vote of 531 to 2 (!!), the European Parliament [resolved to speed the development of geothermal sources of energy in the EU](#). Europe has significant geothermal resources in geologic basins beneath Paris, the [Munich Molasse](#), North Germany and the Upper Rhine Graben regions. A European Commission renewables strategy put forward in May 2022 called for a tripling of the volume of total EU energy demand covered by geothermal by 2030 - from not much (0.2 % of electrical power), to not much more. Italy is the front runner so far, and 20% of all homes (32,000) in Aarhus, Denmark will soon be powered by geothermal. Time to move! The Greens will like it, once they've argued about it sufficiently. [Sonja B, Hugo DLH G.]
- [DOE Grants for Geothermal Projects](#) - The US Department of Energy has provided [\\$60 million from the US 2021 Infrastructure Act](#) for three projects to demonstrate the efficacy and scalability of enhanced geothermal systems (EGS) - DOE's [Geothermal Shot Initiative](#). The goal is to reduce the cost of EGS energy by 90%. Ambitious. Thank you for the kick-start, Secretary Granholm.
- [Wind Energy in Ireland](#) - The 'Wind Energy Ireland [Annual Report](#)' has the following wind news: wind provided 35% of Ireland and Northern Ireland's electricity in 2023 (13.7 GWh, power for 3 million homes), saved \$999 million on natural gas not burned, saved \$390 million on Carbon credits not used, \$238 million more was saved not burning natural gas in Northern Ireland, 4.2 million tons of Carbon weren't generated (equivalent to Carbon output of 1.9 million cars). More Irish wind capacity is on the way.
- [World's First Semi-Submersible Off-Shore Wind Farm](#) - The [WindFloat Atlantic](#) has been in operation for 3 years now, located off-shore of Porto Portugal, and survived its first major hurricane last November - [wave heights up to 66 feet, wind speeds up to 86 MPH](#). The three 8.4 MW wind turbines sit on semi-submersible, three-column [floating platforms](#) anchored by chains to the seabed, and a 12.4 mile-long cable connects them to a substation on land. Produced 80 GWh in 2023.
- [New Jersey Off-Shore Wind Energy](#) - The two NJ off-shore wind projects that were cancelled last Fall have now been replaced with [two new wind projects](#), '[Leading Light Wind](#)' and '[Attentive Energy Two](#)', that will be further off-shore than the cancelled projects and not visible from land. Attentive Energy said that its project [Attentive Energy Two](#) (map) will be 42 miles off-shore - [Leading Light Wind](#) (map) will be 40 miles off-shore. The two projects together will generate power sufficient for 1.8 million homes. [Betsy B.]
- [Maryland Off-Shore Wind](#) - [Ørsted](#) (Fredericia Denmark), the developer of Skipjack 1 and 2, planned for two adjacent sites off-shore of the Delmarva Peninsula, [has stepped back](#) from its tentative power off-take agreement with the Maryland Public Service Commission to provide 966 MW to the Maryland power grid. The company says it intends to continue advancing development and permitting, including submission of construction and operations plans to the

US Bureau of Ocean Energy Management. A renegotiation of commercial terms is expected. Stay tuned. [Map](#).

- [Vineyard Wind](#) - The first of 62 turbines from this wind farm 15 miles off-shore of Martha's Vineyard [has begun returning power](#) to Cape Cod at the rate of 5 MW. When the project is fully operational it will produce enough power for 400,000 homes, [details](#).
- [Green Hydrogen from Wind in Uzbekistan](#) - Ground has been broken on the largest such project in the region. The plant is designed to produce 3,000 tons of green Hydrogen annually, manufacturing 500,000 tons of ammonia fertilizer, and eliminating the need for 1.1 billion cubic feet of polluting natural gas.
- [Wind and Solar Power to Pass Coal in China in 2024](#) - Wind and solar will generate 40% of power in China by the end of 2024. Consider the *size* of that undertaking! [Details](#).
- [Small, Bladeless, Quiet Wind Turbines](#) - that can be placed along the roof-edges of commercial buildings to complement solar panels placed in the middle of the roof, [here](#). The company is [Aeromine Technologies](#) (Copenhagen Denmark), and the product is the 'Aeromine'. No towering mast, no gigantic blades, no Whomp Whomp, no dead birds. US locations in California and Texas, [here](#).
- [Gravity Battery in Decommissioned Copper Mine](#) - The Scottish company [Gravitricity](#) (Edinburgh UK) has signed an agreement with the Finnish community of Pyhäjärvi (280 miles north of Helsinki) to install a gravity battery in its 4,600 foot deep decommissioned Pyhäsalmi Copper mine. The project's 2 MW capacity will be connected to the mine's existing substation, avoiding delay and cost. Other existing mine infrastructure will also be reused. [Details/photos](#). A gravity battery is an energy storage system that stores/returns energy by raising/lowering weights respectively.
- [New Energy Economy Project](#) - has received a [\\$10 million grant funded by the US 2001 Bipartisan Infrastructure Act](#). The grant was awarded last Fall, and is intended to provide the training, technical assistance, supply chain mapping and guidance for factory and product upgrades needed by small/medium-sized companies to enter into the emerging clean energy economy. The **focus is Appalachia** - 156 counties in Ohio, Pennsylvania, West Virginia, Maryland, and New York. Opportunity knocks.
- [Microplastics in Protein Food Sources](#) - A recent study found [microplastics in 90% of the samples](#) of more than a dozen different types of proteins, including seafood, pork, chicken, beef, and tofu. Highly processed protein had more ... chicken breasts, pork loin chops, and tofu had the least. The average adult in the US consumes about 11,000 pieces of microplastic annually. What that means for human health is still unknown. Microplastics are also affecting [silt transport](#) in rivers. Since they are lighter than the silt and sand in river beds, they coat the bottoms and sides of the riverbeds, and cause silt to move downstream more quickly. Nano plastics in bottled drinking water, [here](#).
- [Microplastics in Bottled Water](#) - A [study](#) done by researchers at Columbia University using a Stimulated Raman Scattering technique showed that three brands of bottled water had from 10 to 100 times more microplastic particles than previously thought - Fourier Transform Infrared Spectroscopy (FTIR) and Raman microscopy lack the necessary resolution/detection sensitivity ... Electron Microscopy and Atomic Force Microscopy lack the needed *chemical* specificity The study showed that one liter of bottled water typically contained 240,000 plastic particles - 10% microplastics (1 μ to 5 mm), 90% nanoplastics (<1 μ). [Details](#). Toxicity unknown, but not good.
- [Gene-Tailored Bacteria Convert Waste Plastic](#) - to a spider dragline-inspired silk protein with almost the tensile strength of steel, at one-sixth its density. Think Wonder Woman's '[Lariat of Truth](#)'. Imagine what could be done with thread, yarn, or rope made of that material, and then

think of all the waste plastic that could be repurposed. The [process](#) discovered by [researchers at Rensselaer Institute](#) is [low energy, and needs no toxic chemicals](#).

Other Science News -

- [Japanese Moon Lander SLIM](#) - Japan's 'Smart Lander for Investigating the Moon' (SLIM) made a [successful soft landing](#) on the moon, has regained solar power generation after landing on target but [upside down](#), and has now begun to return multispectrum data from its specialized camera. Spills, thrills .. and success! Congratulations [JAXA](#).
- [Odysseus Has Launched Successfully - Intuitive Machines](#) (Houston TX) aims to put the [first commercially built spacecraft on the lunar surface](#) - scheduled to touch down on the Moon's South Pole in about a week. [Update](#).
- [Airport Terminal Upgrades](#) - The US Department Of Transportation will provide \$970 million in grants from the US 2021 Infrastructure Act to upgrade 144 airports - [list](#). [Maryland will receive \\$15 million to replace 14 boarding bridges at BWI airport, and to construct a new air traffic control tower at Martin State Airport](#) in Middle River. Dulles International Airport in Virginia will receive \$35 million for upgrades. Thanks Secretary Buttigieg.
- [High Bandwidth Memory \(HBM\) Chip Packaging Plant Coming to Indiana](#) - South Korean chip company SK Hynix is planning a [factory in Indiana to package its HBM chips](#) with the chips of companies like Nvidia to produce the graphics processing units (GPU) basic to AI. Funding would come from the \$22 billion US investment plan the company announced in 2022. On-shoring chip packaging would close a critical gap in the US-based GPU supply chain for AI components.
- [Turkish Drone Factory in Ukraine](#) - Turkish-designed [Bayraktar drones will be built in the new facility](#) now under construction, to be operational within 2 years. Some Ukrainian parts will be used. TB2 [specs](#): Speed 138 mph, payload 330 pounds, loitering time 27 hours, range 2,200 miles, altitude 18,000 feet, can launch laser-guided bombs. It's still unclear whether the [TB2](#) or [TB 3](#) (jet) model will be [built there](#).
- [F-16 \(Viper\) Jets Praised by Ukrainian Pilots](#) - The [Netherlands, Denmark and Norway](#) are **giving** Ukraine about 60 F-16 jets from their own inventory - no US funds required. That generous gift will essentially replace Ukraine's outdated Soviet era air force of SU-27s and MIG-19s with [NATO standard](#) equipment that [can mount NATO standard air-to-air and air-to-ground](#) weapons - [AGM-88 HARM \(anti-radar\)](#), AIM-120 AMRAAM (air-to-air), 2,000 pound [bombs](#)). Ukrainian F-16 pilots (and maintenance technicians) have been training in the [UK](#) since August, in the US since October, and recently in Denmark since December. Operations in Ukraine are set to start in the coming months. Some pilots are reported to have completed their training in 3 months, one quarter of the time usually allocated to train US pilots. First use of the F-16 will probably be as a weapons platform at stand-off range. "Needs must, when the devil drives" - Shakespeare, *All's Well That Ends Well*
- [Russian Ship Sunk Off Crimea](#) - Ukraine reports that the Ropucha-class amphibious ship Caesar Kunikov was [sunk South of Yalta](#) [video, [map](#)] by Ukrainian [Magura V5 sea drones](#). The [Caesar Kunikov](#): Project 775 large landing ship, crew of 87, has been active in Syria, Georgia, and Ukraine - rescue results unknown.
- [Russian Zircon Hypersonic Missile](#) - has been [used for the first time against Ukraine](#). The [3M22 Zircon](#) is an air breathing scramjet cruise missile with a range of 625 miles, and a top speed of Mach 9

Nice Thing - [skip ads, full screen]

- Church Picnic (Country Style) - *All Day Singin' and Dinner on the Ground*, [here](#).
- Funeral Oration for Muhammad Ali - Billy Crystal, [here](#).