

Science Report Highlights

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

- Viruses Linked to Alzheimer's Disease (AD) and Dementia
- Contraceptive Pill for Men
- Are Eggs Healthy?
- Carrots - are good, but *Baby Carrots* are fake
- Northeast Boundary Tunnel (NEBT) – District stormwater runoff diversion tunnel
- 67 Ancient Skeletons Discovered near Rome, Italy

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.

- Viruses Linked to Alzheimer's Disease (AD) and Dementia - Researchers in Finland and the UK, using very large patient databases, have associated certain pathogenic viruses with an increased risk of AD and dementia. See the list [here](#). They also concluded that being vaccinated against these viruses probably lowered the risk.
- 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 -

- Immune Checkpoint Inhibitors to Treat Malignant Tumors - Immunotherapy has made great progress, but there is limited medical consensus on when it is appropriate to discontinue it, or switch to alternate or hybrid treatment. See a decision tree flow chart based on a recent survey of the literature, [here](#).
- Beta-Thalassemia - FDA has approved the [Vertex](#) Pharmaceuticals (Boston MA) medication [Casgevy](#), a gene therapy, for transfusion-dependent beta-thalassemia, an inherited disorder characterized by life-long anemia requiring frequent blood transfusions. Casgevy had [previously been approved](#) for sickle cell disease.

Other Health Science News -

- Contraceptive Pill for Men - Researchers at the [University of Dundee](#) in the UK are showing promising results at the *in vitro* lab test stage for a non-hormonal pill that would have few to no side effects on men, could become effective in a few hours, and reversed in a few hours. [The pill operates by slowing down sperm swimming activity](#). This may take a few years to develop.
- Multivitamins? - Summary: only with your doctor's advice, and only those certified by a third party such as USP. A registered dietician recommends **prioritizing** a healthy, balanced nutritional plan of whole natural foods that emphasizes: an abundance of plants from all sources, grains from a variety of sources, beans, nuts, seeds, as well as animal proteins such as

fatty fish (Salmon, Mackerel - canned or frozen OK), and a limited amount of low fat dairy. [Details](#).

- [Over-The-Counter Hearing Assist Devices](#) - FDA approved OTC sales some time ago, so [why isn't the public more interested](#). One doctor suggested that "public interest in hearing health could ultimately be driven less by the medical community and more by technology companies wanting to boost consumer awareness of their audio products'. Think iPods. About one in five adults in the US are said to be struggling with hearing loss.
- [5 Tips for Keeping Your Brain Healthy](#) - [here](#).
- [20 Ways to Lose Weight After 50](#) - as described by a registered dietician [here](#). Tune-up: Use natural whole foods, no supplements unless recommended by your doctor.
- [New Weight Control Drug](#) - In November FDA approved Zepbound, an Eli Lilly medication indicated for patients with certain weight related conditions. In the 88 weeks of the underlying human trial, participants lost an average of 26% of their body weight - more than other weight control medications. [Details](#). Lifestyle methods, including regular exercise and nutritional improvements using natural foods, are usually best for weight control.
- [Anthrobots for Wound Healing](#) - [Scientists at Tufts University](#) have used human tracheal cells to create tiny biological robots (biobots) with cilia that can move them across areas of neuronal damage and encourage neuronal growth for self-repair. This presents the prospect of creating biobots from a patient's own cells to use as tools for regeneration, healing, and treatment of disease. Currently a lab experiment. [Publication](#).
- [Cholesterol Levels](#) - Check the LDL and HDL cholesterol levels for your age and gender in these [tables](#). Get tested annually, and ask your doctor to advise about bringing your numbers into the safe zone.
- [A Vaccine for Lowering LDL Cholesterol](#) - is [under development](#) by researchers at the University of New Mexico and University of California Davis, and shows promise for lowering LDL cholesterol by as much as 30%. The next step is testing in humans. Yes indeed! [Publication](#).
- [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 -

- [Bone Broth \(Based on Roasted Chicken\)](#) - See why nutritionists recommend it, [here](#). It has a lot of otherwise hard to get collagen that is good for the skin microbiome and reduces inflammation, while being low in calories and very low in carbs, sugar and fat. It also has Potassium, and a lot of protein that helps suppress appetite for weight control. Watch the Sodium - if used in cooking, add little or no salt. Buy ready to go at the grocery.
- [Is Oatmeal Healthy](#) - Yes, if you pay attention to what you add. [Details](#).
- [Are Tortillas Healthy?](#) - A registered dietician says [yes to corn tortillas](#), and no to flour tortillas (twice the carbs). The dry corn that goes into corn tortillas is considered a whole grain - good [fiber](#) and high nutrient density. Read the nutritional label and contents carefully - should have corn, salt, water and not much else.
- [Are Eggs Healthy?](#) - The first thing to know is that dietary [cholesterol](#) does not necessarily affect blood cholesterol - the one that counts. The second factor is avoiding using unhealthy cooking oils - butter, bacon fat, ultra processed oils - use avocado oil or a mildly flavored olive oil. Having dodged cholesterol, and ducked the bad-oil bullet, eggs *are* a [healthy nutrient powerhouse](#) - riboflavin, iron, zin, phosphorus, folate, choline, vitamins A/D/E and

antioxidants. Tune-up: use low Sodium salt, avoid the traditional [fatty or highly processed meats](#).

- [Carrots](#) - are good, but **Baby Carrots are fake**. They are actually a [shaved down form or large carrots](#), they dry out more readily without their peel, and the carrots they are made from are [less flavorful](#). Baby carrots are twice the cost of standard carrots, and accounted for more than half of the carrots sold in the U.S. in 2019. Lose lose
- [What to Leave out of Your Berry Smoothie](#) - Bananas. [Recent research](#) suggests that they may neutralize the antioxidants in the berries if they are mixed together, or eaten close together in time. Both are fine eaten well separated in time. [Publication](#).
- [8 Best Foods for Healthy Hair](#) - See a registered dietician's recommendations [here](#), and why. Summary: Eggs, strawberries, salmon, almonds, avocado, leafy greens, lentils. other protein-rich choices.
- [14 DASH Diet Breakfasts](#) - recommended by a registered dietician, [here](#). Dietary Approaches to Stop Hypertension ([DASH](#)). The Mayo Clinic view of the DASH diet, [here](#).
- [7 Health Benefits From Reducing Sugar](#) - Details from a Registered Dietician [here](#). The two general sources of sugar in human food are *naturally occurring sugar* in foods like fruit/milk/vegetables, and **added sugar** - the refined sugar added to processed/prepared foods and drinks. Scientifically it would be healthiest to cut out all *added* sugar (sugar detox), but [minimizing will do](#). Summary of *added* sugar reduction benefits: 1) Weight management, 2) Regulate blood sugar, 3) Heart health, 4) Oral health, 5) Reduces risk of depression, 6) Improve skin health, 7) Reduces risk of liver disease. **Get tested for blood sugar**, and get your doctor's advice, before big changes.
- [Sugar Sweetened Drinks \(Sodas\)](#) - make up [25% of the added sugar in the average US diet](#). Too much added sugar leads to type-2 diabetes, obesity and a spectrum of cardiometabolic diseases. Five US cities put added-sugar taxes on sodas, and a [study](#) of the results showed a reduction by one third in their purchase. Action item for state and local governments in the DMV?
- [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 -

- [Wind and Solar Energy in Indiana](#) - Coal produced about 80% of Indiana's energy in 2010, but that dropped to under 50% by 2022. Indiana now has about 3,500 megawatts of wind, and more than 400 megawatts of utility-scale solar, with 9,000 MW scheduled to come on line by 2028. See a description of the siting issues that are being encountered, and the efforts by the Nature Conservancy and others to ease the way, [here](#).
- [Coal Mines and Coal Burning Power Plants](#) - already have a rare asset needed to develop renewable energy ... they are already connected to the grid. So when they close down, there's an opportunity to place wind/solar/storage farms promptly, and at lower cost than starting from zero. As a bonus, some of the former mine and power plant workers may find jobs at the new enterprise .. a win-win. [Example1](#), [Example2](#).
- [Alabama Power](#) - The utility's coal ash retention ponds are located on a number of sites across the state, and the utility proposes to abandon them by covering them over without sealing

the bottoms. The ponds are unlined, in contact with groundwater, and contain [millions of tons of toxic chemicals](#) ... Arsenic, Lead and Mercury. EPA is in discussions with state regulators, but has already made a [preliminary decision not to allow](#) this. Dealing with the issue properly has a price tag in the billions. It's not nice to make a deadly mess and just walk away.

- **Solar Energy for Pennsylvania's K-12 Schools** - According to a report published by [Generation180](#) titled *Powering a Brighter Future in Pennsylvania 2022*, more than 100 of the state's schools now have solar energy facilities, about 2% of the total, and one school district was producing enough solar energy to satisfy more than 90% of its power needs. New York state has double the number of schools on solar, **Maryland has triple**.
- **Rooftop Solar Leasing in Georgia** - [Georgia Bright](#) is a pilot project for installing [rooftop solar on the homes of modest income residents of Georgia](#). Credits derived from the US [Inflation Reduction Act can](#) now be directly refunded to the developer for passing on to reduce the cost of the installation, and therefore reduce the cost of the power provided. See the example given for a home in Savannah [here](#). The sponsor of Georgia Bright, The [Capital Good Fund](#) (Providence RI), wants to take the program nationwide, and the Environmental Protection Agency will be taking applications for IRA-derived funds this Spring. Looks like the sun is shining on solar.
- **First Solar (Tempe AZ)** - is the largest solar panel manufacturer in the US (uses no Silicon), and its products comply with the 2022 US Inflation Reduction Act tax benefit requirements. The [company](#) has recently:
 - **Received a 5 GW Order**: from the Israeli energy company [Energix](#) for panels delivered 2026-30. Added to existing orders, Energix expects to be running between [7 and 9 GW of First Solar panels by 2030](#). The company presently does business in Israel, Poland and the US.
 - **Received a 4 GW Order**: from [Lightsource bp](#) (San Francisco CA) for projects in the US, for delivery between 2026 and 2028. This adds to an existing order for 4.3 GW. [1 GW is power for 800,000 homes](#).
 - **Broken Ground on a 3.5 GW Factory** - in [Iberia Parish Louisiana](#): 2 million square feet, \$1.1 billion.
 - **Broken Ground on a 3.3 GW Factory** - in Tamil Nadu India. The plant will also be India's first solar panel recycling facility, and the [world's first net zero water withdrawal solar panel manufacturing plant](#) - uses tertiary-treated reverse osmosis water from a sewage treatment plant, and has zero wastewater discharge. The US International Development Finance Corporation provided \$500 million financing.
- **World's Longest Land/Sea Power Connector** - The \$2.16 billion [Viking Link](#) interconnector, with a capacity of 1.4 GW (power for 2.5 million homes) and a length of 475 miles, connects Lincolnshire UK with southern Jutland, Denmark. Wind energy from the two countries will be exchanged over this link to improve grid resilience.
- **Wooden Wind Turbine Tower** - The Swedish company [Modvion](#) (Gothenburg Sweden) has built a [492 foot wooden wind turbine tower](#), constructed in modules (easily transported by truck) assembled on site, topped by a 2MW generator now operational. The curved walls have 144 layers of laminated-veneer Spruce in 3mm layers, glued/compressed together cross-grained for additional strength - lighter than steel, some assembly required.
- **Big Solar from India** - 'Khavda Renewable Energy Park', 30 GW annually, power for 18 million homes, [280 square miles of salt desert](#) in western India's Gujarat state near Pakistan, solar and wind, [\\$2.26 billion](#), about the size of Singapore, visible from space! Coal presently generates about 70% of India's electrical power, but there's a way that may sometimes be environmentally convenient, [here](#).

- US Off-Shore Wind To Do Better in 2024 - Several off-shore wind projects on the US East coast were set aside in 2023, but are expected to be back on the table on an updated basis in 2024, [here](#). In the meantime, Dominion Energy in Virginia has announced that its \$10 billion, 2,587-MW 'Coastal Virginia Offshore Wind' project remains on budget, and on track for construction in May 2024. Likewise, Orsted plans to start offshore construction in the spring of 2024 on its \$4 billion Revolution Wind project - 704 MW for Rhode Island and Connecticut. [Harvey B.]
- Northeast Boundary Tunnel (NEBT) - is a huge, multibillion dollar stormwater runoff diversion tunnel designed to catch 98% of the stormwater/sewage mix that would otherwise be dumped directly into the Anacostia River in Washington DC. The NEBT was finally completed and [connected](#) to the DC sewage plant at Blue Plains last September. Its first big test was the recent 2.24 inch day of rain, during which the [NEBT successfully captured 267 million gallons of sewage/runoff](#) mix. Yes! Next: Rock Creek, and the Potomac waterfront. [Julian G.]
- One of the World's Largest Fish - The [Paiche](#) (Arapaima gigas) is native to Peru, but is now spreading to the Amazon basin of Bolivia as an invasive species ... possibly due to the breach of a Paiche fish farm in Peru. It's a [large fish \(up to 13 feet, 440 pounds\), surfaces to breath, and its appetite is a threat to native fish](#) - eats even piranha. [Piranha feeding frenzy](#). Now the Paiche is being eaten by the most voracious predator of all - us.
- Extinct Bird Rediscovered! - The [Dusky Tetraka](#) (Xanthomixis tenebrosa) was thought to be extinct until three individuals were [discovered in northern Madagascar in 2023](#). Photo [here](#). Welcome back little one.
- Wild Jaguars in Arizona - One was spotted recently, photo and map [here](#). They are very slowly repopulating back into their former range. The spot pattern makes each one uniquely identifiable without tagging. [John MCK]

Other Science News -

- Extreme Ultraviolet (EUV) Lithography for Chip Making - The Dutch semiconductor equipment maker [ASML](#) (Veldhoven Netherlands) has shipped its first 'High NA' EUV machine to Intel in the US. Lithography systems use lasers to create the circuitry on semiconductor chips, extreme ultraviolet lasers in this case. The goal being to achieve the smaller details needed for smaller/faster modern high density circuits - \$300 million, 250 crates including 13 shipping containers (larger than a truck), some assembly required. [Details](#).
- 67 Ancient Skeletons Discovered - in the process of excavating to build a solar power station north of Rome. Golden necklaces, jewelry and other precious items were uncovered, and archeologists are in the process of reconstructing what it all means. The [site near the ancient city of Tarquinia](#) dates to between the second and fourth centuries CE.
- Laser (LiDAR) Aero-Mapping Finds Ancient City - We had no idea that there had ever been an advanced, city-building civilization in the Amazonian area of Eastern Ecuador - like and unlike the Maya, with completely different architecture, land use, ceramics. Hidden for thousands of years! [Details](#). [Harvey B.]
- Mexico's First Moon Mission - went up on Astrobotic's Peregrine lunar lander, alongside commercial payloads. See a description of the 5 autonomous micro-robots [here](#) - 4" diameter. Update: Due to the failure of Peregrine's propulsion system after leaving orbit, Mexico's mission will not reach the moon. Do try again.
- New German Air Defense System for Ukraine - Germany has [announced](#) that its '[Oerlikon Skynex](#)' anti-air system, manufactured by Rheinmetall, has now been sent to Ukraine. The Skynex autonomous or directed guns are effective against aircraft, cruise missiles and drones at a range of up to 2.5 miles, each shoots up to 1,000 bullets per minute (cost effective munitions),

and the system consists of up to 4 shooter packages (guns), a sensor package (range 31 miles), and a command and control package - excellent [video](#) [full screen]. The system comes with a type of airburst 35 mm ammunition, each round containing 152 tungsten sub-projectiles ejected immediately in front of the oncoming target.

Nice Thing -

Gimme! Gimme! Gimme! - by ABBA as interpreted by Karolina Protsenko, [here](#). [wait out ads, stay on for other works]